Initial Study and Mitigated Negative Declaration

Good Hope–Olive Avenue Storm Drain, Stages 1 and 2 Project

Lead Agency:

Riverside County Flood Control and Water Conservation District

1995 Market Street

Riverside, CA 92501

August 2024

Prepared by:

Chambers Group, Inc.

3151 Airway Ave., Suite F208

Costa Mesa, CA 92626

THIS PAGE INTENTIONALLY LEFT BLANK

DRAFT MITIGATED NEGATIVE DECLARATION GOOD HOPE-OLIVE AVENUE STORM DRAIN, STAGES 1 AND 2 PROJECT

Lead Agency:	Riverside County Flood Control and Water Conservation District (District)
Project Proponent:	Riverside County Flood Control and Water Conservation District
Project Location:	The Project area is generally bounded by Mountain Avenue to the north, Eucalyptus Avenue to the south, Read Street to the west, Theda Street to the east, and State Route (SR) 74 to the southeast. The Project area includes Assessor Parcel Numbers (APN) 343-201-002, 343-100-006, 343-180-009, 343-230-001, 345-080-070, 345-080-071, 345-080-072, and 345-080-067. The Project is located in the U.S. Geological Survey (USGS) Steele Peak, California 7.5-minute topographic quadrangle. The Project area is located just west of SR-74 and is surrounded by rural residential homes and open fields. The elevation within the Project area ranges from 1,560 to 1,605 feet above mean sea level (amsl).

Project Description:

The Good Hope–Olive Avenue Storm Drain, Stages 1 and 2 Project (Project) consists of the construction of various storm drain infrastructure, including but not limited to reinforced concrete pipe, basin, several inlet structures and appurtenances, outlet structure, and riprap energy dissipators. Collectively, these improvements will safely convey stormwater flows to the existing box culvert located near the intersection of SR-74 and Theda Street, thereby minimizing significant surface drainage from meandering through existing residential properties during large storm events. The Project also proposes road improvements along limited sections of unpaved roadway within Read Street, Mountain Avenue, and Steele Peak Avenue.

Public Review Period: September 3, 2024 – October 3, 2024

MITIGATION MONITORING AND REPORTING PROGRAM

The Good Hope–Olive Avenue Storm Drain, Stages 1 and 2 Project

Issue	Potential Impact	Mitigation Measure	Action	Implementation Responsibility	Governing Agency	Implementation Timing
Biological Resources	Ground disturbing activities with the potential to disrupt nesting birds scheduled to occur during the nesting bird season (approximately December 15 - September 15)	**BIO-1**: Vegetation clearing shall be conducted outside of the nesting season, which is generally identified as February through August each year. If avoidance of the nesting season is not feasible, then a qualified biologist shall conduct a nesting bird survey within three days prior to any site disturbance, including disking, demolition activities, and grading. The survey shall encompass suitable habitat in the construction footprint plus a 500-foot buffer. If additional areas are proposed for disturbance, a new nesting bird survey that covers those areas shall be conducted. If nests with eggs or young are detected, the biologist shall establish suitable buffers around the nests, and the buffer areas shall be avoided until the nests are no longer occupied and the juvenile birds can survive independently from the	Preconstruction nesting bird survey	District	Riverside County Flood Control and Water Conservation District	Preconstruction- no more than three days prior to the start of construction activities.

Issue	**Potential Impact**	**Mitigation Measure**	**Action**	**Implementation Responsibility**	**Governing Agency**	**Implementation Timing**
		nests. If no active nests are detected, then no further action is required.				
	Ground disturbing activities with the potential to disrupt lands used by burrowing owls.	**BIO-2**: A pre-construction survey for burrowing owls shall be conducted within 30 days prior to ground disturbance to avoid direct impacts to the species. The survey shall encompass suitable habitat in the construction footprint plus a 500-foot buffer and follow the 2006 Burrowing Owl Survey Instructions for the Western Riverside Multiple Species Habitat Conservation Plan Area (MSHCP). If the species is detected, a Burrowing Owl Protection and Relocation Plan shall be drafted to ensure protection of the species. The plan shall include appropriate avoidance buffers, passive and/or active relocation, construction monitoring, and reporting requirements. The plan shall be reviewed and approved within 30 days of receipt by the Regional Conservation Authority (RCA) and CDFW. If the species is	Burrowing Owl Survey	District	District, RCA, and CDFW	30 days prior to ground disturbance

Issue	Potential Impact	Mitigation Measure	Action	Implementation Responsibility	Governing Agency	Implementation Timing
		not detected, then no further action is required.				
	Permanent impacts to jurisdictional resource areas	**BIO-3**: The District will obtain all appropriate regulatory permits for impacts to Regional Water Quality Control Board (RWQCB) and California Department of Fish and Wildlife (CDFW) jurisdictional areas. To mitigate for permanent impacts to jurisdictional resource areas, the District proposes to implement one of the following options: • Purchase of mitigation credits through a regulatory agency approved mitigation bank, or other off-site mitigation area at no less than a 1:1 ratio. If mitigation credits are not available at the time of construction, the District will purchase them once the mitigation bank has released them for purchase.	Work with RWQCB and CDFW during permitting to determine the final approach for mitigating the loss of jurisdictional resource areas	District	RWQCB and CDFW	Pre-Construction/ Permitting

Issue	Potential Impact	Mitigation Measure	Action	Implementation Responsibility	Governing Agency	Implementation Timing
		• Permanent impacts to unvegetated jurisdictional areas would be offset through the creation of new unvegetated jurisdictional area within the basin bottom.				
Cultural Resources	Cultural/ archaeological resources discovered during ground disturbing activities	**CUL-1**: The District shall cause for a Cultural Resources Treatment Plan (CRTP) to be developed to further outline the protocols for monitoring and management of unanticipated discoveries of cultural resources during construction. The CRTP will identify portions of the project and activities for which monitoring by a qualified Cultural monitor or Tribal Cultural monitor shall be required, due to the proximity of construction activities to Cultural Resources.	Develop CRTP	District		Pre-construction
	Cultural/ archaeological resources discovered during ground disturbing activities	**CUL-2**: Prior to commencing construction activities and thus prior to any ground disturbance in the Project area, a qualified Archaeologist or Cultural monitor shall conduct	WEAP training will educate construction personnel on how to work with the monitor(s) to identify and minimize impacts	District	District	Pre-construction

Issue	**Potential Impact**	**Mitigation Measure**	**Action**	**Implementation Responsibility**	**Governing Agency**	**Implementation Timing**
		initial Worker Environmental Awareness Program (WEAP) training for all construction personnel, including supervisors, present at the outset of the Project construction work phase. The Lead Contractor shall make their personnel available for WEAP training. A tribal monitor shall be provided with the opportunity to attend the pre-construction briefing, if requested. This WEAP training will also educate the monitor(s) of construction procedures to avoid construction-related injury or harm. This training or similar training materials may be provided periodically, as needed or for any new personnel working in the Project area.	to archaeological resources and maintain environmental compliance.			
	Cultural/ archaeological resources discovered during ground disturbing activities	**CUL-3**: If deposits of prehistoric or historical materials are encountered during project construction, all work within 50 feet of the discovery shall be halted until an archaeologist can evaluate the findings and make recommendations. A qualified archaeologist, meeting the	Stop work and assess findings in the event of an unanticipated discovery of a(n) cultural/archaeological resource	District	District	Construction

Issue	**Potential Impact**	**Mitigation Measure**	**Action**	**Implementation Responsibility**	**Governing Agency**	**Implementation Timing**
		Secretary of the Interior's Professional Qualification Standards for prehistoric and historic archaeologist, shall be retained to evaluate the significance of the find. The archaeologist shall have the authority to modify the no-work radius as appropriate, using professional judgement and in consultation with the District. ▪ If the professional archaeologist determines that the find does not represent a cultural resource, work may resume immediately, and no agency notifications are required. ▪ If the professional archaeologist determines that the find represents a cultural resource, the handling of the cultural resource(s) shall follow the applicable recommendations as described in the CRTP prepared for the Project, as required by Mitigation Measure CUL-1 and TCR-1.				

Issue	Potential Impact	Mitigation Measure	Action	Implementation Responsibility	Governing Agency	Implementation Timing
	Cultural resources or human remains discovered during ground disturbing activities	**CUL-4**: If subsurface deposits believed to be cultural in origin are discovered during construction, all work must halt within a 100-foot radius of the discovery. A qualified professional archaeologist meeting the Secretary of the Interior's Professional Qualification Standards for prehistoric and historic archaeologists shall be retained to evaluate the significance of the find. The archaeologist shall have the authority to modify the no-work radius as appropriate, using professional judgment and in consultation with the District. If the professional archaeologist determines that the find does not represent a cultural resource, work may resume immediately, and no agency notifications are required. If the professional archaeologist determines that the find represents a cultural resource, the handling of the cultural resource(s) shall follow the applicable recommendations as described in the CRTP prepared for the Project, as	Stop work and assess findings in the event of an unanticipated discovery of a(n) cultural/human resource	District	District	Construction

<u>**Issue**</u>	<u>**Potential Impact**</u>	<u>**Mitigation Measure**</u>	<u>**Action**</u>	<u>**Implementation Responsibility**</u>	<u>**Governing Agency**</u>	<u>**Implementation Timing**</u>
		required by Mitigation Measure CUL-1 and TCR-1. In the event that human remains are unearthed during excavation and grading activities, all activity shall cease immediately. Pursuant to California Health and Safety Code Section 7050.5, no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to California Public Resources Code Section 5097.98. If the remains are determined to be of Native American descent, the Coroner is required to notify the Native American Heritage Commission (NAHC) within 24 hours. The NAHC is required to contact the most likely descendant of the deceased Native American, who shall serve as consultant on how to proceed with the remains.				
Paleontological Resources	Soil disturbances resulting in destruction of paleontological resources	**PAL-1**: If paleontological resources are discovered during earth-disturbing activities, the discovery shall be cordoned off with a 50-foot	Protect the discovery from further potential damage, and a Riverside County–qualified	District	District	Construction

Issue	Potential Impact	Mitigation Measure	Action	Implementation Responsibility	Governing Agency	Implementation Timing
	underlying the Project area	radius buffer to protect the discovery from further potential damage, and a Riverside County–qualified paleontologist shall be consulted to assess the discovery. If the discovery is determined to be significant by the paleontologist, a Paleontological Resources Mitigation Program (PRMP) shall be initiated, which will include appropriate monitoring of earth disturbance activities.	paleontologist shall be consulted to assess the discovery.			
Tribal Cultural Resources	Discovery of unknown Tribal Cultural Resources (TCR) during ground disturbing activities	**TCR-1**: The District shall prepare a CRTP prior to ground disturbing activities. The CRTP shall be based on the final construction grading plans prepared by the District and may include requirements for pre-construction cultural sensitivity training, notification, and monitoring protocol. The CRTP will consider the concerns of the consulting Tribe and the consulting Tribe will have an opportunity to review and comment on the draft CRTP. In the event that the consulting Tribe is not able to reasonably accommodate the District's	Prepare CRTP	District	District	Pre-Construction

Issue	**Potential Impact**	**Mitigation Measure**	**Action**	**Implementation Responsibility**	**Governing Agency**	**Implementation Timing**
		requests and/or needs regarding monitoring, the District may proceed with Mitigation Measure TCR-2 as needed.				
	Discovery of unknown TCR during ground disturbing activities	**TCR-2**: The District may, at its discretion, conduct archeological monitoring and/or reconnaissance of the Project site using a qualified archeologist who is not a Tribal monitor or representative of a Native American Tribe. This would occur only as needed during ground-disturbing construction activities.	Use of a qualified archeologist who is not a Tribal monitor or representative of a Native American Tribe.	District	District	Construction

CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

AAQS	Ambient Air Quality Standards
AB	Assembly Bill
AQMP	Air Quality Management Plan
BMPs	Best Management Practices
CalEEMod	California Emissions Estimator Model
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CDC	California Department of Conservation
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CH4	Methane
CMP	Concrete Metal Pipe
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CNPSEI	California Native Plant Society Electronic Inventory
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
CO Plan	Federal Attainment Plan for Carbon Monoxide
CRHR	California Register of Historic Resources
CWA	Clean Water Act
DBESP	Determination of Biologically Equivalent or Superior Preservation
DPM	Diesel Particulate Matter
DTSC	Department of Toxic Substances Control
EIC	Eastern Information Center
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
EVMWD	Elsinore Valley Municipal Water District
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
GHGs	Greenhouse Gases
LEUSD	Lake Elsinore Unified School District
LUST	Leaking Underground Storage Tank
MBTA	Migratory Bird Treaty Act
MDP	Master Drainage Plan
MLD	Most Likely Descendent
MND	Mitigated Negative Declaration
MSHCP	Multiple Species Habitat Conservation Plan
NAHC	Native American Heritage Commission
ND	Negative Declaration
NEPSSA	Narrow Endemic Plant Species Survey Area
NHD	National Hydrography Dataset
NO_X	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
N_2O	Nitrous Oxide
NRCS	Natural Resources Conservation Service

NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
OEHHA	Office of Environmental Health Hazard Assessment
OHWM	Ordinary High-Water Mark
OPR	Governor's Office of Planning and Research
PM	Particulate Matter
PFYC	Potential Fossil Yield Classification
RCB	Reinforced Concrete Box
RCHCA	Riverside County Habitat Conservation Agency
RCIP	Riverside County Integrated Project
ROG	Reactive Organic Gases
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
USACE	United States Army Corps of Engineers
USFWS	United Stated Fish and Wildlife Service
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCS	Sustainable Communities Strategy
SIP	State Implementation Plan
SO2	Sulfur Dioxide
SRA	Source Receptor Area
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Toxic Air Contaminant
WEAP	Worker Environmental Awareness Program

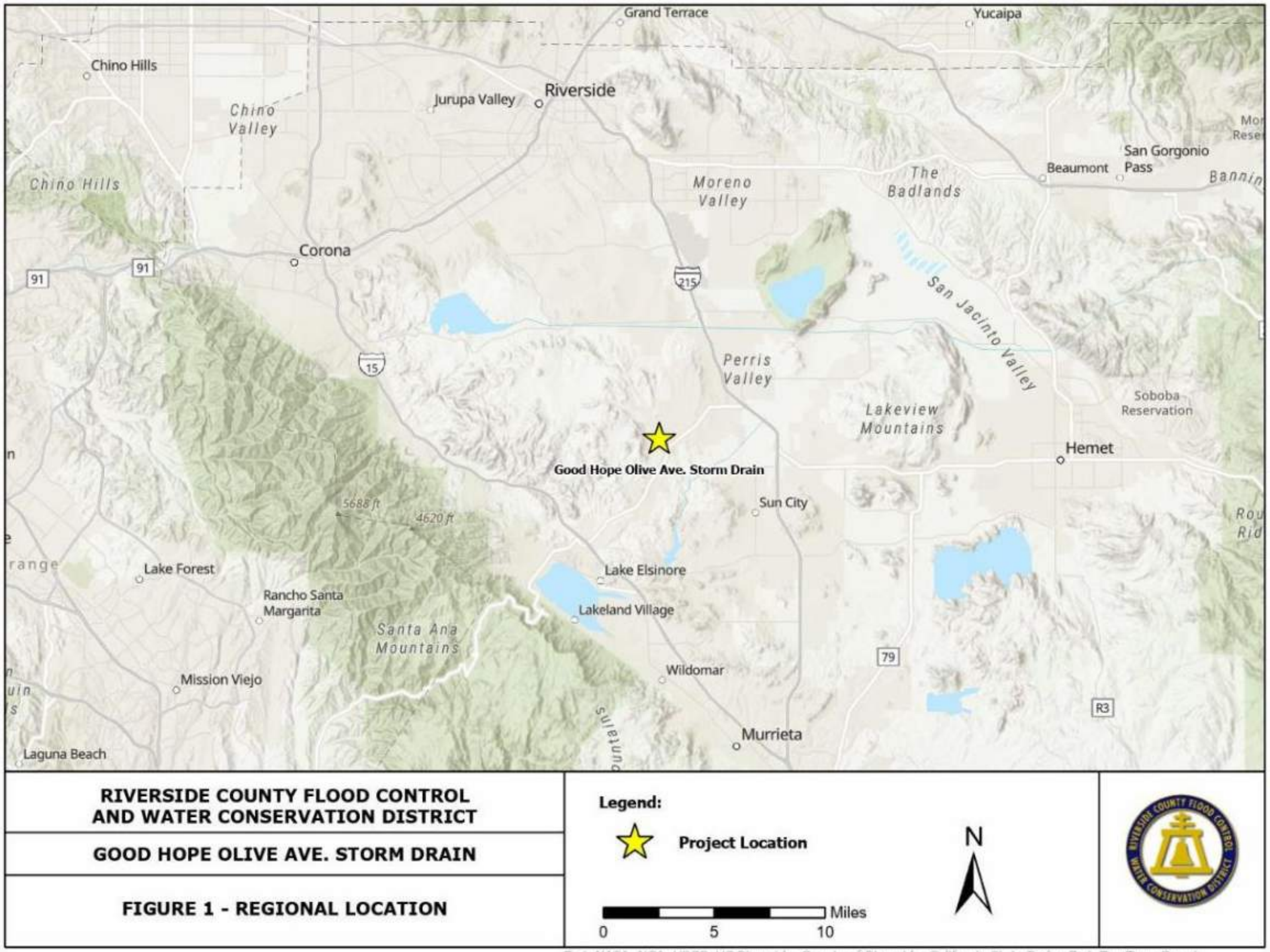
SECTION 1.0 BACKGROUND

1.1 Summary

Project Title:	Good Hope–Olive Avenue Storm Drain, Stages 1 and 2 Project No. 4-0-00425
Lead Agency Name and Address:	Riverside County Flood Control and Water Conservation District (District) 1995 Market Street Riverside, CA 92501
Contact Person and Phone Number:	Jason Swenson Environmental Project Manager 951.955.1200
Project Location:	The Good Hope–Olive Avenue Storm Drain, Stages 1 and 2 Project (Project) is located within the unincorporated community of Good Hope. The Project area is generally bounded by Mountain Avenue to the north, Eucalyptus Avenue to the south, State Highway 74 (SR-74) to the southeast, Theda Street to the east, and Read Street to the west. The Project is just southwest of the Good Hope Master Drainage Plan (MDP) limits. More specifically, the Project is in Section 3, Township 5 South, Range 4 West of the USGS Steele Peak 7.5 Minute Series Topographic Quadrangle Map. Storm Drain Areas: • Read Street between Mountain Avenue and Olympia Avenue • Steele Peak Drive between Read Street and Spring Street • Spring Street between Steele Peak Drive and Simpkins Road • Olive Avenue between SR-74 and Read Street • Olive Avenue between Quail Drive and Theda Street • Theda Street between Olive Avenue and SR-74 Street Improvements: • Read Street between Olympia Avenue and Mountain Avenue • Mountain Avenue between Baxter Street and west of Read Street • Steele Peak Drive between Baxter Street and Read Street Basin: • West of Spring Street between Olympia Avenue and Olive Avenue Inlets: • Northwest corner of Read Street and Mountain Avenue • Northwest corner of Olympia Avenue and Read Street • Northwest of Eucalyptus Avenue and Quail Drive
General Plan Designation:	• RR (Rural Residential) • RC-VLDR (Very Low Density Residential, Rural Commercial)
Zoning:	• R-R (Rural Residential)

THIS PAGE INTENTIONALLY LEFT BLANK

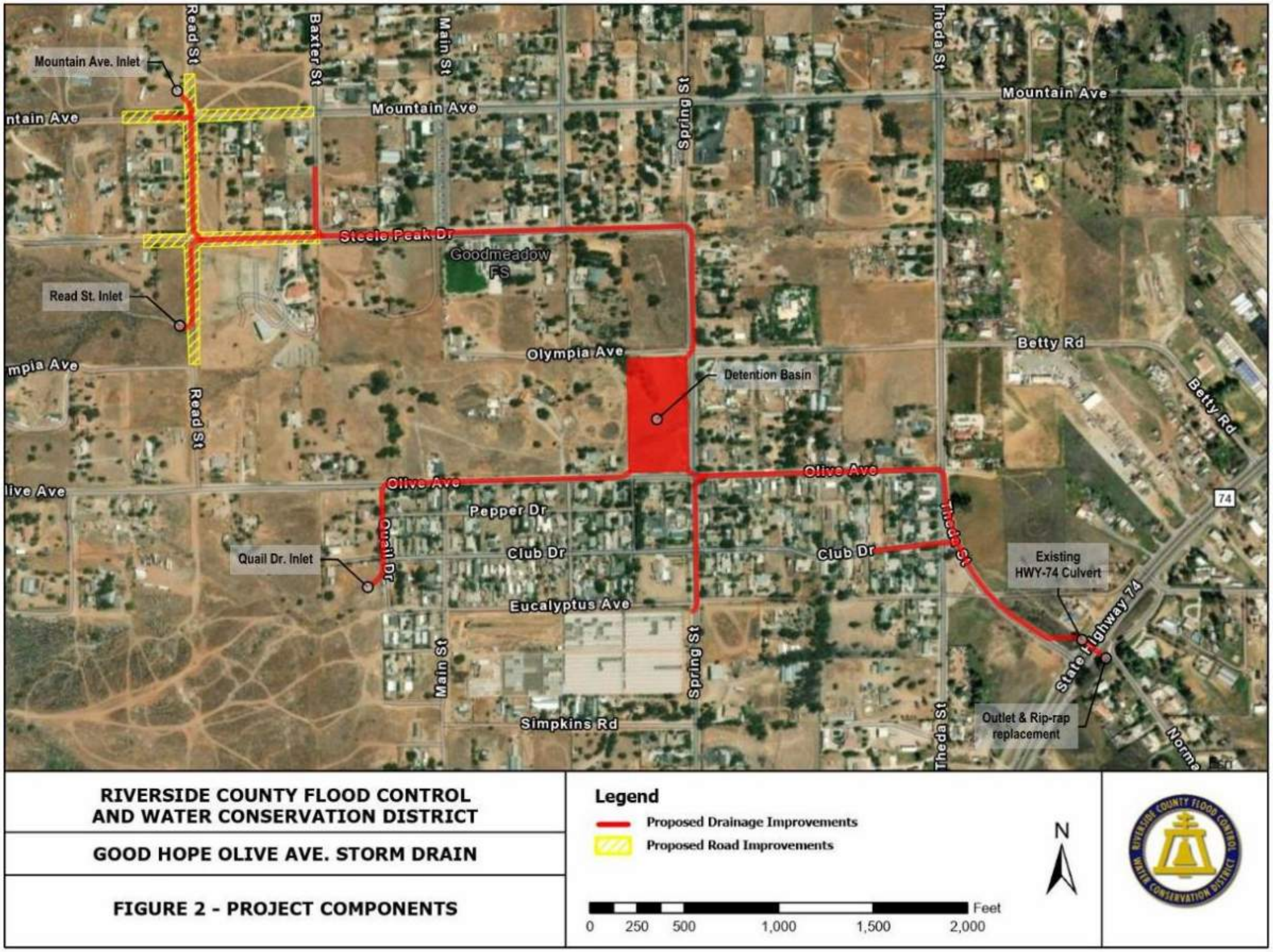
Figure 1. Regional Location



Esri, NASA, NGA, USGS, UC Riverside, County of Riverside, California State Parks, Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USFWS

THIS PAGE INTENTIONALLY LEFT BLANK

Figure 2. Project Components



THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 2.0 PROJECT DESCRIPTION

2.1 Project Purpose and Need

The Project area is located within the unincorporated community of Good Hope in Riverside County. The Project area currently has very little flood control infrastructure. Flooding in residential areas occurs during periods of heavy rain. Notable flooding during storms in 2015 and 2017 led to community members petitioning the District for flood control improvements. In response to Project area needs, the District proposes to improve drainage in the area.

The Project will be the first storm drain infrastructure project within the Project area and will alleviate identified flood issues and convey flows safely through underground storm drain infrastructure. In addition to the underground infrastructure, the inclusion of a basin will reduce the existing peak flow rates traversing downstream into private property via a natural (nonengineered) watercourse. The inclusion of road improvements in conjunction with drainage infrastructure will provide safe and more reliable access to the area for residents and emergency services.

2.2 Project Description

The Project consists of the construction, operation, and maintenance of approximately 12,500 feet (ft) of storm drains ranging in diameter from 18"–84", a detention basin, three (3) inlet structures, multiple catch basins, an outlet structure, and rock riprap energy dissipators in the Project area. Storm drains are proposed in the rights of way (ROW) of existing roads, providing 100-year flood protection to the properties between Quail Drive and Spring Street, and properties east of Spring Street and west of Theda Street between Olive Avenue and Eucalyptus Avenue. The District has also partnered with Riverside County Transportation Department (RCTD) to provide road improvements to a portion of the project area in conjunction with the installation of the underground facilities. Collectively, these improvements will safely convey stormwater flows to the existing box culvert located near the intersection of SR-74 and Theda Street, thereby eliminating significant surface drainage from meandering through existing residential properties during large storm events.

The Project will construct three (3) inlet structures at the northwest corner of Read Street and Mountain Avenue, the northwest corner of Olympia Avenue and Read Street, and northwest of Eucalyptus Avenue and Quail Road to collect storm flows from within the Project area and convey them to a detention basin at the northwest corner of Spring Street and Olive Avenue, which will then drain to the existing culvert and cross underneath SR-74. The Project will also repair and replace the existing outlet structure and riprap located at the southeast side of SR-74.

2.3 Project Design

<u>Construction</u>
The Project will construct three inlet structures at well-defined water courses in the westerly Project area. These inlets will facilitate effective capture of large flows. Such collection points have been identified at the northwest corner of the intersection of Mountain Avenue and Read Street, one along Read Street, and one along Quail Drive near Club Drive. In addition to these inlets, the Project will also construct a 5-acre detention basin at the northwest corner of the intersection of Olive Avenue and Spring Street.

The Project begins at the collection points identified above and continues generally southeasterly downstream to the Project outlet. More specifically, the Project collects stormwater flows just northwest of the intersection of Read Street and Mountain Avenue, then carries flows southerly along Read Street until meeting with another Project lateral conveying flows intercepted just west of Read Street to the south of its intersection at Steele Peak Drive. These combined flows are then conveyed easterly along Steele Peak Drive before turning south along Spring Street and eventually discharging into the basin located northwest of the Olive Avenue and Spring Street intersection.

Additionally, a major lateral is proposed at the inlet location west of Quail Drive where flows are intercepted and conveyed north in Quail Drive before turning easterly along Olive Avenue, where they continue to an outlet structure in the southeast corner of the basin. The basin facility located at the northwest corner of the Olive Avenue and Spring Street intersection will outlet metered flows underground in reinforced concrete pipe (RCP) easterly along Olive Avenue before turning southerly in Theda Street. The facility continues along Theda Street and enters private property just north of Highway 74 and connects directly to an existing double box culvert crossing SR-74 which outlets to the south. The Project will also incorporate energy dissipation techniques and slope stabilization as needed to ensure safe and effective flood conveyance to the existing culvert and natural channel located downstream of SR-74.

The Project also proposes to pave a section of 26' wide roadway within the construction area for the storm drain. The Project will pave the following roadway segments:

- Read Street – from Olympia Avenue to approx. 200' north of Mountain Avenue (approx. length of 1,500 ft.).
- Mountain Avenue – from approx. 350' west of Read Street to Baxter Street (approx. length of 1,000 ft.).
- Steele Peak Avenue – from approx. 250' west of Read Street to Baxter Street (approx. length of 1,000 ft.).

These limited road improvements will also enhance drainage through the use of dikes, area drains, and catch basins. Incidental work during construction of the road segment will include placement of signage, pavement striping/markings, driveway tie-ins, fence relocations, and minor utility adjustments.

Construction is anticipated to last for a duration of 13 months (approximately 250 working days). Construction is currently expected to begin in the third quarter of 2025 and is subject to the acquisition of applicable environmental permits. Approximately 12,200 lineal feet of various-size RCP storm drain and 140 lineal feet of 5-by-10-foot reinforced concrete box (RCB) storm drain is to be installed throughout the Project. Additionally, it is estimated that construction of the Project will result in the excavation of approximately 33,500 cubic yards, with construction of the basin producing an additional estimated 49,500 cubic yards of excavation.

The construction activities outlined above will require partial or full road closures during construction requiring implementation of a Traffic Control Plan. Several paved roadways exist for detour purposes for all phases of construction, and no construction of additional temporary paved roadways is anticipated at this time. Although construction activities for facilities owned or operated by or for a governmental agency are exempt from County Noise Ordinance 847, the District's Standard Operating Procedures limit construction between the hours of 7:00 a.m. and 3:30 p.m. Therefore, construction will still follow the most stringent noise limitations outlined for private construction projects in the County Noise Ordinance.

<u>Operation and Maintenance</u>

Operation and maintenance responsibilities will be typical of District facilities. The District will assume all maintenance roles related to underground pipes larger than 36 inches in diameter, inlet locations, the basin, including routine basin maintenance. Riverside County Transportation Department (RCTD) will maintain all catch basins and associated connector pipes smaller than 36 inches in diameter per the existing Memorandum of Understanding. Should a dual-use facility be implemented within the proposed basin site, an appropriate entity will be required to maintain any further infrastructure or improvements (turf, restrooms, baseball diamond, etc.) not specific to the operation of the basin for flood control purposes.

2.4 Project Location

The Project area is located within the unincorporated community of Good Hope in Riverside County. The Project area is generally bounded by Mountain Avenue to the north, Eucalyptus Avenue to the south, Read Street to the west, Theda Street to the east, and SR-74 to the southeast. The Project area includes Assessor Parcel Numbers (APN) 343-

201-002, 343-100-006, 343-180-009, 343-230-001, 345-080-070, 345-080-071, 345-080-072, and 345-080-067. The Project area is located in the U.S. Geological Survey (USGS) Steele Peak, California 7.5-minute topographic quadrangle. The Project area is located just west of SR-74 and is surrounded by rural residential homes and open fields. The elevation at the Project area ranges from 1,560 to 1,605 feet above mean sea level (amsl).

2.5 Project Timing

Construction of the Project would take approximately 13 months to complete. Construction is anticipated to begin in Quarter 3 of 2025 with site preparation activities and would end with returning the right-of-way to preconstruction conditions in late 2026.

2.6 Regulatory Requirements, Permits, and Approvals

The following approvals and regulatory permits may be required for implementation of the Project:

- State Water Resources Control Board: General Permit Order 2009-0009-DWQ, Storm Water Pollution Prevention Plan, and Best Management Practices
- Santa Ana Regional Water Quality Control Board, Region 8.
- California Department of Fish and Wildlife: California Fish and Game Code, Section 1602 Streambed Alteration Agreement.
- County of Riverside Transportation Department
- Southern California Air Quality Management District
- Eastern Municipal Water District

SECTION 3.0 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED AND DETERMINATION

3.1 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" as indicated by the checklist on the following pages.

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

Determination

On the basis of this initial evaluation:

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

Jason Swenson Environmental Project Manager	08/29/2024 Date

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 4.0 ENVIRONMENTAL CHECKLIST AND DISCUSSION

4.1 Aesthetics

4.1.1 Environmental Setting

Regional Setting

The Project area is located within the Good Hope community in Riverside County. Good Hope is a rural and equestrian-oriented community in the southwestern portion of the Mead Valley Area Plan. The planning area is located north of the Elsinore and Sun City/Menifee Valley Area Plans in Riverside County.

The Mead Valley Area Plan provides land use guidelines for a predominantly rural community with an equestrian focus as reflected by its Very Low-Density Residential and Low-Density Residential land use designations. The Project area is relatively flat and has an average elevation of 1,576 feet amsl. The surrounding land includes the Temescal Mountains to the west; residential homes surround the rest of the Project area. Land uses include rural residential neighborhoods, disturbed non-native grasslands, open fields, dirt roads, and paved roads.

The area covered by the Mead Valley Area Plan contains pockets of open spaces, including the Motte Rimrock Reserve and Steele Peak, which are designated open space conservation habitats to preserve their scenic and natural qualities. Areas with the land use designation of Conservation (C) and Rural (RUR) have or recommend protection of its open spaces, including scenic resource preservation.

4.1.2 Aesthetics (I) Environmental Checklist and Discussion

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

The Project area is located within the Mead Valley Area Plan (MVAP) as designated in the Riverside County General Plan (County 2018). While the MVAP identifies rural areas to be protected for their scenic quality, the Project area does not contain any scenic vistas or resources that contain quality scenic value. The MVAP calls out three areas with distinctive features: Gavilan Hills, Steele Peak, and Motte Rimrock Reserve (County 2018). The Project area is in a rural community within undeveloped and underdeveloped parcels. The surrounding areas include a mixture of vacant parcels and private properties. The Project area is not located within these unique features of the planning area.

Construction activities would be temporary, and the Project does not include construction of any buildings that could create a permanent disruption to the existing views, it is not anticipated the construction and operational activities would affect a scenic vista. Construction impacts would be temporary. The Project would not have an adverse effect on a scenic vista; no impact would occur.

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

A portion of the Project would be located adjacent to SR-74, which is designated as an Eligible Route per Caltrans and the MVAP (County 2015; Caltrans 2023). While a portion of the Project area would occur adjacent to an eligible route, the Project itself does not propose any highway improvements and, therefore, no impact is anticipated to a state scenic highway. Furthermore, the Project area does not contain any historic buildings or rock outcroppings that would be impacted. While trees are scattered throughout the Project area, the proposed improvements would include minimal tree removal activities focused on ornamental trees. No impact would occur.

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

Please see the response to question 4.1.2 a) above. Construction-related activities, such as excavating, stockpiling of materials, and equipment storage could result in temporary impacts to the visual character of the Project area. However, visual disturbances to the Project area would be short-term and would cease once construction is completed. The Project area consists of varied and sparse development. The proposed activities are focused on storm drain and inlet improvements along with a basin construction, neither of which would require construction of free-standing buildings that could affect the public view of the surrounding area. After the completion of construction, the Project area, including areas within street ROWs, would be restored to preconstruction conditions. Therefore, the long-term visual character of the Project area and surrounding areas would not be degraded because of the Project. A less than significant impact would occur.

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

Existing light sources within the Project area are primarily from the existing residences and include streetlamp posts, front yard outdoor lighting, and vehicle lights. Lighting along SR-74 includes some streetlights and primarily vehicle lights. Portions of the Project may occur within or below the street ROWs. The Project would not create new sources that would adversely affect nighttime views because it would not involve construction of buildings that would create a permanent light and glare source to the area once developed. Construction of the Project would not occur outside of the County's code (construction does not occur between the hours of 6:00 P.M. and 6:00 A.M. during June through September, and 6:00 P.M. and 7:00 A.M. during October through May). Once constructed, the proposed maintenance activities would occur during daylight hours (7:00 A.M. to 5:00 P.M.) per the District's standard operating procedures. Therefore, because the construction, operation, and maintenance of the Project would not introduce substantial light and glare to the area, no impact would occur.

4.1.3 Mitigation Measures

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

4.2 Agriculture and Forestry Resources

4.2.1 Environmental Setting

The Farmland Mapping and Monitoring Program (FMMP) administered by the California Department of Conservation (DOC) produces maps and statistical data to analyze impacts on California's agricultural resources. Agricultural land is rated according to soil quality and irrigation status.

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

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

According to the MVAP, the Project area's land uses are designated as Very Low Density Residential. Properties within this zone permit single-family residences, limited agriculture, intensive equestrian, and animal keeping uses (County 2018). According to the DOC FMMP maps, the Project area has a variety of farmland designations, including Urban and Built-Up Land, Other Land, Grazing Land, and Farmland of Local Importance (DOC 2022). While portions of the Project are permitted for farm uses, the Project would not result in converting land to nonagricultural or nonfarming uses. The Project will update the existing storm drains and inlets and construct a basin to provide flood infrastructure within the Project area. Completion of these improvements would involve future maintenance of these areas. The Project does not include any land use changes or construction of buildings that would create new uses to the area, and it would not convert lands to non-agricultural uses, therefore no impacts would occur.

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

According to the DOC's Williamson Map, most lands that are part of the Williamson Act contract are in central California. The Project area is not located on or nearby lands that are subject to Williamson Act contracts (DOC 2016). Therefore, the Project would not result in a conflict with existing zoning for agricultural uses or a Williamson Act Contract. No impact would occur.

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

The Project area is relatively flat, with rural residential neighborhoods consisting of disturbed non-native grasslands, open fields, dirt roads, and paved roads. The Project area and its immediate surroundings do not contain any lands that are designated for timberland production. Therefore, the Project would not conflict with existing zoning or cause for rezoning of forest land, timberland, or timberland zoned for timberland production. No impact would occur.

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

Please see the response to question 4.2.2 c) above. There are no proposed activities or construction related to forest lands. No impact would occur.

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

The Project area and the surrounding properties are zoned and permitted for single-family, equestrian, and light agricultural uses. The Project does not involve any land uses changes that would result in converting the lands to non-forest uses. The Project focuses on constructing flood improvements to the neighborhood to improve drainage to the area as a response to public petition. No impact would occur.

4.2.3 Mitigation Measures

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

4.3 Air Quality

4.3.1 Environmental Setting

An Air Quality and Greenhouse Gas Assessment has been performed for the Project. The California Air Resources Board (CARB) divides the state into air basins that share similar meteorological and topographical features. The Project site is located in the unincorporated community of Good-Hope in western Riverside County within the South Coast Air Basin (SCAB). SCAB includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties. The air basin is on a coastal plain with connecting broad valleys and low hills and is bounded by the Pacific Ocean on the southwest, with high mountains forming the remainder of the perimeter. The mountain ranges to the east affect the diffusion of pollutants by inhibiting the eastward transport of pollutants. Air quality within the SCAB region generally ranges from fair to poor and is similar to air quality in most of coastal Southern California. The entire region experiences heavy concentrations of air pollutants during prolonged periods of stable atmospheric conditions.

Both the U.S. Environmental Protection Agency (EPA) and CARB have established Ambient Air Quality Standards (AAQS) for common pollutants. These AAQS are levels of contaminants representing safe levels that avoid specific adverse health effects associated with each pollutant. The ambient air quality standards cover what are called "criteria" pollutants because the health and other effects of each pollutant are described in criteria documents. The six criteria pollutants are ozone (O_3) (precursor emissions include nitrogen oxide [NOx] and reactive organic gases [ROG], carbon monoxide (CO), particulate matter less than 10 µm in diameter (PM_{10}), particulate matter less than 2.5µm in diameter ($PM_{2.5}$) nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead. Areas that meet ambient air quality standards are classified as attainment areas, while areas that do not meet these standards are classified as nonattainment areas. The SCAB region is designated as a nonattainment area for the federal O_3 and $PM_{2.5}$ standards and is also a nonattainment area for the state standards for O_3, PM_{10}, and $PM_{2.5}$.

4.3.2 Regulatory Setting

The South Coast Air Quality Management District (SCAQMD) is the air pollution control agency for Orange County and the urban portions of Los Angeles, Riverside, and San Bernardino Counties. The agency's primary responsibility is ensuring that the federal and State AAQS are attained and maintained within the SCAB region. The SCAQMD is also responsible for adopting and enforcing rules and regulations concerning air pollutant sources; issuing permits for stationary sources of air pollutants; inspecting stationary sources of air pollutants; responding to citizen complaints; monitoring ambient air quality and meteorological conditions; awarding grants to reduce motor vehicle emissions; and conducting public education campaigns, as well as many other activities. All projects are subject to SCAQMD rules and regulations in effect at the time of construction.

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

- Rule 402 (Nuisance) – This rule prohibits the discharge from any source whatsoever such quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or that endanger the comfort, repose, health, or safety of any such persons or the public, or that cause, or have a natural tendency to cause injury or damage to business or property. This rule does not apply to odors emanating from agricultural operations necessary for the growing of crops or the raising of fowl or animals.
- Rule 403 (Fugitive Dust) – This rule requires fugitive dust sources to implement best available control measures for all sources and prohibits all forms of visible PM from crossing any property line. This rule is intended to reduce PM_{10} emissions from any transportation, handling, construction, or storage activity that has the potential to generate fugitive dust. PM_{10} suppression techniques are summarized below.

  1) Portions of a construction site to remain inactive longer than a period of three months will be seeded and watered until grass cover is grown or otherwise stabilized.
  2) All on-site roads will be paved as soon as feasible or watered periodically or chemically stabilized.
  3) All material transported off-site will be either sufficiently watered or securely covered to prevent excessive amounts of dust.
  4) The area disturbed by clearing, grading, earthmoving, or excavation operations will be minimized at all times.
  5) Where vehicles leave a construction site and enter adjacent public streets, the streets will be swept daily or washed down at the end of the workday to remove soil tracked onto the paved surface.

4.3.3 Air Quality (III) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

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

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

As previously mentioned, the Project area is located within the SCAB region, which is under the jurisdiction of the SCAQMD. The SCAQMD is required, pursuant to the federal CAA, to reduce emissions of criteria pollutants for which the SCAB region is in nonattainment for. To reduce such emissions, the SCAQMD drafted the 2022 Air Quality Management Plan (AQMP). The 2022 AQMP establishes a program of rules and regulations directed at reducing air pollutant emissions and achieving state and national air quality standards. The 2022 AQMP is a regional, multiagency effort of the SCAQMD, CARB, the Southern California Association of Governments (SCAG), and the EPA. The AQMP's pollutant control strategies are based on the latest scientific and technical information and planning assumptions, including SCAG's 2020 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), updated emission inventory methodologies for various source categories, and SCAG's latest growth forecasts (SCAG's latest growth forecasts were defined in consultation with local governments and with reference to local general plans). The Project is subject to the SCAQMD's AQMP.

According to the SCAQMD, to determine consistency with SCAQMD's air quality planning, two main criteria must be addressed.

Criterion 1

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

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

Given that the consistency criteria identified under the first criterion pertains to pollutant concentrations rather than to total regional emissions, an analysis of the Project's pollutant emissions relative to localized pollutant concentrations is used as the basis for evaluating the Project's consistency. As shown in Table 3, localized concentrations of CO, NOx, and $PM_{2.5}$ would be below the established thresholds for each criteria pollutant; thus, impacts would be less than significant. Therefore, the Project would not result in an increase in the frequency or severity of existing air quality violations. Because ROG is not a criteria pollutant, no ambient standard or localized threshold exists for ROG. Due to the role it plays in O_3 formation, ROG is classified as a precursor pollutant, and only a regional emissions threshold has been established.

b) Would the project cause or contribute to new air quality violations?

As shown in Table 1, the Project would result in regional emissions that would be below the SCAQMD regional thresholds during both construction and operation. Therefore, the Project would not have the potential to cause or affect a violation of the AAQS.

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

The Project would result in less than significant impacts regarding localized concentrations during Project construction. As such, the Project would not delay the timely attainment of air quality standards or AQMP emissions reductions.

Criterion 2

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

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

A project is consistent with regional air quality planning efforts in part if it is consistent with the population, housing, and employment assumptions used in the development of the SCAQMD air quality plans. Generally, three sources of data form the basis for the projections of air pollutant emissions: The County of Riverside General Plan, SCAG's Growth Management Chapter of the Regional Comprehensive Plan and Guide (RCPG), and SCAG's 2020 RTP/SCS. The RTP/SCS also provides socioeconomic forecast projections of regional population growth. The Project involves the improvement of stormwater drainage and flood protection facilities, which are not a trip-generating land use. Rather, the Project will address existing stormwater management deficiencies and implement improvements consistent with Riverside County's General Plan to protect life and property by improving existing flood protection barriers. Therefore, the Project would be considered consistent with the General Plan. Furthermore, the Project does not involve any uses that would increase population beyond what is considered in the General Plan and, therefore, would not affect local plans for population growth. Thus, the Project is consistent with the types, intensity, and patterns of land use envisioned for the Project vicinity in the RCPG. The population, housing, and employment forecasts, which were adopted by SCAG's Regional Council, are based on the local plans and policies applicable; these are used by SCAG in all phases of implementation and review. Additionally, as the SCAQMD has incorporated these same projections into the 2022 AQMP, it can be concluded that the Project would be consistent with the projections.

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

The Project would result in less than significant air quality impacts. Compliance with emission reduction measures identified by the SCAQMD, such as SCAQMD Rules 402 and 403, described in the Regulatory Framework subsection above, are required for all projects in the SCAB region. Additionally, the Project requires the use of construction equipment of advanced efficiency. As such, the Project meets this consistency criterion.

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

The Project would serve to implement regional goals to improve stormwater management within the Project area. The Project is located adjacent to developed portions of the Project area and is proposing structural improvements to flood control facilities. Therefore, the Project would be consistent with land use planning strategies set forth by the SCAQMD air planning efforts.

In conclusion, the determination of AQMP consistency is primarily concerned with the long-term influence of a project on air quality. The Project would not result in a long-term impact on the region's ability to meet state and federal air quality standards. The Project's long-term influence would also be consistent with the goals and policies of the SCAQMD's 2022 AQMP. Therefore, the Project would not conflict with or obstruct implementation of SCAQMD's 2022 AQMP. Impacts would be less than significant.

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

Construction

Regional Construction Significance Analysis

Construction associated with the Project would generate short-term emissions of criteria air pollutants. The criteria pollutants of primary concern within the Project area include O_3-precursor pollutants (i.e., ROG and NOx) and PM_{10} and $PM_{2.5}$. Construction-generated emissions are short term and of temporary duration, lasting only as long as construction activities occur, but would be considered a significant air quality impact if the volume of pollutants generated exceeds the SCAQMD's thresholds of significance.

Construction would result in the temporary generation of emissions resulting from site excavation, Project construction, and paving. Motor vehicle exhaust is associated with construction equipment and worker trips. PM is associated with the movement of construction equipment, especially on unpaved surfaces. Emissions of airborne PM are largely dependent on the amount of ground disturbance associated with site preparation activities, as well as weather conditions and the appropriate application of water.

The Project would require the net export of approximately 81,038 cubic yards of soil. See Appendix A for more information regarding the construction assumptions, including construction equipment and duration, used in this analysis.

Construction-generated emissions associated with the Project were calculated using the CARB-approved CalEEMod Version 2022.1 computer program, which is designed to model emissions for land use development projects based on typical construction requirements; model outputs are provided in Attachment A. Because there are no input fields in CalEEMod to capture additional fugitive dust emissions from excavation/trenching related to this Project, additional calculations were performed and added to the CalEEMod emission totals to generate total construction-related emissions. The additional excavation/trenching fugitive dust totals are shown in Table 1; calculations are presented in Attachment B of Appendix A. Predicted maximum daily construction-generated emissions for the Project are summarized in Table 1. The calculated excavation/trenching emissions were added to the maximum pound per day emissions from CalEEMod to generate the maximum total emissions shown in Table 1. Actual construction of the Project would be dictated by several regulatory forces. As such, if construction starts at a later date, it can be expected that Project's emissions would be reduced because CalEEMod incorporates lower emission factors associated with construction equipment in future years due to improved emissions controls and fleet modernization through turnover.

Table 1 - Construction-Related Emissions (Regional Significance Analysis)

Table 1 Construction-Related Emissions (Regional Significance Analysis) Emissions Source	Pollutant (pounds per day)					
	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
2025 CalEEMod Max Daily	3.12	35.8	30.0	0.11	4.76	2.03
2026 CalEEMod Max Daily	1.23	9.46	14.8	0.03	0.67	0.43
2027 CalEEMod Max Daily	1.69	8.92	14.3	0.03	0.64	0.40

Table 1 Construction-Related Emissions (Regional Significance Analysis) Emissions Source	**Pollutant (pounds per day)**					
	ROG	**NOx**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Excavation/Trenching Emissions	—	—	—	—	0.61	0.31
Total Maximum Daily Emissions	3.12	35.8	30.0	0.11	5.37	2.34
SCAQMD Potentially Significant Impact Threshold	75	100	550	150	150	55
Exceeds SCAQMD Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Source: CalEEMod version 2022.1. Refer to Attachment A for Model Data Outputs.

Notes: The reduction/credits for construction emissions are based on measures included in CalEEMod and as required by the SCAQMD through Rule 403. This includes the following: properly maintain mobile and other construction equipment; replace ground cover in disturbed areas quickly; water exposed surfaces three times daily; cover stockpiles with tarps.

As shown in Table 1, emissions generated during Project construction would not exceed the SCAQMD's regional thresholds of significance. Therefore, criteria air pollutant emissions generated during Project construction would not result in a cumulatively considerable net increase of any criteria pollutants for which the Project region is in nonattainment under an applicable federal or state ambient air quality standard.

Localized Construction Significance Analysis

The nearest sensitive receptors to the Project area are the adjacent residences. To identify impacts to sensitive receptors, the SCAQMD recommends addressing localized significance thresholds (LSTs) for construction. LSTs were developed in response to the SCAQMD Governing Board's Environmental Justice Enhancement Initiative (I-4). The SCAQMD provided the *Final Localized Significance Threshold Methodology* (Methodology; dated June 2003; revised 2008) for guidance. The LST methodology assists lead agencies in analyzing localized impacts associated with a project.

The Project area is within the Perris Valley Source Receptor Area (SRA) for LSTs. LSTs apply to CO, NO_2, PM_{10}, and $PM_{2.5}$. As previously described, the SCAQMD has produced look-up tables for projects that disturb less than or equal to five acres daily. The SCAQMD has also issued guidance on applying the CalEEMod emissions software to LSTs for projects greater than five acres. Since CalEEMod calculates construction emissions based on the number of equipment hours and the maximum daily soil disturbance activity possible for each piece of equipment, Table 2 is used to determine the maximum daily disturbed acreage for comparison to LSTs.

Table 2 - Equipment-Specific Grading Rates

Table 2 Equipment-Specific Grading Rates Construction Phase	Equipment Type	Equipment Quantity	Acres Graded/ Disturbed per 8-Hour Day	Operating Hours per Day	Acres Graded per Day
Site Preparation	Bore/Drill rigs	1	0	8	0
				Total	**0**
Site Grading	Crawler tractors	2	0.5	8	1
	Excavators	2	0	8	0
	Graders	1	0.5	8	0.5
	Rubber-tire loaders	1	0.5	8	0.5
	Scrapers	2	1	8	2
				Total	**4**
Project Construction	Excavators	1	0	8	0
	Rubber-tire loaders	2	0.5	8	1
	Signal boards	2	0	8	0
	Tractors/Loaders/Backhoes	1	0.5	8	0.5
	Pumps	1	0	8	0
				Total	**1.5**
Paving and Site Cleanup	Pavers	1	0	8	0
	Rollers	3	0	8	0
	Skid steer loaders	1	0	8	0
	Tractors/Loaders/Backhoes	1	0.5	8	0.5
				Total	**0.5**
Maximum Total Acres Graded per Day					**4**

As shown in Table 2, Project implementation will disturb up to four acres daily. Therefore, for a conservative analysis, the LST threshold value for a five-acre construction was sourced from the LST lookup tables.

The nearest sensitive receptors to the Project area are the adjacent residences. LST thresholds are provided for distances to sensitive receptors of 25, 50, 100, 200, and 500 meters. Notwithstanding, the SCAQMD Methodology explicitly states: "It is possible that a project may have receptors closer than 25 meters. Projects with boundaries located closer than 25 meters to the nearest receptor should use the LSTs for receptors located at 25 meters." Therefore, LSTs for receptors located at 25 meters were utilized in this analysis.

The SCAQMD's methodology states that "off-site mobile emissions from a project should not be included in the emissions compared to LSTs." Therefore, for purposes of the construction LST analysis, only emissions included in the CalEEMod on-site emissions outputs were considered. In addition, the supplemental particulate matter emissions from excavation/trenching calculations were added to the Site Grading and Project Construction phases because these are the phases when excavation and trenching are occurring. Table 3 presents the results of localized emissions during construction activity. The LSTs reflect a maximum disturbance of five acres daily at 25 meters for the Project.

Table 3 - Construction-Related Emissions (Localized Significance Analysis)

Table 3. Construction-Related Emissions (Localized Significance Analysis)

Activity	Pollutant (pounds per day)			
	NOx	CO	PM10	PM2.5
Site Preparation	1.28	2.38	0.04	0.03
Site Grading	25.0	25.1	2.80	1.52
Project Construction	9.99	13.3	1.04	0.71
Paving and Site Cleanup	5.86	8.45	0.23	0.21
SCAQMD Localized Screening Threshold (Adjusted for five 5 acres of disturbance at 25 meters)	270	1,577	13	8
Exceed SCAQMD Threshold?	**No**	**No**	**No**	**No**

Source: CalEEMod version 2022.1. Refer to Attachment A for Model Data Outputs.
Notes: The reduction/credits for construction emissions are based on measures included in CalEEMod and as required by the SCAQMD through Rule 403. This includes the following: properly maintain mobile and other construction equipment; replace ground cover in disturbed areas quickly; water exposed surfaces three times daily; cover stockpiles with tarps.

As shown in Table 3, emissions of these pollutants on the peak day of construction would not result in significant concentrations of pollutants nearby sensitive receptors. While impacts are considered less than significant, the Project is still subject to SCAQMD Rules 402 and 403, described in the Regulatory Setting subsection above, to reduce specific construction-related emissions.

Operation

Regional Operational Significance Analysis

The Project involves the development of the Good Hope–Olive Avenue Storm Drain. The Project will not include the provisions of new permanent stationary or mobile sources of emissions and vehicle trips to the Project area because maintenance would be minimal. Therefore, regional operational emissions would result in a less than significant long-term regional air quality impact.

Localized Operational Significance Analysis

According to the SCAQMD Localized Significance Threshold methodology, LSTs would apply to the operational phase of a project only if the project includes stationary sources or attracts mobile sources that may spend long periods queuing and idling at the site (e.g., warehouse or transfer facilities). The Project does not include such uses. Therefore, in the case of the Project, the operational-phase LST protocol does not need to be applied.

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

Sensitive receptors are defined as facilities or land uses that include members of the population who are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of these sensitive receptors are residences, schools, hospitals, and daycare centers. CARB has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over 65; children under 14; athletes; and persons with cardiovascular and chronic respiratory diseases, such as asthma, emphysema, and bronchitis.

Construction-Generated Air Contaminants

Construction-related activities would result in temporary, short-term, Project–generated emissions of diesel particulate matter (DPM) from the exhaust of off-road, heavy-duty diesel equipment for site preparation (e.g., clearing, grading), soil hauling truck traffic, paving, and other miscellaneous activities. For construction activity, DPM is the primary toxic air contaminant (TAC) of concern. Particulate exhaust emissions from diesel-fueled engines (i.e., DPM) were identified as a TAC by CARB in 1998. The potential cancer risk from the inhalation of DPM, as discussed below, outweighs the potential for all other health impacts (i.e., noncancer chronic risk, short-term acute risk) and health impacts from other TACs. Accordingly, DPM is the focus of this discussion.

Based on the emission modeling conducted, the maximum mitigated construction-related annual emissions of $PM_{2.5}$ exhaust, considered a surrogate for DPM, would be 0.03 pounds per day during site preparation, 1.1 pounds per day during site grading, 0.21 pounds per day during construction, and 0.25 pounds per day during paving and site cleanup (see Attachment A). $PM_{2.5}$ is considered a surrogate for DPM because more than 90 percent of DPM is less than one microgram in diameter and, therefore is a subset of particulate matter under 2.5 microns in diameter (i.e., $PM_{2.5}$). Most $PM_{2.5}$ derives from combustion, such as use of gasoline and diesel fuels by motor vehicles (CARB, 2023). Furthermore, even during the most intense month of construction, emissions of DPM would be generated from different locations at the Project area rather than at a single location because different types of construction activities (e.g., demolition, site preparation, building construction) would occur at separate times and places.

The dose to which receptors are exposed is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for any exposed receptor. Thus, the risks estimated for an exposed individual are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment, health risk assessments, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 70-, 30-, or 9-year exposure period; further, such assessments should be limited to the period/duration of activities associated with the Project. Consequently, an important consideration is the fact that construction of the Project is not anticipated to last 9 consecutive years, the minimum duration of exposure from which to calculate health risk. Project construction is anticipated to last approximately 13 months. Furthermore, on a day-to-day basis, construction activity generally spans eight hours as opposed to throughout the entire day.

Therefore, considering the relatively low mass of DPM emissions that would be generated during even the most intense season of construction and the fact that construction would not last as long as the minimum duration of exposure from which to calculate health risk, construction-related TAC emissions would not expose sensitive receptors to substantial amounts of air toxics.

Furthermore, the Project has been evaluated against the SCAQMD's Localized Significance Thresholds (LSTs) for construction. As previously stated, LSTs were developed in response to the SCAQMD Governing Board's Environmental Justice Enhancement Initiative (I-4) and can be used to assist lead agencies in analyzing localized impacts associated with Project–specific level. As shown in Table 3, the emissions of pollutants on the peak day of construction would not result in significant concentrations of pollutants at nearby sensitive receptors.

Operational Air Contaminants

Operation of the Project would not result in the development of any substantial sources of air toxics. There are no stationary sources associated with the operations of the Project. Nor would the Project attract mobile sources that spend long periods queuing and idling at the site. Therefore, the Project would not be a source of TACs.

Carbon Monoxide Hot Spots

It has long been recognized that CO exceedances are caused by vehicular emissions, primarily when idling at intersections. Concentrations of CO are a direct function of the number of vehicles, length of delay, and traffic flow conditions. Under certain meteorological conditions, CO concentrations close to congested intersections experiencing high levels of traffic and elevated background concentrations may reach unhealthy levels, affecting nearby sensitive receptors. Given the high traffic volume potential, areas of high CO concentrations, or hot spots, typically are associated with intersections projected to operate at unacceptable levels of service (LOS) during the peak commute hours. However, transport of this criteria pollutant is extremely limited, and CO disperses rapidly with distance from the source under normal meteorological conditions. Furthermore, vehicle emissions standards have become increasingly more stringent in the last 20 years. Currently, the CO standard in California is a maximum of 3.4 grams per mile for passenger cars (requirements for certain vehicles are more stringent). With the turnover of older vehicles, introduction of cleaner fuels, and implementation of control technology on industrial facilities, CO concentrations in the Project vicinity have steadily declined.

The Project would not generate any new traffic trips during operation, and average daily trips would be the same with and without Project implementation. Because the Project would not generate any new traffic trips during operation, there is no likelihood of the Project creating traffic which would create new hotspots or contribute substantially to existing hotspots.

Odors

Typically, odors are regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory, and respiratory effects, nausea, vomiting, and headache).

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

Construction

During construction, the Project presents the potential for generation of objectionable odors in the form of diesel exhaust in the immediate vicinity of the Project area. However, these emissions are short-term in nature and would rapidly dissipate and be diluted by the atmosphere downwind of the emission sources. Additionally, odors would be localized and generally confined to the construction area.

Operation

The SCAQMD CEQA Air Quality Handbook (1993) identifies certain land uses as sources of odors. These land uses include agriculture (farming and livestock), wastewater treatment plants, food processing plants, chemical plants, composting facilities, refineries, landfills, dairies, and fiberglass molding facilities. The Project would not include any of the land uses that have been identified by the SCAQMD as odor sources. Impacts would be less than significant.

4.3.4 Mitigation Measures

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

4.4 Biological Resources

A Habitat Assessment (HA) and Jurisdictional Delineation (JD) was prepared by Psomas for the Project (Appendix B). An updated Jurisdictional Delineation was also prepared by Chambers Group which superseded the original JD and is provided in Appendix C. The purpose of the HA is to inventory sensitive biological resources within the Project area. The purpose of the JD is to delineate the potential waters and wetlands that occur within and/or immediately adjacent to the Project area.

4.4.1 Environmental Setting

The Project area is relatively flat and has an average elevation of 1,576 feet amsl. The surrounding land features include the Temescal Mountains to the west and residential homes, nurseries, and developments surrounding the rest of the Project area. Land uses present in the Project vicinity include open space, residential, rural residential, agricultural, and transportation.

Seven vegetation communities were determined to occur within the Project area, including Riversidean Sage Scrub/Non-Native Grasslands, Black Willow-Red Willow Thickets, Disturbed Black Willow-Red Willow Thickets, Disturbed California Buckwheat Scrub, Non-Native Disturbed/Ruderal, Exotic/Ornamental, and Disturbed/Dirt Roads. Maps of the vegetation communities present onsite and a complete list of plant species observed during the biological survey has been provided in Appendix C.

The JD determined that none of the soils present within the Project area are classified as hydric soils and therefore no wetlands are present onsite. This includes the area within an isolated swale feature and adjacent to (outside of) the Project near Drainage 3. The Project site contains thirteen soil types (Appendix B):

- Cajalco fine sandy loam (CaC2), 2 to 8 percent slopes and Cajalco fine sandy loam (CaD2), 8 to 15 percent slopes
- Cieneba rocky sandy loam (CkF2), 15 to 50 percent slopes
- Escondido fine sandy loam (EcC2), 2 to 8 percent slopes
- Fallbrook fine sandy loam (FfC2), 2 to 8 percent slopes and Fallbrook fine sandy loam (FkD2), shallow, 8 to 15 percent slopes
- Friant fine sandy loam (FwE2), 5 to 25 percent slopes,
- Hanford coarse sandy loam (HcC), 2 to 8 percent slopes
- Monserate sandy loam (MmD2), 8 to 15 percent slopes and Monserate sandy loam (MmD2), 8 to 15 percent slopesTerrace escarpments (TeG)
- Yokohl loam (YbC), 2 to 8 percent slopes
- Ysidora gravelly very fine sandy loam (YsC2), 2 to 8 percent slopes

ANALYSIS OF MSHCP 6.1.2 RIPARIAN/RIVERENE RESOURCES

Three ephemeral drainages were identified to occur within the Project area and which contain a defined channel bed and bank. The Project impact area does not contain riparian habitat and does not provide suitable habitat for the riparian birds listed in Section 6.1.2 of the MSHCP (Psomas, 2019). Additionally, no suitable habitat was identified within the Project impact area that would support vernal pools or fairy shrimp (Psomas, 2019). A total of 0.071 acre of unvegetated streambeds was mapped within the Project impact area. The unvegetated streambeds do not meet the MSHCP definition of Riverine as they have no connectivity to downstream MSHCP Conservation areas and, therefore, do not contribute to the biological functions and values of downstream habitat for covered species within the MSHCP Conservation Area. Additionally, species listed in Section 6.1.2 of the MSHCP are not present and are not expected to occur within the Project area. For these reasons, the District, as a Permittee to the MSHCP, has determined that a Determination of Biologically Equivalent or Superior Preservation (DBESP) is not warranted for this Project.

Drainage 1

Drainage 1 is located south of Steele Peak Avenue and east of Read Street. Drainage 1 is a mapped National Hydrography Dataset (NHD) ephemeral feature within the Project boundary. The drainage receives flow from the surrounding mountains to the west of the property. The portion of the drainage within the Project area (west of Reed Street) is composed of various vegetation communities including Riversidean Sage Scrub/Non-native Grassland, as well as non-native vegetation, including brome, glaucous foxtail barley, and shortpod mustard, within the channel. No riparian vegetation occurs within or along the banks of the feature. Bank-to-bank measurements ranged from 44 feet 9 inches to 50 feet 4 inches. Ordinary High-Water Mark (OHWM) measurements ranged from 8 feet 4 inches to 11 feet 6 inches. The feature appears to have historically flowed east across Read Street into the property to the east; however, the property to the east has been heavily manipulated and the historical drainage no longer exists; flow appears to turn into sheet flow once it crosses the road, as no surface connectivity was observed downstream towards Drainage 2 (no channelization or OWHM was evident downstream).

Drainage 2

Drainage 2 is located southeast of Drainage 1 within the proposed basin site on the northwest corner of Olive Avenue and Spring Street. Drainage 2 facilitates flow from both the properties to the west and road runoff (nuisance flow). According to the historical NHD maps, Drainage 2 is connected downstream from Drainage 1; however, this area has been heavily manipulated from the property owners and developments between Drainage 1 and Drainage 2 and surface connectivity to Drainage 1 no longer exist. No riparian vegetation occurs within or along the banks of the feature. Vegetation includes non-native disturbed/ruderal habitat. Bank to bank measurements ranged from 14 feet 4 inches in the western portion of the site to 3 feet near the eastern portion. OHWM measurements ranged from 7 feet near the western portion to 6 inches near the eastern edge.

An isolated swale feature containing disturbed black willow-red willow thickets occurs northwest of Drainage 2 within the Project basin and is dominated by non-native giant reed, with native black and red willows, and non-native Mexican fan palms scattered throughout. This area is located in a topographical depressional area located in the northwest corner of the proposed water detention basin near Olympia Avenue, west of Spring Street. This feature appears to receive water primarily from sheet flow along Olympia Avenue and the property to the north, an active orchard, which slopes down toward the road, and the property to the west. No evidence of hydrological connectivity to a drainage (i.e., Drainage 2) was observed within the area. This area is considered non-wetland, isolated swale feature (depressional feature) that should not be considered an MSHCP Riparian area nor under CDFW jurisdiction.

Drainage 3

Drainage 3 occurs on the northwest corner of Theda Street and SR-74. Drainage 3 is a mapped NHD ephemeral drainage feature that receives flow primarily from two sources: residential and road run-off (nuisance water) from Theda Street and Club Drive; and sheet flow from the residential area on the west side of Theda Street and Eucalyptus

Avenue. The primary source of water in Drainage 3 is from the residential and road nuisance water just north of the drainage, along the east side of Theda Street, that eventually channelizes and flows in a southeast direction north of the Project footprint, then crosses into the Project immediately northwest of SR-74. Vegetation within Drainage 3 is composed primarily of non-native disturbed/ruderal and disturbed buckwheat scrub. Bank-to-bank measured 12 feet and OHWM measured 2 feet 6 inches. A sparsely vegetated black willow – red willow thickets community (outside and adjacent to the Project boundaries) receives water on the east side of Theda Street and connects via sub-surface flow to Drainage 3 outside of the Project footprint. This MSHCP Riparian area outside of the Project area has features of channelization including banks and an OHWM. Before entering the Project area this drainage appears to turn sub-surface before ultimately flowing into Drainage 3. Project designs will allow for the riparian area to continue to receive flow after improvements and the riparian area will continue to receive sheet and nuisance flow from the surrounding area. Therefore, no impacts are anticipated to occur to this area as a result of Project activities.

Outside of the Project area on the southeast side of SR-74, Drainage 3 continues to flow southeast through a residential area for 0.29 mile into a private property that has been heavily manipulated and altered where it terminates. Based on field observations in the area, no evidence of channelization was observed throughout the property or further east of this point.

4.4.2 Biological Resources (IV) Environmental Checklist and Discussion

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

The Project area is located within MSHCP Subunit 3, the Good Hope East Subunit, of the MVAP and is not within any criteria area cells. Therefore, a Joint Proposed Project Review (JPR) is not required. Furthermore, the site is not in an amphibian survey area, a mammal survey area, or in a narrow endemic plant survey area. No additional surveys for these species are required (Appendix B).

The Project area lies within a MSHCP burrowing owl (*Athene cunicularia hypugaea*) survey area. This California species of special concern is one of the 146 species covered by the MSHCP. Nesting in underground burrows typically abandoned by other animals such as ground squirrels, the burrowing owl prefers open, flat, grassland habitat, a factor that has led to declining numbers in the last 20 years as development has progressed. Owls also tend to nest in the same general location each year. Under federal laws protecting migratory birds, both the owls and their burrows are protected. No burrowing owls or sign were detected during the focused survey. In accordance with the requirements of the MSHCP, pre-construction surveys for burrowing owl will be conducted.

Seven species of wildlife were documented on-site or near the site during the field effort (Appendix C). None of the wildlife species covered by the MSHCP were found within the Project area or its immediate vicinity during the survey conducted on November 3, 2022.

The on-site drainages contain upland vegetation and do not provide habitat for species listed under the MSHCP Section 6.1.2 including least Bell's vireo, southwestern willow flycatcher, western-yellow-billed cuckoo, or fairy shrimp. The biological record search identified one special status plant species not covered by the MSHCP as potentially occurring on site, chaparral sand-verbena (*Abronia villosa var. aurita*). A botanical survey for chaparral sand-verbena was conducted by PSOMAS in April 2021. No chaparral sand-verbena was detected on the project site. A reference population in Temescal Valley was observed to be blooming one day before the survey was conducted, further supporting the negative result. Therefore, no significant impacts would occur, and nothing further is required under CEQA to address special status plants.

The overall goal of the Project is to reduce flooding and control water flow during high flow storms. However, these modifications would result in impacting habitats, and thereby indirectly affecting wildlife within the Project area. Therefore, to ensure less than significant impacts to the species and habitats present, the following mitigation measures shall be implemented.

MM BIO-1 Preconstruction Surveys/Biological Monitoring for Nesting Birds

Vegetation clearing shall be conducted outside of the nesting season, which is generally identified as February through August each year. If avoidance of the nesting season is not feasible, then a qualified biologist shall conduct a nesting bird survey within three days prior to any site disturbance, including disking, demolition activities, and grading. The survey shall encompass suitable habitat in the construction footprint plus a 500-foot buffer. If additional areas are proposed for disturbance, a new nesting bird survey that covers those areas shall be conducted. If nests with eggs or young are detected, the biologist shall establish suitable buffers around the nests, and the buffer areas shall be avoided until the nests are no longer occupied and the juvenile birds can survive independently from the nests. If no active nests are detected, then no further action is required.

MM BIO-2 Preconstruction Burrowing Owl Survey

A pre-construction survey for burrowing owls shall be conducted within 30 days prior to ground disturbance to avoid direct impacts to the species. The survey shall encompass suitable habitat in the construction footprint plus a 500-foot buffer and follow the 2006 Burrowing Owl Survey Instructions for the Western Riverside MSHCP Area. If the species is detected, a Burrowing Owl Protection and Relocation Plan shall be drafted to ensure protection of the species. The plan shall include appropriate avoidance buffers, passive and/or active relocation, construction monitoring, and reporting requirements. The plan shall be reviewed and approved within 30 days of receipt by the RCA and CDFW. If the species is not detected, then no further action is required.

MM BIO-3 Regulatory Permitting

The District will obtain all appropriate regulatory permits for impacts to RWQCB and CDFW jurisdictional areas. To mitigate for permanent impacts to jurisdictional resource areas, the District proposes to implement one of the following options:

- Purchase of mitigation credits through a regulatory agency approved mitigation bank, or other off-site mitigation area at no less than a 1:1 ratio. If mitigation credits are not available at the time of construction, the District will purchase them once the mitigation bank has released them for purchase.
- Permanent impacts to unvegetated jurisdictional areas would be offset through the creation of new unvegetated jurisdictional area within the basin bottom.

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

Refer to response to Part a). The Project would result in modification of the existing habitat, which would result in indirect impacts to natural communities and wildlife species. Therefore, the Project would require implementation of Mitigation Measures BIO-1, BIO-2, and BIO-3. With the implementation of Mitigation Measures BIO-1, BIO-2, and BIO-3 the Project would result in less than significant impacts to sensitive natural communities.

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

The updated Jurisdictional Delineation identified a total of three ephemeral drainages and one riparian area. These areas are subject to the jurisdiction of the RWQCB and CDFW. Table 6 provides a summary of acreages of Jurisdictional Waters that occur within the Project area.

Table 4 - Summary of Acreages of Potential Jurisdictional Waters Within the Project Area

Potential Jurisdictional Waters	Acres
Total Waters of the State Impacts	**0.071**
CDFW Total	**0.268**

The USACE regulates discharge of dredged or fill material into Waters of the U.S. (WOTUS). These waters would include wetland and non-wetland bodies of water that meet specific criteria. USACE regulatory jurisdiction is determined pursuant to Section 404 of the Clean Water Act (CWA) and the definition of WOTUS. On August 29, 2023, the U.S. Environmental Protection Agency and the Department of the Army revised the definition of WOTUS to conform with a 2023 U.S. Supreme Court decision in the case of *Sackett v. Environmental Protection Agency*. On September 8, 2023, the "Revised Definition of 'Waters of the United States,' Conforming" became effective following the Supreme Court's interpretation of the CWA. Under the revised definition, no jurisdictional features which would be qualified as WOTUS are present within the Project area. As such, the drainages identified on site would not be subject to USACE jurisdiction pursuant to Section 404 of the CWA.

RWQCB jurisdiction includes all USACE jurisdictional areas, OHWMs, and any other features that influence surface or subsurface water quality within California. The RWQCB would have jurisdiction over surface waters, which may be identified as ephemeral waters, including those indicated by a change in the average sediment texture, a change in vegetation cover, and/or a break in bank slope. A total of 0.071 acre of non-wetland Waters of the State under the potential jurisdiction of the RWQCB occur in the Project area. The limits of RWQCB jurisdiction were defined by the OHWM and surface waterbody features within the Project area.

There is 0.268 acre within the Project area that have upland vegetation from bank to bank and are potentially regulated by CDFW's Lake and Streambed Alteration Agreement program. CDFW's jurisdiction extends from the top of bank to top of bank and onto any adjacent wetlands or riparian canopies. Each of the three ephemeral drainage features are potentially considered jurisdictional waters.

No direct impacts to the riparian area near Drainage 3 (outside the Project area) are anticipated to occur as a result of the Project. While hydrophytic vegetation is present within this area, no indicators of wetland hydrology or hydric soils were observed; therefore, this area is not considered to be a wetland. Project designs will allow for the riparian area to continue to receive flow after improvements and the riparian area will continue to receive sheet and nuisance flow from the surrounding area. Therefore, no direct or indirect impacts are anticipated to occur to this area as a result of Project activities.

Based on the results of this delineation, USACE does not have jurisdiction over the Project and a CWA Section 404 Permit is not required. A total of 0.071 acre of non-wetland Waters of the State is under the potential jurisdiction of the RWQCB and may be impacted by diversion of the water flow into the proposed detention basin and the proposed placement of the drainage pipes and inlet structures. As such, Waste Discharge Requirements (WDR) are likely to be required by RWQCB for the Project. The Project may be eligible to be covered under Statewide WDR General Order Number 2004-0004-DWQ, which is restricted to dredge and fill discharges of less than 0.2 acre, 400 linear feet, and 50 cubic yards. The impact assessment is based on existing plans that are subject to change based on final design.

There is a combined total of 0.268 acre within the Project area that contains upland vegetation from bank to bank and which CDFW has jurisdiction over. A total of 0.249 acre will be permanently impacted by the Project and 0.019 acre will be temporarily impacted by the construction of the detention basin as well as by the diversion of water flow because of the proposed drainage pipes and culvert replacements. Upland vegetation occurs within and adjacent to the drainage features of the Project area. As stated previously, CDFW regulates impacts or alterations to streambeds, including any obstruction, diversion, or substantial change to the natural flow of a stream, use of material from a stream, or a deposit or disposal of any debris into a stream as part of Fish and Wildlife Code Sections 1600. Therefore, a Streambed Alteration Agreement (SAA) is likely to be required from CDFW for this Project.

Therefore, acquisition and compliance with the necessary CDFW and RWQCB permits would result in a less than significant impact.

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

The Project area is a developed area. While surveys and desktop research indicate that there are various habitats within the area, these are not considered to be lands dedicated to native or migratory wildlife and are not areas designated as wildlife corridors or nursery sites. However, given the Project would disturb native vegetation, mitigation measures shall be implemented to ensure less than significant impacts to these areas. Impacts would then be less than significant with mitigation BIO-1, BIO-2, and BIO-3 incorporated.

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

Good Hope is an unincorporated community within Riverside County. Therefore, this response evaluates applicable policies and ordinances from Riverside County.

Riverside County Ordinance No. 559 relates to the removal of trees. The ordinance requires that no person shall remove any living native tree on any parcel or property greater than one-half acre in size, located in an area above 5,000 feet in elevation and within the unincorporated area of the County of Riverside, without first obtaining a permit to do so. The Project site is entirely located in an area that is lower than 5,000 feet in elevation; therefore, this ordinance is not relevant to does not affect the Project.

No other Riverside County policies or ordinances are applicable to this impact category. Therefore, the Project does not conflict with any local policies or ordinances protecting biological resources or tree preservation, and no impact would occur.

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

The District is a Permittee under the Western Riverside County MSHCP which generally covers the District boundaries within Western Riverside County extending as far east as the Banning area. The MSHCP is permitted by the U.S. Fish and Wildlife Service (USFWS) and CDFW. The Project's consistency with the MSHCP, which is summarized below:

As a Permittee to the Western Riverside County MSHCP, the District is required to comply with Sections 6.1.2, 6.1.3, 6.1.4, 6.3.2, and 7 of the MSHCP. The Project site is not located within a Criteria Cell or Public/Quasi Public Lands; therefore, a Joint Project Review and/or Equivalency Analysis is not required.

Section 6.1.2 Riparian/Riverine, Vernal Pool, and Fairy Shrimp

The Project impact area does not contain riparian habitat and does not provide suitable habitat for the riparian birds listed in Section 6.1.2 of the MSHCP (Psomas, 2019). Additionally, no suitable habitat was identified within the Project impact area that would support vernal pools or fairy shrimp (Psomas, 2019). A total of 0.071 acre of unvegetated streambeds was mapped within the Project impact area. The unvegetated streambeds do not meet the MSHCP definition of Riverine as they have no connectivity to downstream MSHCP Conservation areas and, therefore, do not contribute to the biological functions and values of downstream habitat for covered species within the MSHCP Conservation Area. Additionally, species listed in Section 6.1.2 of the MSHCP are not present and are not expected to occur within the Project area. For these reasons, the District, as a Permittee to the MSHCP, has determined that a Determination of Biologically Equivalent or Superior Preservation (DBESP) is not warranted for this Project.

Section 6.1.3 Narrow Endemic Plant Species

The Project site is not located within any of the MSHCP Narrow Endemic Plant Species Survey Areas. Therefore, the project is consistent with Section 6.1.3 of the MSHCP.

Section 6.1.4 Urban/Wildlands Interface Guidelines

The Project site is not located adjacent to any Criteria Cells, Conservation Areas, Cores/Linkages, or P/QP lands identified by the MSHCP and thus would not affect these areas. The requirements for Urban/Wildlands Interface do not apply to this Project site because it is not located adjacent to any MSHCP Conservation Areas. The Project site is relatively isolated from larger, contiguous blocks of native habitat and surrounded by residential development and other anthropogenic land use; therefore, net long-term increase of edge impacts is not expected because of the Project. Flows from the Project site do not convey to downstream MSHCP Conservation Areas and would not significantly impact water quality as described in the Hydrology and Water Quality section. Impacts related to urban/wildlands interface would be less than significant and Project is consistent with Section 6.1.4 of the MSHCP.

Section 6.3.2 Criteria Area Survey Species

The Project site is located within an MSHCP-designated survey area for burrowing owl. Although suitable habitat was detected onsite, no burrowing owls or signs were detected during the focused survey. In accordance with the requirements of the MSHCP, pre-construction surveys for burrowing owl will be conducted. Impacts to burrowing owls would be less than significant with the implementation of **Mitigation Measure BIO-2**. Additionally, the Project is consistent with Section 6.3.2 of the MSHCP.

Section 7 Covered Activities/Allowable Uses

The development of new public facilities or modifications to existing public facilities are contemplated as 'Covered Activities' in the MSHCP and are described in MSHCP Sections 7.3.4–9. Covered Activities that are carried out by Permittees, Participatory Special Entities, Third Parties Granted Take Authorization, and others within the MSHCP Plan Area, that are outside of the Criteria Area and P/QP Lands, are permitted under the Plan, subject to consistency with MSHCP policies. The proposed Project would be considered a covered activity. The proposed Project will incorporate the applicable Construction Guidelines per MSCHP Section 7.5.3 and the BMPs contained in Appendix C of the MSHCP. As such, the proposed Project will satisfy the BMP requirements of the MSHCP and is consistent with Section 7.5.3 of the MSHCP.

Based on the above analysis, the Project would not conflict with the MSHCP or any other habitat conservation plan. Therefore, impacts would be less than significant with incorporation of Mitigation Measure BIO-2.

4.4.3 Mitigation Measures

MM BIO-1 Vegetation clearing shall be conducted outside of the nesting season, which is generally identified as February through August each year. If avoidance of the nesting season is not feasible, then a qualified biologist shall conduct a nesting bird survey within three days prior to any site disturbance, including disking, demolition activities, and grading. The survey shall encompass suitable habitat in the construction footprint plus a 500-foot buffer. If additional areas are proposed for disturbance, a new nesting bird survey that covers those areas shall be conducted. If nests with eggs or young are detected, the biologist shall establish suitable buffers around the nests, and the buffer areas shall be avoided until the nests are no longer occupied and the juvenile birds can survive independently from the nests. If no active nests are detected, then no further action is required.

MM BIO-2 A pre-construction survey for burrowing owls shall be conducted within 30 days prior to ground disturbance to avoid direct impacts to the species. The survey shall encompass suitable habitat in the construction footprint plus a 500-foot buffer and follow the 2006 Burrowing Owl Survey Instructions for the Western Riverside MSHCP Area. If the species is detected, a Burrowing Owl Protection and Relocation Plan shall be drafted to ensure protection of the species. The plan shall include appropriate avoidance buffers, passive and/or active relocation, construction monitoring, and reporting requirements. The plan shall be reviewed and approved within 30 days of receipt by the RCA and CDFW. If the species is not detected, then no further action is required.

MM BIO-3 The District will obtain all appropriate regulatory permits for impacts to RWQCB and CDFW jurisdictional areas. To mitigate for permanent impacts to jurisdictional resource areas, the District proposes to implement one of the following options:

- Purchase of mitigation credits through a regulatory agency approved mitigation bank, or other off-site mitigation area at no less than a 1:1 ratio. If mitigation credits are not available at the time of construction, the District will purchase them once the mitigation bank has released them for purchase.
- Permanent impacts to unvegetated jurisdictional areas would be offset through the creation of new unvegetated jurisdictional area within the basin bottom.

4.5 Cultural Resources

An Archaeological Survey Report (ASR) (Appendix D) and Paleontological Survey Report (PSR) (Appendix E) were prepared for the Project by Chambers Group in December 2022. Chambers Group utilized a previously conducted records search requested from the Eastern Information Center, a member of the California Historical Resources Information System, as part of the Archaeological Literature Review process prior to a site survey of the 27-acre Project location. The ASR and PSR outline the archaeological and paleontological findings.

4.5.1 Environmental Setting

The cultural and paleontological resource characteristics of Riverside County reflect human settlement, exploitation, arts, crafts, technology, ideology, and past environmental conditions. The heritage values of cultural resources are typically expressed in the disciplines of architecture, anthropology (including archaeology), history, and engineering. Paleontological resources are fossilized biotic remains of ancient environments. They are valued for the information they yield about the history of the earth and its past ecological settings. Cultural resources consist of places (historic and prehistoric archaeological sites), structures, or objects that provide evidence of past human activity. They are important for scientific, historic, and/or religious reasons to cultures, communities, groups, and/or individuals (County 2015).

A records search request was sent by Psomas Engineering (Psomas) to the Eastern Information Center at the University of California, Riverside, on September 10, 2019, and a paleontological records search request was sent to the Western Science Center on October 8, 2019. Chambers Group conducted archaeological and paleontological surveys within the Good Hope-Olive Avenue Project area on November 3, 2022. The primary goal of the surveys was to gather and analyze the information obtained to determine if the Project would impact cultural and paleontological resources.

4.5.2 Cultural Resources (V) Environmental Checklist and Discussion

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

The National Historic Preservation Act (NHPA) establishes the nation's policy for historic preservation and sets in place a program for the preservation of historic properties by requiring federal agencies to consider effects to significant cultural resources (i.e., historic properties) prior to undertakings.

The National Register of Historic Places (NRHP) was established by the NHPA of 1966 as "an authoritative guide to be used by federal, state, and local governments, private groups, and citizens to identify the Nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment." The NRHP recognizes properties that are significant at the national, state, and local levels. To be eligible for listing in the NRHP, a resource must be significant in American history, architecture, archaeology, engineering, or culture. A property is eligible for the NRHP if it is significant under one or more of the following criteria:

Criterion A: It is associated with events that have made a significant contribution to the broad patterns of our history.

Criterion B: It is associated with the lives of persons who are significant in our past.

Criterion C: It embodies the distinctive characteristics of a type, period, or method of construction; represents the work of a master; possesses high artistic values; or represents a significant and distinguishable entity whose components may lack individual distinction.

Criterion D: It has yielded, or may be likely to yield, information important in prehistory or history.

In addition to the four National Register Criteria noted above, qualifying resources must retain aspects of integrity. Integrity is the ability of a property to convey its significance.

Cemeteries, birthplaces, or graves of historic figures; properties owned by religious institutions or used for religious purposes; structures that have been moved from their original locations; reconstructed historic buildings; and properties that are primarily commemorative in nature are not considered eligible for the NRHP unless they satisfy certain conditions. In general, a resource must be at least 50 years of age to be considered for the NRHP, unless it satisfies a standard of exceptional importance.

Under the provisions of CEQA, including CEQA Statutes (Public Resources Code [P.R.C.] §§21083.2 and 21084.1), CEQA Guidelines (Title 14 California Code of Regulations [C.C.R.], §15064.5), and PR.C. §5024.1 (Title 14 C.C.R. §4850 et seq.), properties expected to be directly or indirectly affected by a proposed project must be evaluated for eligibility for listing in the California Register of Historical Resources (CRHR; PR.C. §5024.1).

Analysis of historical topographic maps and aerial photographs and an online search of APNs for several parcels within the Project area identified nine APNs associated with five proposed water diversion and storage areas. Each of these parcels were field checked for properties that may be adversely affected by the Project.

Only a single potentially significant building (APN 343-100-006) was identified adjacent to a proposed improvement: Read Street Basin (north). Psomas (2019) identified this property in their report noting that "one structure, a 1,143 square-foot (sf) single family home containing two bedrooms was built in the center of the property in 1956." Psomas also noted that the other two buildings on the property, located on the northern portion of the parcel, were constructed between 2005 and 2006. The circa 1956 residence is not on the 1953 aerial (Figure 9) but is on the 1962 and subsequent aerials (Figure 10 to Figure 12). The residence is a simple cross gabled, ranch-style building with a colonnaded shed roof porch, and appears to be finished in stucco, with recently updated vinyl windows (Photograph 1). The Project will not directly impact the residence (Photograph 2). In addition, the building does not appear to possess character defining features that would qualify it for inclusion on the NRHP or the CRHR.

Based on the surveys and review of historical documents and record search results, no buildings or resources have been identified to possess character defining features that would quality it for inclusion on the NRHP or the CRHR, nor do the identified resources appear to be an example of exemplary work of a master craftsman. Additionally, improvements would likely be confined to within the existing channel and will likely not affect any qualities that may make either property eligible for inclusion on the NRHP or the CRHR. No cultural materials were identified within the survey area of these parcels. No historic-period materials associated with the late nineteenth century were identified within the Project area.

Because no buildings have been identified to be of historic value, impacts to this category would be considered less than significant.

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

Four cultural resources were identified during the survey and record search conducted for the Project.

Theda Street was identified as a historic road constructed between 1942 and 1955. Archival research indicated that no prior street alignment is associated with this area in particular. No substantial adverse change to the significance and setting of the road (or its integrity) is expected from the implementation of the Project, therefore its potential eligibility for inclusion on the registers will not be affected.

Per CEQA Guidelines, the Project should be designed to avoid impacts to cultural resources within the Project area whenever feasible. The following mitigation measures would be implemented as part of Project approval to ensure that potential impacts to archaeological resources are less than significant.

MM CUL-1 The District shall cause for a Cultural Resources Treatment Plan (CRTP) to be developed to further outline the protocols for monitoring and management of unanticipated discoveries of cultural resources during construction. The CRTP will identify portions of the project and activities for which monitoring by a qualified Cultural monitor or Tribal Cultural monitor shall be required, due to the proximity of construction activities to Cultural Resources.

MM CUL-2 Prior to commencing construction activities and thus prior to any ground disturbance in the Project area, a qualified Archaeologist or Cultural monitor shall conduct initial Worker Environmental Awareness Program (WEAP) training for all construction personnel, including supervisors, present at the outset of the Project construction work phase. The Lead Contractor shall make their personnel available for WEAP training. A Tribal monitor shall be provided with the opportunity to attend the pre-construction briefing, if requested. This WEAP training will also educate the monitor(s) of construction procedures to avoid construction-related injury or harm. This training or similar training materials may be provided periodically, as needed or for any new personnel working in the Project area.

MM CUL-3 If deposits of prehistoric or historical materials are encountered during project construction, all work within 50 feet of the discovery shall be halted until an archaeologist can evaluate the findings and make recommendations. A qualified archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards for prehistoric and historic archaeologist, shall be retained to evaluate the significance of the find. The archaeologist shall have the authority to modify the no-work radius as appropriate, using professional judgement and in consultation with the District.

- If the professional archaeologist determines that the find does not represent a cultural resource, work may resume immediately, and no agency notifications are required.
- If the professional archaeologist determines that the find represents a cultural resource, the handling of the cultural resource(s) shall follow the applicable recommendations as described in the CRTP prepared for the Project, as required by Mitigation Measure CUL-1 and TCR-1.

MM CUL-4 If subsurface deposits believed to be cultural in origin are discovered during construction, all work must halt within a 100-foot radius of the discovery. A qualified professional archaeologist meeting the Secretary of the Interior's Professional Qualification Standards for prehistoric and historic archaeologists shall be retained to evaluate the significance of the find. The archaeologist shall have the authority to modify the no-work radius as appropriate, using professional judgment and in consultation with the District. If the professional archaeologist determines that the find does not represent a cultural resource, work may resume immediately, and no agency notifications are required. If the professional archaeologist determines that the find represents a cultural resource, the handling of the cultural resource(s) shall follow the applicable recommendations as described in the CRTP prepared for the Project, as required by Mitigation Measure CUL-1 and TCR-1.

In the event that human remains are unearthed during excavation and grading activities, all activity shall cease immediately. Pursuant to California Health and Safety Code Section 7050.5, no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to California Public Resources Code Section 5097.98. If the remains are determined to be of Native American descent, the Coroner is required to notify the Native American Heritage Commission (NAHC) within 24 hours. The NAHC is required to contact the most likely descendant of the deceased Native American, who shall serve as consultant on how to proceed with the remains.

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

Based on the results of the record searches and survey, the Project is not expected to disturb any human remains during construction. However, because resources are often buried and not easily identifiable, the Project shall comply with the California Health and Safety Code as outlined below:

If human remains or remains that are potentially human are found, the District or County shall retain a qualified professional archaeologist to ensure reasonable protection measures are taken to protect the discovery from disturbance. The archaeologist shall notify the Riverside County Coroner per §7050.5 of the Health and Safety Code. Handling of the discovery shall follow the provisions set forth by §7050.5 of the California Health and Safety Code and §5097.98 of the California Public Resources Code. In the event of an unanticipated discovery of human remains, the County Coroner shall be notified immediately. If the human remains are determined to be prehistoric, the County Coroner shall notify the NAHC, which shall notify a most likely descendant (MLD). The MLD shall complete the inspection of the site within 48 hours of notification and may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials. Compliance with the regulatory standard would result in impacts to be less than significant.

4.5.3 Mitigation Measures

MM CUL-1 The District shall cause for a Cultural Resources Treatment Plan (CRTP) to be developed to further outline the protocols for monitoring and management of unanticipated discoveries of cultural resources during construction. The CRTP will identify portions of the project and activities for which monitoring by a qualified Cultural monitor or Tribal Cultural monitor shall be required, due to the proximity of construction activities to Cultural Resources.

MM CUL-2 Prior to commencing construction activities and thus prior to any ground disturbance in the Project area, a qualified Archaeologist or Cultural monitor shall conduct initial Worker Environmental Awareness Program (WEAP) training for all construction personnel, including supervisors, present at the outset of the Project construction work phase. The Lead Contractor shall make their personnel available for WEAP training. A Tribal monitor shall be provided with the opportunity to attend the pre-construction briefing, if requested. This WEAP training will also educate the monitor(s) of construction procedures to avoid construction-related injury or harm. This training or similar training materials may be provided periodically, as needed or for any new personnel working in the Project area.

MM CUL-3 If deposits of prehistoric or historical materials are encountered during project construction, all work within 50 feet of the discovery shall be halted until an archaeologist can evaluate the findings and make recommendations. A qualified archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards for prehistoric and historic archaeologist, shall be retained to evaluate the significance of the find. The archaeologist shall have the authority to modify the no-work radius as appropriate, using professional judgement and in consultation with the District.

- If the professional archaeologist determines that the find does not represent a cultural resource, work may resume immediately, and no agency notifications are required.
- If the professional archaeologist determines that the find represents a cultural resource, the handling of the cultural resource(s) shall follow the applicable recommendations as described in the CRTP prepared for the Project, as required by Mitigation Measure CUL-1 and TCR-1.

MM CUL-4 If subsurface deposits believed to be cultural in origin are discovered during construction, all work must halt within a 100-foot radius of the discovery. A qualified professional archaeologist meeting the Secretary of the Interior's Professional Qualification Standards for prehistoric and historic archaeologists shall be retained to evaluate the significance of the find. The archaeologist shall have the authority to modify the no-work radius as appropriate, using professional judgment and in consultation with the District. If the professional archaeologist determines that the find does not represent a cultural resource, work may resume immediately, and no agency notifications are required. If the professional archaeologist determines that the find represents a cultural resource, the handling of the cultural resource(s) shall follow the applicable recommendations as described in the CRTP prepared for the Project, as required by Mitigation Measure CUL-1 and TCR-1.

In the event that human remains are unearthed during excavation and grading activities, all activity shall cease immediately. Pursuant to California Health and Safety Code Section 7050.5, no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to California Public Resources Code Section 5097.98. If the remains are determined to be of Native American descent, the Coroner is required to notify the Native American Heritage Commission (NAHC) within 24 hours. The NAHC is required to contact the most likely descendant of the deceased Native American, who shall serve as consultant on how to proceed with the remains.

4.6 Energy

4.6.1 Environmental Setting

Energy consumption is analyzed in this Initial Study due to the potential direct and indirect environmental impacts associated with the Project. Such impacts include the depletion of nonrenewable resources (oil, natural gas, coal, etc.) during the construction phases. Southern California Gas and Southern California Edison are the existing providers for natural gas and electricity to Riverside County.

4.6.2 Energy (VI) Environmental Checklist and Discussion

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

The Project would utilize energy resources during construction. Energy resources that would be potentially utilized include electricity, natural gas, and petroleum-based fuel supplies and distribution systems.

According to the California Energy Commission's Electricity Consumption by Riverside County, the estimated energy usages for all sectors (residential and non-residential) for 2022 was approximately 16,630 (GWh) gigawatt-hours (CEC 2024). According to the CalEEMod (Appendix A), construction electricity consumption and emission factors for CO_2, CH_4, and N_2O were estimated to be 532, 0.03, and <0.005 lb/MWh (megawatt-hours), respectively for construction activities annually between 2025 and 2027. This translates to 0.532 lb/MWh of CO_2, 0.00003 lb/MWh of CH_4, and .000005 lb/MWh of N_2O which are nominal in comparison to the usage estimates for 2021 which are expected to be similar to 2022 estimates.

Construction activities associated with the Project would be required to adhere to all state and SCAQMD regulations for off-road equipment and on-road trucks, which provide minimum fuel efficiency standards. As such, construction activities for the Project would not result in the wasteful, inefficient, and unnecessary consumption of energy resources. Development of the Project would not result in the need to manufacture construction materials or create new building material facilities specifically to supply the Project. It is difficult to measure the energy used in the production of construction materials such as asphalt, steel, and concrete, it is reasonable to assume that the production of these materials (e.g., concrete, steel, etc.,) would employ all reasonable energy conservation practices in the interest of minimizing the cost of doing business.

The Project would comply with all federal, state, and City requirements related to the consumption of energy, particularly through the consumption of fuels during Project construction. The Project construction would have a nominal effect on local and regional energy supplies, especially over the long-term. Construction equipment fleet turnover and increasingly stringent state and federal regulations (i.e., CARB, EPA) on engine efficiency combined with state regulations (e.g., engine idling limit times and requirements for construction debris recycling), would further reduce the amount of transportation fuel demand during Project construction. Operation of the Project would not result in a significant increase in energy usage because the Project would be used to capture and redirect flows during storm events. Any need for energy use would be for on-site maintenance. Therefore, the Project would not result in the wasteful, inefficient, or unnecessary consumption of energy resources during Project construction or operation. Impacts would be less than significant.

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

The Project would be designed in a manner that is consistent with relevant energy conservation plans and programs including the Desert Renewable Energy Conservation Plan (DRECP) and the Riverside County Climate Action Plan, which encourage the use of renewable resources and promote efficient use of energy resources. The Project consists of drainage improvements to alleviate flooding issues within the Project area and would not result in the excessive use of any energy, natural gas, or fuel consumption once construction is complete.

Additionally, all development in the County, including the Project area, are required to adhere to all County adopted policy provisions, including those in the Riverside County Climate Action Plan. The Project would not conflict or obstruct any local or state plans for renewable energy or energy efficiency, therefore no impacts would occur.

4.6.3 Mitigation Measures

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

4.7 Geology and Soils

4.7.1 Environmental Setting

The Project area is in a rural community and is relatively flat, with an average elevation of 1,576 feet amsl. The surrounding land includes the Temescal Mountains to the west and residential homes surrounding the rest of the Project area. Land uses include rural residential neighborhoods, disturbed non-native grasslands, open fields, dirt roads, and paved roads.

The unincorporated Riverside County contains parts of several known active and potentially active earthquake faults including San Andreas, San Jacinto, and Elsinore Faults (County 2021). According to the U.S. Geology Survey, the nearest fault zone to the Project is the Elsinore Fault Zone, approximately 7.5 miles south of the Project area (USGS 2022).

A Geotechnical Exploration Report was prepared for the Project by Leighton Consulting, Inc. in May 2023 (Appendix F). The analysis summarized the survey and review of the regional geologic maps. The proposed alignment is primarily located within Quaternary-age alluvial fan deposits (Qof) underlain by granitic bedrock at depth. Specifically, the alignment is underlain by existing pavement, undocumented fill, Quaternary-age alluvium, and granitic bedrock. The undocumented fill soils consist primarily of moist silty sand. The sampled alluvium consisted generally of moist, loose to medium dense, silty sand (SM) and clayey sand (SC) and is expected to possess low expansion and slight collapse potential. Bedrock was encountered below the artificial fill and alluvial deposits and is relatively uniform and will vary in hardness and density depending on the depth. No surface water was observed during the field exploration and depths of groundwater are estimated to be 12 to 13 feet below ground surface. Soil composition in the area consists mostly of Hanford coarse sandy loam, Cajalco fine sandy loam, Fallbrook fine sandy loam, and Ysidora gravelly very fine sandy loam with 2 to 8 percent slopes. (USDA 2023).

4.7.2 Geology and Soils (VII) Environmental Checklist and Discussion

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

ii) Strong seismic ground shaking?	☐	☐	☐	☒
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒

i and ii)

Ground shaking is a potential hazard resulting from earthquakes along major active or potentially active faults. As discussed in the Environmental Setting (Section 4.7.1), the Project area is not located on or within the immediate vicinity of an earthquake fault zone. The nearest known earthquake fault as delineated on the Alquist-Priolo Earthquake Fault Zoning Map is located approximately seven miles southwest of the Project area and referred to as the Glen Ivy North Fault within the Elsinore Fault Zone. Therefore, the Project is well outside of the proximity of a mapped Fault Zone. Additionally, the Project would not include construction of structures that would be impacted by the result of a fault rupture or strong seismic ground shaking. Because the Project is not located on a fault zone, faults do not traverse or cross towards the Project, and the Project does not include new structures, no impact would occur.

iii)

Secondary seismic hazards for the region include liquefaction, slope instability, earthquake-induced seiches, tsunami flooding, and slope instability. Liquefaction occurs when loosely packed, water-saturated sediments near or at ground surface lose their strength due to ground shaking, which, in turn, causes the sediment to act like a fluid. For liquefaction to occur, the area must have loose, clean granular soils, shallow groundwater, and have strong, long durations of ground shaking.

In comparison to other portions of Southern California, localized seismic hazard potential in the Mead Valley area is relatively light. According to the California Geological Survey (CGS) maps the Project is not located within a liquefaction zone and consists of low susceptible sediments (DOC 2023, County 2021). Because of these conditions and the Project's proposed activities would not include new structures that could affect life and property, no impacts would occur.

iv)

Landslides occur when there is a disturbance in the stability of a sloped area, which can be initiated by rainfall, snowmelt, change in water levels, erosion, groundwater changes, earthquakes, volcanic activity, disturbance through human activities, or a combination of these factors. Seismically induced landslides and other similar slope failures are a common occurrence during or after earthquakes, particularly within the region.

As described in Environmental Setting (Section 4.7.1), the general area at and around the Project has 2 to 8 percent slopes, per the NRCS Web Soil Survey. As noted in the MVAP's Slope Instability figure, the Project is not located in an area with existing landslides, seismically induced landslide areas, or rockfalls.

The Project would not result in significant risk of loss, injury, or death resulting from landslides because the area has low susceptibility to landslides. Furthermore, the addition of the detention basin would not create steep slopes that could trigger landslides as it would comply with shoring, bracing, and benching in accordance with the Department of Industrial Relation's California Construction Safety Orders (District 2021). Therefore, due to the proposed activities of the Project and its regional location, no impacts would occur.

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

Topsoil is the top layer of soil and usually holds high concentrations of organic matter, which typically is found in fields and other vegetated areas. Loss of topsoil or any type of soil erosion occurs when dirt is exposed to physical factors such as strong winds, rain, and flowing water.

As discussed in Section 4.2: Agriculture and Forestry Resources, the Project is zoned within a rural community that permits limited agricultural activities. However, the Project does not propose new agricultural uses, nor does it involve agricultural activities. The intent of the Project is to update the existing storm drains and inlets and construct a basin to provide flood infrastructure within the Project area. The location of the basin is not in an area that is proposed for agricultural uses and would have topsoil.

Properties within the Project disturbance areas would be subjected to winds and rain. During any ground-disturbing activity, including grading and excavation, existing dirt and soils would be disturbed and subject to erosion. As part of Rule 403 of AQMD to address fugitive dust, implementation of these dust control methods would minimize any potential soil erosion. Other general construction methods that would be implemented include use of barriers covers. Best management practices (BMPs) for erosion control are required under National Pollution Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit. With implementation of general construction methods and with the basin and infrastructure completed, impacts would be less than significant.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) 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?	☐	☐	☒	☐

Lateral spreading is the lateral movement, usually of soils, that is caused by earthquake-induced liquefaction. The shaking reduces the stiffness and strength of the soil, thereby causing ground movement ranging from a few centimeters to several meters. Lateral spreading often occurs along shorelines and riverbanks where there are loose, saturated sandy soils at shallow depths.

Subsidence on land is the downward shift (gradual or sudden) of the land surface and can be caused by natural or human-induced activities through the moving of earth materials, such as soils. Main causes of land subsidence include but are not limited to drainage of organic soils, underground mining, sinkholes, compaction, or removal of underground water.

According to the General Plan Safety Element's Liquefaction Zone map, the Project is not located within or nearby a CGS Liquefaction Zone (County 2021). The DOC's CGS mapping does not show the Project area to be within a landslide study area (DOC 2023). The Project would involve temporary slopes and trenches excavated during the construction of the basin. These activities shall be designed and completed in accordance with the California Construction Safety Orders (Appendix F). The Project area is not in an area susceptible to lateral spreading, liquefaction, or subsidence, and is in compliance with safety orders for temporary slopes. Therefore, Project impacts would be less than significant.

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

Expansive soils are soils, clay, and other fine, viscous particles that are prone to expansion or shrinkage due to a direct variation in water content/volume. Swelling occurs when there is a large amount of water present, while shrinkage results when water evaporates. The continued cycle of swelling and shrinking causes soil to move, which can cause structures built on expansive soil to sink or rise unevenly, thereby requiring foundation repairs.

According to the General Plan Safety Element, expansive soils are routinely alleviated through the County's implementation of the Building Code during development. Expansive soils in the County are widely dispersed and typically found along the hillside areas and in low-lying alluvial basins.

The Project's intent is to update the existing storm drains and inlets and construct a basin to provide flood infrastructure within the Project area. The Project would not involve construction of any structures that could create indirect or direct risks to life or property. Additionally, the Project is not located within the hillside areas of the County. Impacts, therefore, would be less than significant.

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

The Project would not involve the construction or need for septic tanks or alternative wastewater disposal systems. No residential, commercial, or industrial uses are proposed that would require sewer or septic connections. No impact would occur.

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

Paleontological resources are evidence of life forms of the past, especially prehistoric life forms, such as plant and animal fossils. These resources can be divided into four groups: paleobotany, invertebrates, vertebrates, and trace fossils. Evidence of these life forms can be presented through fossilized remains or traces of multicellular vertebrates or invertebrate animals, multicellular plants, and their imprints. Unique geologic features are those that are unique in the field of geology and include features that provide high aesthetic value to the area, are part of a scenic view or topographic features, contain unique minerals, and/or provide historic value relating to past periods of human history.

An updated Paleontological Survey Report was prepared for the Project by Chambers Group and is provided in Appendix E. Chambers Group utilized a previously conducted records search requested from the Western Science Center as part of the Paleontological Literature Review process prior to completing a site survey of the 27-acre Project location.

Paleontological materials were not identified on the surface during the survey. It was recognized that the County of Riverside lists the Project area as an area of low sensitivity and, thus, has a low propensity for encountering such resources. Previous studies concluded, however, that soil disturbances could result in destruction of paleontological resources underlying the Project area. Therefore, the following mitigation measures shall be implemented to result in less than significant impacts.

MM PAL-1 If paleontological resources are discovered during earth disturbance activities, the discovery shall be cordoned off with a 50-foot radius buffer to protect the discovery from further potential damage, and a Riverside County-qualified paleontologist shall be consulted to assess the discovery. If the discovery is determined to be significant by the paleontologist, a Paleontological Resources Mitigation Program (PRMP) shall be initiated, which will include appropriate monitoring of earth disturbance activities.

4.7.3 Mitigation Measures

MM PAL-1 If paleontological resources are discovered during earth-disturbing activities, the discovery shall be cordoned off with a 50-foot radius buffer to protect the discovery from further potential damage, and a Riverside County–qualified paleontologist shall be consulted to assess the discovery. If the discovery is determined to be significant by the paleontologist, a Paleontological Resources Mitigation Program (PRMP) shall be initiated, which will include appropriate monitoring of earth disturbance activities.

4.8 Greenhouse Gas Emissions

4.8.1 Environmental Setting

Certain gases in the earth's atmosphere, classified as greenhouse gases (GHGs), play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface, and a smaller portion of this radiation is reflected toward space. This absorbed radiation is then emitted from the earth as low-frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. Because the earth has a much lower temperature than the sun, it emits lower-frequency radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead trapped, resulting in a warming of the atmosphere. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate on earth. Without the greenhouse effect, the earth would not be able to support life as we know it.

Prominent GHGs contributing to the greenhouse effect are CO2, methane (CH4), and nitric oxide (N2O). Fluorinated gases also make up a small fraction of the GHGs that contribute to climate change. Fluorinated gases include chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride; however, these gases are not associated with typical land use development. Human-caused emissions of these GHGs in excess of natural ambient concentrations are believed to be responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's climate, known as global climate change or global warming. It is "extremely likely" that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in GHG concentrations and other anthropogenic factors combined (IPCC 2014).

Table 5 describes the primary GHGs attributed to global climate change, including their physical properties, primary sources, and contributions to the greenhouse effect.

Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule in the atmosphere. CH_4 traps over 25 times more heat per molecule than CO_2, and N_2O absorbs 298 times more heat per molecule than CO_2 (IPCC 2014). Often, estimates of GHG emissions are presented in carbon dioxide equivalents (CO_{2e}), which weigh each gas by its global warming potential. Expressing GHG emissions in CO_{2e} takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted.

Climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern. Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes (about one day), GHGs have long atmospheric lifetimes (one to several thousand years). GHGs persist in the atmosphere long enough to be dispersed around the globe. An individual project of this size and nature is of insignificant magnitude by itself to influence climate change or result in a substantial contribution to the global GHG inventory. GHG impacts are recognized as exclusively cumulative impacts; there are no noncumulative GHG emission impacts from a climate change perspective. The additive effect of Project–related GHGs would not result in a reasonably foreseeable cumulatively considerable contribution to global climate change.

Although the exact lifetime of any particular GHG molecule is dependent on multiple variables and cannot be pinpointed, it is understood that more CO2 is emitted into the atmosphere than is sequestered by ocean, vegetation, or other forms of uptake. Of the total annual human-caused CO2 emissions, averaged over the last 50 years, approximately 55 percent is sequestered through ocean and land uptake every year, while the remaining 45 percent is stored in the atmosphere (IPCC 2013).

Table 5 - Greenhouse Gases

Greenhouse Gas	Description
CO_2	CO_2 is a colorless, odorless gas. CO_2 is emitted in a number of ways, both naturally and through human activities. The largest source of CO_2 emissions globally is the combustion of fossil fuels such as coal, oil, and gas in power plants, automobiles, industrial facilities, and other sources. A number of specialized industrial production processes and product uses such as mineral production, metal production, and the use of petroleum-based products can also lead to CO2 emissions. The atmospheric lifetime of CO_2 is variable because it is so readily exchanged in the atmosphere.
CH_4	CH_4 is a colorless, odorless gas and is the major component of natural gas, about 87 percent by volume. It is also formed and released to the atmosphere by biological processes occurring in anaerobic environments. CH_4 is emitted from a variety of human-related and natural sources. Human-related sources include fossil fuel production, animal husbandry (intestinal fermentation in livestock and manure management), rice cultivation, biomass burning, and waste management. These activities release significant quantities of CH_4 to the atmosphere. Natural sources of CH_4 include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, non-wetland soils, and other sources such as wildfires. The atmospheric lifetime of CH_4 is about 12 years.
N_2O	N_2O is a clear, colorless gas with a slightly sweet odor. N_2O is produced by both natural and human-related sources. Primary human-related sources of N_2O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuels, adipic acid production, and nitric acid production. N_2O is also produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests. The atmospheric lifetime of N_2O is approximately 120 years.

4.8.2 Regulatory Framework

Riverside County Climate Action Plan

One of the main objectives of the Riverside County Climate Action Plan (CAP; 2019) is to provide a more livable, equitable, and economically vibrant community through the incorporation of sustainability features and reduction of GHG emissions. The goals and policies identified in the CAP are geared toward improving sustainability in Riverside County and incorporating greater environmental responsibility into its daily management. To achieve compliance with statewide GHG reduction targets the County of Riverside has put into effect local policies that will reduce GHG emissions by 15 percent by 2020. These policies encourage energy efficiency and renewable energy in buildings, transit-oriented planning, and water conservation, and increase water diversion. The CAP provides a focused roadmap for advancing environmental sustainability and reducing GHG emissions in the County.

Riverside County GHG Screening

As part of the 2019 CAP Update, the County implemented cost-effective strategies for reducing community-wide GHG emissions associated with new development projects. These strategies include applying an emissions level that is determined to be less than significant for small projects and utilizing the Screening Tables to mitigate project GHG emissions that exceed a threshold of 3,000 metric tons of CO_{2e} ($MTCO_{2e}$) per year. The purpose of the Screening Tables is to provide guidance in measuring the reduction of GHG emissions attributed to certain design and construction measures incorporated into development projects.

4.8.2 Greenhouse Gas Emissions (VIII) Environmental Checklist and Discussion

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

Construction

Construction-related activities that would generate GHGs include commuter trips, haul trucks carrying supplies and materials to and from the Project area, and off-road construction equipment (e.g., dozers, loaders, excavators). Table 6 illustrates the specific construction generated GHG emissions that would result from construction of the Project. GHG emissions from construction will be below the 3,000 MTCO2e per year significance threshold, as such, emissions that may result will not be amortized over a 30-year period. Additionally, the Project does not have operational emissions that may impact transportation in the region and contribute to long-term GHG emissions. Actual construction of the Project would be dictated by several regulatory forces. As such, if construction starts later, it can be expected that Project emissions would be reduced because CalEEMod incorporates lower emission factors associated with construction equipment in future years due to improved emissions controls and fleet modernization through turnover.

Table 6 - Construction-Related Greenhouse Gases

Emissions Source	MTCO2e per Year
2025	398
2026	347
2027	12
Total	**757**
Source: CalEEMod version 2022.1. See Attachment A for emission model outputs.	

As shown in Table 6, Project construction would result in the generation of approximately 757 metric tons of CO_{2e} over the course of construction. Once construction is complete, the generation of these GHG emissions would cease.

As discussed further below, impacts resulting from the GHG emissions from construction of the Project would be less than significant.

Operation

In terms of operational GHG emissions, the Project involves the development of the Good Hope–Olive Avenue Storm Drain. The Project would not include the provision of new permanent stationary or mobile sources of emissions; therefore, by its very nature, the Project would not generate quantifiable GHG emissions. Additionally, vehicle trips to the Project area due to maintenance would be minimal. Thus, GHG emissions from construction added to negligible operation GHG Impacts would result in less than significant impacts.

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

The Riverside County CAP is a strategic planning document that identifies sources of GHG emissions within Riverside County boundaries; presents current and future emission estimates; identifies a GHG reduction target for future years; and presents strategies, policies, and actions to reduce emissions from the energy, transportation, land use, water use, and waste sectors. The GHG reduction strategies in the CAP build on inventory results and key opportunities prioritized by Riverside County staff and members of the public. The CAP consists of strategies that identify steps Riverside County will take to support reductions in GHG emissions. Riverside County will achieve these reductions in GHG emissions through a mix of voluntary programs and new strategic standards. All standards presented in the CAP respond to the needs of development through achievement of more efficient and sustainable resources.

Both the existing and the projected GHG inventories in the CAP are based on the land use designations and associated designations defined in the County of Riverside General Plan. The Project involves the improvement of stormwater drainage and flood protection facilities to ensure public safety. The Project does not involve any uses that would increase the population beyond what is considered in the General Plan. Since the Project is consistent with the General Plan it is consistent with the types, intensity, and patterns of land use envisioned for the site vicinity in the General Plan; as a result, the Project would not conflict with land use assumptions or exceed population or job growth projections used by the County to develop the CAP update.

In addition to complying with the land use assumptions and population/job growth projections used by the County to develop the CAP, the Project's compliance with the County's GHG Plan is demonstrated through the CAP development review process, which ensures the implementation of appropriate GHG-reduction requirements to projects. Specifically, this process employs Screening Tables to mitigate project GHG emissions that exceed a threshold of 3,000 MTCO2e per year. The purpose of the Screening Tables is to provide guidance in measuring the reduction of GHG emissions attributable to certain design and construction measures incorporated into development projects. The 3,000 $MTCO_{2e}$ per year value is used in defining small projects that are considered less than significant and do not need to use the Screening Tables or alternative GHG mitigation analysis. In tandem with being below the 3,000 $MTCO_{2e}$ per year value, small projects must match or exceed Title 24 energy efficiency requirements and match water conservation measures part of the California Green Building Standards Code. The Good Hope-Olive Storm Drain Project does not have elements that are subject to Title 24 requirements or Green Building Standards. As shown above, the Project would generate less than 3,000 $MTCO_{2e}$ per year during construction and operation and is therefore not subject to the required efficiency measures for small projects. Therefore, the Project would comply with the emissions reduction targets in the County's GHG Plan and would not conflict with an adopted plan, policy, or regulation pertaining to GHGs, therefore no impacts would occur.

4.8.3 Mitigation Measures

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

4.9 Hazards and Hazardous Materials

4.9.1 Environmental Setting

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

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

Pursuant to Government Code Section 65962.5, both the Department of Toxic Substances Control (DTSC) and the State Water Resources Control Board (SWRCB) are required to maintain lists of sites known to have hazardous substances present in the environment. Both agencies maintain up-to-date lists on their websites. The Project area is not listed by the DTSC or SWRCB as a hazardous substances site pursuant to Government Code Section 65962.5 ("Cortese List"). A search of the DTSC and SWRCB lists identified no open cases of hazardous waste violations within the Project area (DTSC 2023; SWRCB 2023).

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

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

Construction of the Project will result in the generation, transport, and use of various waste materials that will require recycling and/or disposal. Some waste generated will likely be classified as hazardous wastes/hazardous materials. Hazardous materials typically consist of chemicals that may be categorized as toxic, corrosive, flammable, reactive, an irritant, or strong sensitizer. During construction, the Project will potentially use hazardous materials from petroleum-based fuels, lubricants, cleaning products, and other similar materials. The quantities of the chemicals that will be present at the Project area would be limited and temporary.

During ongoing operations of the Project area, potentially hazardous materials such as grease, oils, cleaning products, fuel, and other similar materials will involve routine use, handling, and disposal. However, the listed materials above will not create a significant hazard to the public or the environment because the handling, storage, and disposal of these materials during construction and operations shall be done in compliance with the manufacturer's standards for storage and spill procedures, and with existing regulations such as the California Health and Safety Code, Hazardous Materials Transportation Act, and Resource Conservation and Recovery Act. Impacts would be less than significant.

The construction phase of the Project will include the transport, storage, and short-term use of petroleum-based fuels, lubricants, pesticides, and other similar materials. BMPs stipulating proper storage of hazardous materials, equipment, and site maintenance during construction are included as part of the Stormwater Pollution Prevention Plan (SWPPP). All transport, handling, use, and disposal of substances such as petroleum products and solvents related to the operation and maintenance of the Project would comply with all federal, state, and local laws regulating the management and use of hazardous materials. The Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous material. Impacts would be less than significant.

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

Any hazardous materials used during construction of the Project will be transported, handled, used, and disposed of in accordance with all federal, state, and local laws regulating the management and use of hazardous materials. BMPs listed in the SWPPP will be implemented to prevent construction pollutants and products from violating any water quality standards or waste discharge requirements. Impacts would be less than significant.

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

The nearest school to the Project area is Good Hope Elementary, located approximately 1 mile from the most northern section of the Project location at Mountain Avenue and Read Street (Google Maps 2023). As previously discussed, any use and transport of hazardous or potentially hazardous materials will be done in compliance with federal, state, and local laws regulating the management and use of hazardous materials. Additionally, the Project will implement the necessary BMPs and controls to minimize the spread of materials in the event of a spill. Therefore, with implementation of the Project BMPs and given that there are no schools within a quarter mile of the Project area, no impacts would occur.

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

A review of the DTSC's EnviroStor database indicated that the Project area is not located on any identified hazardous materials sites (DTSC 2023). In addition, a review of the SWRCB's Leaking Underground Storage Tank (LUST) GeoTracker database indicated that no listed hazardous materials sites are within or near the Project area. The EPA's EnviroMapper indicated that there are two sites found near the Project along Steele Peak Drive, which is the location of the proposed storm drain improvements. The first site is the Goodmeadow Fire Station No. 9 and the second is the Goodmeadow Temporary Household Hazards Waste Collection Facility, both located at 21565 Steele Peak Drive.

The first site is reported as a LUST cleanup site that ended in 2005. The second site is listed as a collection center known to handle and house some hazardous materials (CalEPA 2023).

While hazardous waste facilities (active and inactive) are located near the Project area, the proposed activities of the Project are not expected to create a significant hazard to the public or environment because it would not involve ground-disturbing activities on these properties. Impacts would be less than significant.

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

No airports are within 2 miles of the Project. The nearest public airports to the Project area are Perris Valley Airport L65 (approximately 3.5 miles to the east) and Riverside Municipal Airport (approximately 16.5 miles to the north) (Google Maps 2023). Given the distance of the Project to the nearest airports, no safety hazards would exist for people residing or working within or near the Project area. No impact would occur.

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

Operation of the Project would not interfere with an adopted emergency response plan. However, the construction of the Project has the potential to interfere with emergency response access to areas near the Project area. The General Plan Safety Element identifies portions of I-215, SR-74, SR-79, SR-60, and side streets within the Good Hope Community as designated evacuation routes (County 2021).

According to the Safety Element, the Project is not identified to be in areas with evacuation constraints (having limited access to evacuation routes, such as neighborhoods with only one access point). While the Project is not located in an area with evacuation constraints, the Project will implement traffic control procedures prior to any lane closures to ensure proper access to residences and businesses by emergency vehicles during construction and to maintain traffic flow. Additionally, the Project does not propose any new operations that would require revisions to existing emergency plans such as the County Emergency Operations Plan prepared in 2019. Impacts to emergency access would be less than significant.

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

Unincorporated areas within Riverside County contain native vegetation such as chaparral, sage, and grassland that provide fuel to fires that could spread across large areas of land (County 2021). Riverside County Municipal Code Title 8, Chapter 8.32 outlines the County's Fire Code, which identifies the safeguards necessary to protect life and property from hazards, hazardous conditions, explosion hazards, and fire. Riverside County's Building and Safety

Department provides material and construction methods to address wildfire exposure. These include adequate ventilation, ignition-resistant materials, exterior designs, sprinkler systems, and other design and construction methods compliant with the California Building Code.

The Project is located within areas designated as Very High FHSZ and Moderate FHSZ, according to the Fire Hazard Severity Zones in the State Responsibility Area map (CAL FIRE 2023). The Project does not include construction of any habitable structures such as commercial, industrial, or residential facilities. Therefore, the Project would not expose new structures to wildland fires.

During construction, the presence of potentially hazardous materials and construction equipment within the Project area could create an environment with wildland fire potential. However, Riverside County, as well as the California Department of Forestry and Fire Protection (CAL FIRE), requires that construction projects comply with the Department of Industrial Relations (DIR) Construction Safety Orders for Fire Protection and Prevention (Subchapter 4, Article 36). These general construction standards implemented to prevent fire from occurring during construction include general construction site layouts, including parking engine powered equipment away from combustible materials; providing adequate water supply; providing access to fire control devices; and identifying proper handling of flammable and combustible materials. These standards would be implemented by the on-site contractor.

While the Project is located within a Very High to Moderate FHSZ, the Project would not involve development of commercial, industrial, or residential structures that would expose structures to wildlife fires. Construction practices part of the Project will comply with state and local requirements for fire safety. Once the Project is completed, any on-site maintenance will continue to implement fire safety procedures, including proper use and storage of flammable equipment, parking of engine powered vehicles, and cleanup of accumulated debris, therefore, impacts would be less than significant.

4.9.3 Mitigation Measures

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

4.10 Hydrology and Water Quality

4.10.1 Environmental Setting

Hydrology Features

The Project is located within the Railroad Canyon Reservoir-San Jacinto River watershed. The San Jacinto River watershed within Good Hope is bordered to the south by Lake Elsinore and the Temescal Mountains, to the west by Lake Mathews, Temescal Valley, and the Santa Ana Mountains, to the north by Box Spring Mountain, and to the east by Perris Valley and the city of Perris. The Lower and Middle San Jacinto Rivers are the major water sources for the watershed, which drain into the San Jacinto River and Lake Elsinore. The headwaters of the San Jacinto River are in the San Bernardino Mountains. The Project area primarily receives water from the Santa Ana Mountains to the west, as well as nuisance flow from the surrounding residential properties. Water flows through several ephemeral drainages within the Project area; however, all the drainage features within the Project area have been heavily altered as a result of residential developments, and no direct connectivity to any downstream features was observed. Surface waters within the Project area do not exhibit a direct surface connection to the San Jacinto River or any of its tributaries (Appendix C).

Drainage Features

The Project area has three ephemeral drainages that have defined channel beds and banks but lack any riparian habitat and flow via surface hydrology, except during seasonal rainfall events. The mapped drainages can be found in Appendix C.

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

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

Impacts related to water quality would be categorized under short-term, construction-related impacts and long-term operational impacts. Construction-related activities have the potential to degrade surface and groundwater quality by exposing soils to surface runoff from debris and other materials, including runoff from various construction equipment. Pollutants of concern during typical construction activities include sediments, dry and wet solid wastes, petroleum products, solvents, cleaning agents, and other similar chemicals. During ground disturbing activities, excavated soil would be exposed thereby creating a potential for soil erosion. During a storm event or water spill, these pollutants and soils could be spilled, leaked, or transported as runoff into drainages or downstream waters, and potentially into receiving waters.

The Project would implement BMPs identified in the SWPPP to prevent pollutants that may violate water quality or water discharge requirements during construction and operation of the Project. As listed in the Project's Environmental Packet:

> Construction would occur within existing paved roadways or dedicated areas to the extent feasible. Each inlet and basin facility would incorporate as little impervious area as possible. Preservation of existing natural areas and stream courses will occur as localized drainage, and as localized drainage will still flow within existing well-defined flow paths. The basin site would allow dry weather low flows to be routed through an infiltration trench to benefit water quality downstream. All storm event flows shall discharge from the Project area in an effort maintain existing inflow to the impaired water bodies.

During Project operations, the existing drainage features would continue to collect, convey, and discharge runoff that may contain pollutants/contaminants that would affect water quality. To ensure that the Project would not degrade water quality, the Project will comply with the RWQCB's NPDES, Santa Ana Region MS4 Permit, (Order No. R8-2010-0033, NPDES Permit No. CAS618033). The MS4 Permit requires permittees to develop a standard design and post-development BMP guidance for the application of Low Impact Development (LID) BMPs to the maximum extent practicable (MEP) on streets, roads, or highways under the jurisdiction of the Permittees. The Santa Ana Region MS4 Permit Program prepared the Low Impact Development: Guidance and Standards for Transportation Projects ("Guidance") to provide direction on how Transportation Project owners and operators should address MS4 requirements for public works Transportation Projects within their jurisdiction. The project-specific Transportation Project Guidance (TPG) shall be implemented for the Project, and has been included with this document as Appendix G.

The extent of the pollutants would vary based on several factors such as rainfall and types of pollutants. Therefore, the SWPPP would identify specific methods including but not limited to runoff control, sediment control, general housekeeping, sediment, and debris removal, scheduled maintenance, and scheduled inspections. Mandatory compliance with the Project BMPs would result in less than significant impacts by complying with the discharge requirements during short-term construction and long-term operational activities (District 2021). In addition, the District will implement the following standard operating procedures to protect water quality:

Implementation of Water Quality Best Management Practices. All BMP materials are to be onsite prior to maintenance activity and ready for use. BMPs shall be in compliance with all specifications governing the proper design, installation, operation, and maintenance of such management practices.

Equipment Staging and Maintenance. All fueling, lubrication, maintenance, storage, and staging of vehicles and equipment shall be outside of Waters of the State and shall not result in a discharge or a threatened discharge to Waters of the State.

Therefore, Project activities will continue to be conducted in accordance with any applicable SWRCB and/or any RWQCB requirements.

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

The Project consists of drainage improvements to alleviate flooding issues within the Project area. The drainage improvements would safely convey stormwater flows to the proposed basin, which would eliminate significant surface drainage from encroaching through the existing residential properties during storm events. The work proposed will not require withdrawal of groundwater, or construction of large areas of paved surfaces, such as parking lots, that could impede groundwater recharge. Because there are no proposed activities that would substantially decrease groundwater recharge, no impacts would occur.

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

Drainage patterns are typically formed by streams, rivers, lakes, or other bodies of water. Over time the system is formed via a network of channels and tributaries that are determined by the type of geologic features specific to a landscape.

i) The Project would improve the existing drainage systems to alleviate flooding issues within the Project area. The Project would safely convey stormwater flows to a basin that would eliminate significant surface drainage from encroaching through the existing residential properties during storm events. During construction, ground-disturbing activities would occur that could result in substantial erosion or siltation. As discussed in Section 4.7: Geology and Soils and in the previous section a), the Project would implement BMPs, including erosion control plans to minimize erosion potential and water quality degradation. Additionally, without implementation of the Project, the Project area would continue to experience significant erosion and siltation during storm events due to the lack of infrastructure in the area to manage flooding. The Project would provide a beneficial impact in addressing erosion and siltation to the Project area. Impacts would be less than significant.

ii) The Project area currently experiences significant runoff which results in flooding at the existing residential properties. The Project would improve the existing infrastructure to alleviate flooding issues during storm events, thereby reducing the rate of surface runoff by safely redirecting stormwater flows away from the residential properties. The Project would provide a beneficial impact to the area.

iii) During storm events residents within the Project area experience flooding issues. The Project proposes improvements to the existing drainage to provide flood protection by routing excess flows away from the residential properties and into the basin. With these proposed improvements, the Project would not contribute runoff which would exceed existing capacities; in fact, the Project would provide a beneficial impact by conveying stormwater flows to a new basin that would be able to accommodate anticipated flows.

Construction and operation of the Project could result in conveying polluted runoff, which would also vary based on the extent of the rainfall and type of pollutants present. However, as previously discussed, the Project will be required to implement and comply with Project BMPs to ensure compliance with the discharge requirements as noted in the NPDES. Impacts therefore would be less than significant.

iv) Due to the conditions of the Project area and its existing drainage, residents have experienced flooding issues during rain events. The Project consists of drainage improvements to address flooding issues by conveying the excess stormwater into the basin. The Project would result in a beneficial impact to the area.

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

Tsunamis are high sea waves typically caused by earthquakes and underwater landslides. Seiche zones occur in bodies of water (semi or fully enclosed) and are caused by strong winds or rapid changes in the atmosphere that push water from one end to another and typically act as a standing wave/oscillating body of water. Floods are an overflow of large bodies of water beyond its normal capacity. The Project is not located in, or in the proximity of either a tsunami or seiche hazard zone.

According to the MVAP, flood hazard zones are primarily located adjacent to Cajalco Creek and "most of the floodplains are concentrated in the lower, flatter lands within the City of Perris" (County 2021). The Project is located within Zone D, identified to be in an area of undetermined flood hazard (FEMA 2020). The Project area is not within a mapped inundation zone as it not located near any flood zones or large bodies of water. Further, the Project is primarily intended to reduce the potential for flooding of the residential area and to minimize flood hazards. The risk of release of pollutants would most likely be reduced by protecting these residences from flooding. Therefore, a less than significant impact would occur.

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

The Project intends to update the existing storm drains and inlets and construct a basin as a way to provide improved flood infrastructure within the Project area. The work proposed shall implement the BMPs identified in the SWPPP to prevent the Project from violating any water quality standards and discharge requirements. Therefore, construction and operation of the Project would not conflict or obstruct implementation of the local water quality control plan. No impact would occur.

4.10.3 Mitigation Measures

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

4.11 Land Use and Planning

4.11.1 Environmental Setting

The Project is located within the unincorporated community of Good Hope in Riverside County, east of SR-74 (Refer to Section 1.0 and Figure 1). The Project area is located within the MVAP with land uses within the Project boundary designated as Very Low Density Residential, with permitted uses of single-family residences, limited agriculture, intensive equestrian, and animal keeping (County 2018).

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

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

The Project consists of upgrading the existing inlets and storm drains and constructing a new basin within the Project area. The proposed work will primarily occur within the right of way and on District property. There is no proposed work that would result in a physical division of the community within the Project area, such as new construction of roadways. Paving and street improvements are limited to existing roadways and not considered to be a division of an established community. Due to the nature of the Project, it would not result in physically dividing an established community. No impact would occur.

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

The Project will provide storm drain and flooding infrastructure improvements to alleviate reoccurring flooding experienced by Project area residents. The proposed work does not include any modification of the existing land plans or policies. Infrastructure upgrades are not considered to be incompatible with activities in the area. Due to the nature of the Project, it would not result in conflicting with land use plans, policies, or regulations adopted. No impact would occur.

4.11.3 Mitigation Measures

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

4.12 Mineral Resources

4.12.1 Mineral Resources (XII) Environmental Checklist and Discussion

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

There are portions of lands within the MVAP that permit extraction of mineral resources. Land use designations that permit extraction activities include Rural Residential, Rural Mountainous, Rural Desert, Water, Rural, and Mineral Resources.

According to the County of Riverside General Plan Mineral Resource Zones map, the Project area is located within Mineral Resource Zone 3 (MRZ-3) (significance of mineral deposits undetermined) (County of Riverside 2015). The U.S. Geological Survey's Mineral Resources Online Spatial Data maps show that no properties found within the Project area has past or present mine producers and no prospect or occurrence of mineral resources (USGS 2023).

The Project would not include mining activities within the area. Therefore, because no properties are found to contain significant mineral resources and no mining extraction activities are proposed, the Project would not result in the loss of availability of a known mineral resource of value. No impact would occur.

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

Refer to Section 4.12.1 a) above. The Project would not result in the loss of locally important mineral resources because no designated areas within the immediate area contain mineral resources of value. No impact would occur.

4.12.2 Mitigation Measures

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

4.13 Noise

4.13.1 Environmental Setting

As outlined in the County's Noise Element and General Plan EIR, noise within Riverside County is generated by numerous sources. The primary existing noise sources within Riverside County include transportation facilities, such as airports, railroads, freeways, and highways; commercial, industrial/manufacturing; agricultural land uses;

recreational areas; construction; and other noise sources, such as shooting ranges, mining, and sand and gravel operations. Noise is also attributable to various machines, electronic amplification of music, and the sheer number of various power tools, machinery, televisions, and stereos throughout the population.

Noise-Sensitive Receptors

Noise-sensitive receptors are those land uses that require serenity or are otherwise adversely affected by noise events or conditions. These land uses include but are not limited to schools, libraries, churches, hospitals, and residential uses. In addition, many of the open space areas within the Riverside County have been set aside to preserve their serenity, as well as to preserve significant habitat areas, and should also be considered sensitive receptors (County 2002). The main existing noise sources within the Project area come from typical daily activities from residences and places of worship such as public gatherings and property maintenance, public facilities (e.g., fire station and community centers), and use of the existing roadways from various vehicles. Receptors near the Project area that would be considered noise-sensitive are residences and gathering places, such as places of worship, community centers, and schools.

Riverside County General Plan

County of Riverside Noise Ordinance No. 847 exempts noise produced by facilities owned or operated by a governmental agency and noise generated in the construction of capital improvement projects by a governmental agency. Additionally, the County of Riverside General Plan contains the following policies related to the effects of vibration to specific land uses relevant to the Project (County of Riverside 2015).

N 15.1 Restrict the placement of sensitive land uses in proximity to vibration-producing land uses. (AI 105)

N 15.2 Consider the following land uses sensitive to vibration:

- Hospitals;
- Residential Areas;
- Concert Halls;
- Libraries;
- Sensitive Research Operations;
- Schools; and
- Offices

N 15.3 Prohibit exposure of residential dwellings to perceptible ground vibration from passing trains as perceived at the ground or second floor. Perceptible motion shall be presumed to be a motion velocity of 0.01 inches/second over a range of 1 to 100 Hz.

4.13.2 Noise (XIII) Environmental Checklist and Discussion

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

Noise impacts from construction activities associated with the Project would be a function of the noise generated by construction equipment, equipment location, sensitivity of nearby land uses, and the timing and duration of the construction activities. Given that the Project would occur within a developed neighborhood within Good Hope, the Project would create a temporary increase in ambient noise levels.

Construction activity can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings near the construction site respond to these vibrations with varying results ranging from no perceptible effects at the lowest levels to slight damage at the highest levels.

County of Riverside Noise Ordinance No. 847 exempts noise produced by facilities owned or operated by a governmental agency and noise generated in the construction of capital improvement projects by a governmental agency. The District's Standard Operating Procedures limit construction between the hours of 7:00 A.M. and 3:30 P.M. Therefore, the Project would follow the most stringent noise limitations for private construction projects. Construction of the Project would result in noise levels generated by construction equipment; however, these would be temporary and would cease once completed. Operation of the Project would not generate a substantial increase in noise levels as the Project consists of improving the existing drainage systems within the Project area and would not involve installing any turbines, pumps, or other equipment. Therefore, Impacts would be less than significant.

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

Construction of the Project would involve the temporary use of large construction equipment, which would result in temporary vibrational noise. Vibrational noise is a concern when sensitive receptors are close to the vibration sources. The Project would be located within the ROW of existing streets, adjacent to residences, places of worship, and public facilities, which are considered noise-sensitive receptors as noted in the General Plan (County 2015). However, construction and operation of the Project would be limited to the daytime hours, consistent with the District's Standard Operating Procedures. Additionally, operation of the Project would not create new sources of ground-borne vibration. Impacts would be less than significant.

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

No airports are within 2 miles of the Project area. The nearest public airports to the Project area are Perris Valley Airport L65 (approximately 3.5 miles driving distance to the east) and Riverside Municipal Airport (approximately 16.5 miles driving distance to the north) (Google Maps 2023). Given the distance of the Project to the nearest airports, the Project would not result in exposing residents or workers to excessive noise levels. No impact would occur.

4.13.3 Mitigation Measures

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

4.14 Population and Housing

4.14.1 Environmental Setting

The Project area covers approximately 132 acres within the northeastern part of Good Hope, adjacent to the city of Perris (County 2015). Good Hope is a census-designated place (CDP) within Riverside County. A CDP is a statistical geography that represents closely settled, unincorporated communities locally recognized and identified by name. According to the U.S Census, the estimated population of Good Hope in 2020 was 9,468 persons (Census 2023).

4.14.2 Population and Housing (XIV) Environmental Checklist and Discussion

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

The Project does not include construction of new housing or businesses, or infrastructure that could result in unplanned population growth. The Project will upgrade the existing drainage systems, provide improvements to a portion of existing road right of way, and construct a new basin to address flooding within the Project area. Improvements to roads would not be an extension or change in existing road alignments. Such improvements merely are a modification including adding pavement, standard striping, and safety signage. No change in population growth is anticipated to result from either the road improvements or new drainage infrastructure. Because the Project is not creating unplanned population growth, no impacts would occur.

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

The Project consists of drainage and roadway improvements within existing ROWs and within District property and would not involve the removal of any existing houses that would require replacement housing; therefore, the Project will not displace a substantial number of people. No impact would occur.

4.14.3 Mitigation Measures

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

4.15 Public Services

4.15.1 Environmental Setting

Police Services

The Riverside County Sheriff's Department provides police protection services to the cities and unincorporated areas within Riverside County. The Sheriff's Department established criteria for staffing requirements in unincorporated areas of Riverside County. The criteria are one sworn officer per 1,000 population, one supervisor and support staff employee per seven officers, one patrol vehicle per three sworn officers, and one school resource officer per school

(County 2002). The nearest police station is the Perris City Police Department at 137 North Perris Boulevard in Perris, approximately a 4-mile drive north from the Project area (Google Maps 2023).

Fire Services

The Riverside County Fire Department operates 85 fire stations. A total of 51 of these stations, as well as 3 stations operated by the California Department of Forestry, are located within the unincorporated portion of Riverside County (County 2002). The nearest fire station is Riverside County Fire Station No. 9 located at 21565 Steele Peak Drive, which is within the Project boundary (Google 2023).

Schools

The nearest school to the Project area is Good Hope Elementary, located approximately 1.3-miles from the northernmost portion of the Project area, at Mountain Avenue and Read Street (Google Maps 2023). Good Hope Elementary is managed by the Perris Elementary School District, who also manage 10 other schools within Riverside County.

Parks

There are no designated parks within the Good Hope Community. Most designated parks are located to the north in the City of Perris and to the west in the Quail Valley area.

4.15.2 Public Services (XV) Environmental Checklist and Discussion

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

Fire and Police Protection

The Project would not result in substantial impacts to the service and operations of fire and police protection services, nor would it require expansion or new construction of their facilities. While Fire Station No. 9 is located along Steele Peak Drive, which is part of the drainage improvement alignment, the proposed work would occur within the existing ROW and would not block access to and from the fire station.

No proposed road closures would interrupt services, and construction activities would be temporary as detours will be implemented. Once completed, the Project will require maintenance by District staff. However, neither construction activities nor maintenance would result in the interruption of fire or police protection services. The purpose of the

Project is to provide improved infrastructure for flood protection to the Project area. Because the Project would not create the need for new facilities and would not result in interrupting existing services and extending response times, no impact would occur.

Schools

The Project would not include new housing or result in a substantial increase of new employment opportunities that would affect local school enrollment. No school facilities would be affected by the Project. No impact would occur.

Parks

No designated parks are within the Project area that would be affected by construction of the Project. Additionally, the Project would not involve new housing or result in substantial new employment opportunities that would necessitate the need for new parks. No impact would occur.

Other Public Facilities

The Project is not expected to induce population growth; therefore, there would be no additional demand for new schools, parks, or other public facilities including medical facilities. The Project would not result in the need for new or physically altered government facilities nor affect time or other performance objectives. No impact would occur.

4.15.3 Mitigation Measures

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

4.16 Recreation

4.16.1 Recreation (XVI) Materials Checklist

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

The Project consists of the improvement of the existing stormwater drainage, improvements to a portion of road right of way, and flood protection facilities. There are no proposed activities that would increase the use of neighborhood and regional parks. The Moses Schaffer Community Center on 21565 Steele Peak Drive provides residents access to facilities to host public events. While the Project's alignment includes Steele Peak Drive, construction and operation along this roadway would not result in interruption of use of the community center, nor would it block the entrances to the site. Additionally, there are no designated parks within the Project area. No impact would occur.

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

The Project will upgrade the drainage systems, improvements to a portion of road right of way, and include new construction of a basin to address flooding within the Project area. There is no proposed development that would involve building recreational facilities or require the expansion of recreational facility needs. The existing community center would not be affected during the Project's construction and operational activities. As such, the Project would not require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment. No impact would occur.

4.16.2 Mitigation Measures

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

4.17 Transportation

4.17.1 Transportation (XVII) Environmental Checklist and Discussion

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

The Project consists of upgrading the existing drainage systems, construction of a new basin, and paving and improvements a portion of existing road right of way within the project area. Collectively these facilities will improve the Project area's infrastructure and prevent flooding. The proposed work would occur within the existing ROW and on District property. Traffic impacts associated with the Project would mainly occur during the limited construction period. Any road closures will include detour routes to minimize delays in the area and allow access to residences. Once constructed, required facility maintenance activities would occur outside of the existing roadways, unless an immediate emergency is declared and/or lane closures are required, in which case the District would have a Traffic Control Plan in place as part of their standard procedures to reduce any disruption of traffic. Therefore, because the Project would neither result in significant impacts to the circulation of the area nor conflict with any existing plans, impacts would be less than significant.

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

CEQA Guidelines section 15064.3, subdivision (b) details the use of vehicle miles traveled (VMT) to assess the significance of transportation impacts. The Project meets the Governor's Office of Planning and Research's (OPR's) definition of a small project (less than 110 daily trips) and would be screened out of a VMT analysis:

Screening Threshold for Small Projects. Many local agencies have developed screening thresholds to indicate when a detailed analysis is needed. Projects not generating a potentially significant level of VMT or indicating consistency with a Sustainable Communities Strategy (SCS) or general plan, or projects generating or attracting fewer than 110 trips per day, generally are assumed to cause a less than significant transportation impact (OPR 2018).

The Project's traffic impacts would occur during the limited construction period and during occasional maintenance activities once completed. The Project consists of upgrading the existing drainage systems, improvements to a portion of road right of way, and new construction of a basin to improve the Project area's flooding infrastructure. The Project's increase in construction traffic would be short-term and limited to the construction phase. Therefore, the Project would not result in a permanent impact on VMT within the Project area. Further, the Project is not expected to induce population growth or result in the addition of residential or commercial uses that might generate additional vehicle trips or VMT in the area. Therefore, impacts would be less than significant.

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

The Project will not include any roadway reconfigurations that would create a new design feature to the area. Improvements to existing road right of way will not realign or reconfigure the streets affected. The presence of construction vehicles and drainage and inlet repair would introduce a new disturbance to the area, such disturbances would be temporary in nature, and the vehicles and construction equipment would be removed from the site. Additionally, the new basin is not designed in such a way that would create a hazard to commuters along the roadways. Based on the activities proposed at the Project area, impacts would be less than significant.

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

The Project consists of upgrading the existing drainage systems and new construction of a basin to improve the neighborhood's flooding infrastructure and road improvements to a small portion of the project area. While Fire Station #9 is located along Steele Peak Drive, the upgrades and maintenance along to drainage on this road would not result in blocking the path of emergency vehicles to enter or exit the lot. Additionally, the Project would be occurring within existing ROWs and District property. A temporary increase in traffic will result by way of vehicles entering and existing the Project site, however, construction and operation of the Project will include detour routes to minimize delays in the area that would result in inadequate emergency access. Therefore, the Project will not result in inadequate emergency access during construction or operation. Additionally, the District will have a Traffic Control Plan in place, when needed, as part of their standard procedures to reduce any disruption of traffic to a less than significant level.

4.17.2 Mitigation Measures

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

4.18 Tribal Cultural Resources

4.18.1 Environmental Setting

Assembly Bill 52. Pursuant to Assembly Bill 52 (AB 52) and Public Resources Code Section 21080.3.1, an AB 52 invitation to initiate Tribal consultation for the Project was sent on June 7, 2017, to Tribe(s)/Band(s) based on the traditional use area maps that were previously provided to the District. Tribe(s)/Band(s) contacted for AB 52 consultation responded to this request by either deferring their right to consult on the Project to Tribe(s)/Band(s) that are closer to the Project area, indicating that they did not have any additional information to provide regarding the Project area, or providing sufficient evidence of known Tribal Cultural Resources (TCRs) that occur within the Project vicinity and thus initiating formal consultation.

4.18.2 Tribal Cultural Resources (XVIII) Environmental Checklist and Discussion

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

i) Based on the surveys and review of historical documents and record search results, no CRHR or NRHP eligible resources were identified within the Project area. Additionally, the Project will not affect the eligibility of any structures or resources identified within the Project area for their inclusion onto the NRHP or the CRHR.

ii) Summary of AB 52 Consultation

AB 52 requires good faith consultation with California Native American tribes on the potential for impacts to TCRs. TCRs are defined by Public Resource Code (PRC) Section 21074 as "sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe" that are either "included or determined to be eligible for inclusion in the California Register of Historical Resources" or "included in a local register of historical resources". TCRs also include those resources determined by a lead agency in its discretion, supported by substantial evidence, to be significant. Additionally, PCR Section 21074 describes Tribal Cultural Landscapes (TCLs) as being considered "a tribal cultural resource to the extent that the landscape is geographically defined in terms of the size and scope of the landscape.

In accordance with the requirements of AB 52, the District sent Project notification letters to a list of California Native American tribes, which had previously submitted general consultation request letters pursuant to 21080.3.1(d) of the Public Resources Code. Of the Tribes contacted, consultation proceeded with the Pechanga Band of Indians (Pechanga).

Impact Analysis

Consultation under AB 52 and a Sacred Lands File search by the Native American Heritage Commission (NAHC) determined that TCR are present within the Project site. Public disclosure of protected TCR is prohibited by law, as such, details of the location of such resources were communicated in government-to-government consultation between the District and the Tribes. It is also possible that unknown buried TCR could be present within the area during ground-disturbing activities. Significant impacts may occur from the discovery of unknown TCR during ground disturbing activities from Project construction. Impacts to unknown TCR would be less than significant with the implementation of Mitigation Measures TCR-1 and TCR-2.

4.18.3 Mitigation Measures

MM TCR-1: **Tribal/Cultural Resources Treatment Plan (CRTP).** The District shall prepare a CRTP prior to ground disturbing activities. The CRTP shall be based on the final construction grading plans prepared by the District and may include requirements for preconstruction cultural sensitivity training, notification, and monitoring protocol. The CRTP will consider the concerns of the consulting Tribes and the consulting Tribes will have an opportunity to review and comment on the draft CRTP.

In the event that the consulting Tribe is not able to reasonably accommodate the District's requests and/or needs regarding monitoring, the District may proceed with Mitigation Measure TCR-2 as needed:

MM TCR-2: **Tribal/Cultural Resources Monitoring.** The District may, at its discretion, conduct Cultural Resources and/or Tribal Cultural Resources monitoring and/or reconnaissance of the Project site using a qualified archeologist who is not a Tribal monitor or representative of a Native American Tribe. This would occur only as needed during ground-disturbing construction activities.

4.19 Utilities and Service Systems

4.19.1 Environmental Setting

The Good Hope Community is within the District 4 service area of the Eastern Municipal Water District (EMWD), which provides water, wastewater, and sewer services to the area. EMWD provides drinking water service to retail customers located within the cities of Moreno Valley, Menifee, Murrieta, and Temecula, and in the unincorporated communities of Good Hope, Homeland, Lakeview, Mead Valley, Murrieta Hot Springs, Nuevo, Romoland, Valle Vista, and Winchester. EMWD provides wastewater services to approximately 239,000 customers within its service area and currently treats approximately 43 million gallons per day of wastewater at its four active regional water reclamation facilities through 1,813 miles of sewer pipelines (EMWD 2023).

Solid Waste

Commercial and residential municipal solid wastes are delivered to County landfills by waste hauling companies and self-haulers. For areas within the unincorporated portions of the County, waste hauling companies operate under franchise agreements with the Riverside County Health Department (County 2002). The nearest landfill to the Project area is the El Sobrante Landfill, run by Waste Management, approximately 22 miles driving distance to the west.

Electrical and Natural Gas Service

Electrical and natural gas services to customers are provided by Southern California Edison and the Gas Company, respectively.

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

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

The Project consists of upgrading the existing drainage systems and new construction of a basin to improve the Project area's infrastructure and prevent flooding. These improvements would alleviate flooding issues and convey flows safely through underground storm drain infrastructure and would reduce peak flow rates that traverse downstream to private properties.

The Project would occur within the existing ROW and within District property. Construction of these improvements and of the basin is not anticipated to require utility relocations and, therefore, would not be expected to interrupt existing utility services. If any utilities are determined to be affected by the project, the District would coordinate with the responsible company or owner and conduct the activity in such a manner as to minimize or avoid any interruption in service.

Additionally, the Project would not include any development of new residential, commercial, or industrial structures that would require new utility connections or a significant increase in storm drainage capacities. Therefore, because the Project would not require relocation or construction of new or expanded utility systems, as such any potential impact would be less than significant.

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

The Project does not include new development that would require additional permanent water supplies as there would not be a significant increase in water demand. Construction-related activities that would require water would be mostly utilized for dust suppression on-site. Operational uses are not expected to require significant water demand outside the need of water for maintenance purposes. New or expanded entitlements would not be required for either phase of the Project. Any subsequent development that occurs, if it occurs at all, would be subjected to a separate CEQA evaluation to determine appropriate availability of water supplies. A less than significant impact would occur.

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

The Project would improve the Project area's storm drain system. No new development is proposed that would increase wastewater production and require new wastewater treatment facilities. No impact would occur.

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

Solid waste generated by the Project is expected to be minimal due to the work proposed, additionally the Project is not developing facilities that would create a consistent stream of waste (such as a commercial or industrial business or a new residential development). The Project consists of improving the storm drain systems. Any solid waste generated in the area is likely to occur during construction with the use of equipment and other accessory materials. It is anticipated that the waste generated would be minimal and disposed of in an approved landfill or similar waste facility. The Project is not expected to impair any attainment of solid waste reduction goals. A less than significant impact would occur.

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

The Project would not result in the continuous generation of solid waste that would impair or conflict with solid waste reduction goals. Waste generated by the Project would comply with all applicable federal, state, and local statutes and regulations related to solid waste. No impact would occur.

4.19.3 Mitigation Measures

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

4.20 Wildfire

4.20.1 Environmental Setting

See response to Section 4.9.2 Hazards and Hazardous Materials part g).

4.20.2 Wildfire (XX) Environmental Checklist and Discussion

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

The Project is located within areas designated to be very high to moderate fire hazard severity zones (FHSZ) (CalFire 2023). Operation of the Project is not expected to substantially impair implementation of an emergency response of evacuation plan because the Project would require maintenance that would occur within existing ROWs and within District properties. Construction of the Project could interfere with emergency response access to and from the Project area, specifically with Fire Station No. 9. However, as discussed in Section 4.17: Transportation, any road closures will include detour routes to minimize delays in the area to prevent/minimize travel impacts through the Project area.

Additionally, should lane closures be required during the duration of construction or maintenance of the Project area, the District will have a Traffic Control Plan in place as part of their standard procedures to ensure proper access and circulation within the affected areas. Therefore, impacts, would be less than significant.

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

The Project would not include construction of new structures that would result in exposing the community within the Project area to pollutant concentrations from wildfires. During Project construction and operation, the presence of construction equipment, materials, and vehicles could create an environment that could trigger a wildfire, particularly in areas with dry vegetation during high heat periods. As discussed in Section 4.9: Hazards and Hazardous Materials, construction activities shall be required to comply with DIR and CAL FIRE general construction standards to prevent fires from occurring. These include but are not limited to providing construction site layouts; utilizing fire-suppression materials; ensuring safe handling and storage of flammable or combustible equipment; and other typical construction management processes. Compliance with these construction practices would result in less than significant impacts.

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

The Project would not require the installation or maintenance of additional infrastructure that would exacerbate fire risk resulting in temporary or ongoing impacts to the environment. There are no proposed infrastructures such as buildings, roads, or utilities, and any new construction would be limited to the basin or improvements to the inlets and drainage systems. No impact would occur.

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

The Project does not include the construction of any new buildings or facilities. The Project will construct flood infrastructure improvements to the area. Due to the nature and purpose of the proposed improvements, the Project will result in a beneficial impact to the area. No impacts are anticipated due to flooding or landslides as a result of postfire slope instability.

4.21 Mandatory Findings of Significance

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

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

The Project has the potential to adversely affect Biological Resources, Cultural Resources, and Tribal Cultural Resources during construction. With the adoption and implementation of the Mitigation Measures, resource impacts would be reduced to less than significant levels.

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

The Project would not occur simultaneously with other projects in the area that would result in a cumulative impact. The Project consist of improving flood infrastructure and is not introducing new land uses that would create cumulative effects to the area. The Project would not result in any impacts that would be significant after mitigation. With the mitigation measures listed in this Initial Study, impacts from the Project would not be cumulatively considerable.

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

Environmental effects that may cause substantial adverse effects on humans typically result from impacts to air quality and GHGs; noise; hazardous materials; ground shaking; hazardous design features with respect to transportation and roadway designs; and wildfire. The analysis of this document indicates that impacts would be less than significant to the environmental areas mentioned above and, therefore, would not cause substantial adverse impacts to human beings. Impacts would be less than significant.

SECTION 5.0 LIST OF PREPARERS

5.1 Riverside County Flood Control and Water Conservation District

Lead Agency

Jason Swenson, Environmental Project Manager

Sean Berriman, Associate Flood Control Planner

Estefania Solorio-Sanchez, Assistant Flood Control Planner

5.2 Chambers Group

CEQA Documentation/Air Quality/Biological Resources/Jurisdictional Delineation/Cultural Resources/Greenhouse Gas/Noise

Eunice Bagwan, Project Manager

Paul Morrissey, Director of Biology

Lucas Tutschulte, Cultural Resources Team Lead

James Westbrook, Air Quality/GHG Analyst, BlueScape Environmental

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 6.0 BIBLIOGRAPHY

California Air Resources Board (CARB)

2023 Overview: Diesel Exhaust and Health. https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health

California Department of Forestry and Fire Protection (CAL FIRE)

2023 Fire Hazard Severity Zones in State Responsibility Areas. Available online at: https://calfire-forestry.maps.arcgis.com/apps/webappviewer/index.html?id=4466cf1d2b9947bea1d4269997e86553

California Energy Commission (CEC)

2023 Energy Reports. Electricity Consumption by County. Available online at: https://ecdms.energy.ca.gov/elecbycounty.aspx

California Department of Transportation (Caltrans)

2023 California State Scenic Highways. Available online at: https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways

County of Riverside (County)

2002 General Plan Environmental Impact Report

2015 General Plan. Available online at: https://planning.rctlma.org/General-Plan-Zoning/General-Plan

2021 General Plan Safety Element. Available online at: https://planning.rctlma.org/Portals/14/genplan/2021/elements/Ch06_Safety_092821.pdf

2023 Riverside County eRED Program. Available online at: https://planning.rctlma.org/Home/Riverside-County-eRED-Program

Department of Conservation

2023 California Geological Survey Maps. Available online at: https://maps.conservation.ca.gov/cgs/EQZApp/app/

Department of Industrial Relations

2023 Construction Safety Orders for Fire Protection and Prevention. Available online at: https://www.dir.ca.gov/title8/sb4a36.html

Department of Toxic Substances Control (DTSC)

2023 EnviroStor. Accessed January 2023. https://www.envirostor.dtsc.ca.gov/public/

Eastern Municipal Water District (EMWD)

2023 Services. https://www.emwd.org/

Federal Emergency Management Agency (FEMA)

2023 Flood Map Service Center. Available online at: https://msc.fema.gov/portal/search?AddressQuery=theda%20street%20perris%20california#searchresultsanchor

Google

2023 Google Maps. https://www.google.com/maps

IPCC

2013 Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_all_final.pdf

2014 Climate Change 2014 Synthesis Report: Approved Summary for Policymakers. https://www.ipcc.ch/site/assets/uploads/2018/02/AR5_SYR_FINAL_SPM.pdf

Riverside County

2019 County of Riverside Climate Action Plan Update. https://planning.rctlma.org/Portals/14/CAP/2019/2019_CAP_Update_Full.pdf

Riverside County Flood Control and Water Conservation District

2021 Environmental Information Packet (EIP) for Good Hope–Olive Avenue Storm Drain, Stages 1 and 2; Proposed Project No. 4-0-00425

South Coast Air Quality Management District (SCAQMD)

2022 Air Quality Management Plan. final-2022-aqmp.pdf (aqmd.gov)

Southern California Association of Governments (SCAG)

2020 The 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy, Connect SoCal. https://scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal-plan_0.pdf?1606001176

State Water Resources Control Board (SWRCB)

2023 GeoTracker. Accessed January 2023. https://geotracker.waterboards.ca.gov/

U.S. Census

2023 Quick Facts. Good Hope CDP. Available online at: https://www.census.gov/quickfacts/fact/table/goodhopecdpcalifornia/PST045222?#PST045222

U.S. Department of Agriculture (USDA)

2023 Web Soil Survey. Available online at: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

U.S. Geological Survey (USGS)

2023 Mineral Resources Online Spatial Data Maps. Available online at: https://mrdata.usgs.gov/

USEPA

2022 Overview of Greenhouse Gases. https://www.epa.gov/ghgemissions/overview-greenhouse-gases

SECTION 7.0 LIST OF APPENDICES

Appendix A: CalEEMod Output

Appendix B: Habitat Assessment with a Jurisdictional Delineation (HA) (Jurisdictional Delineation superseded by Appendix C)

Appendix C: Updated Preliminary Jurisdictional Delineation (PJD)

Appendix D: Archaeological Survey Report (ASR)

Appendix E: Paleontological Survey Report (PSR)

Appendix F: Geophysical/Seismic Refraction Survey

Appendix G: Transportation Project Guidance (TPG)

APPENDIX A

Good Hope Olive Ave Storm Drain_022924 Custom Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Good Hope Olive Ave Storm Drain_022924
Construction Start Date	7/7/2025
Lead Agency	—
Land Use Scale	Plan/community
Analysis Level for Defaults	County
Windspeed (m/s)	2.50
Precipitation (days)	9.00
Location	33.75964794289652, -117.28068621102949
County	Riverside-South Coast
City	Unincorporated
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5520
EDFZ	11
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.21

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
Other Asphalt Surfaces	3.91	Acre	3.91	0.00	0.00	0.00	—	—

Other Non-Asphalt Surfaces	7.10	Acre	7.10	0.00	0.00	0.00	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

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

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	3.94	3.12	35.8	30.0	0.11	1.36	3.40	4.76	1.26	0.77	2.03	—	14,485	14,485	0.45	1.38	14,925
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.51	1.69	10.2	14.5	0.03	0.43	0.28	0.71	0.40	0.07	0.46	—	2,925	2,925	0.12	0.04	2,940
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.04	0.88	6.76	10.3	0.02	0.28	0.46	0.72	0.26	0.11	0.34	—	2,352	2,352	0.08	0.17	2,406
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.19	0.16	1.23	1.89	< 0.005	0.05	0.08	0.13	0.05	0.02	0.06	—	389	389	0.01	0.03	398

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	CO2e

Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	3.94	3.12	35.8	30.0	0.11	1.36	3.40	4.76	1.26	0.77	2.03	—	14,485	14,485	0.45	1.38	14,925
2026	1.46	1.23	9.45	14.8	0.03	0.39	0.28	0.67	0.36	0.07	0.43	—	2,941	2,941	0.12	0.04	2,957
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	1.51	1.27	10.2	14.5	0.03	0.43	0.28	0.71	0.40	0.07	0.46	—	2,925	2,925	0.12	0.04	2,940
2026	1.46	1.23	9.46	14.4	0.03	0.39	0.28	0.67	0.36	0.07	0.43	—	2,919	2,919	0.11	0.04	2,934
2027	1.41	1.69	8.92	14.3	0.03	0.36	0.28	0.64	0.33	0.07	0.40	—	2,914	2,914	0.11	0.04	2,928
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.79	0.65	6.52	6.73	0.02	0.25	0.46	0.72	0.24	0.11	0.34	—	2,352	2,352	0.08	0.17	2,406
2026	1.04	0.88	6.76	10.3	0.02	0.28	0.20	0.48	0.26	0.05	0.31	—	2,087	2,087	0.08	0.03	2,098
2027	0.04	0.06	0.25	0.40	< 0.005	0.01	0.01	0.02	0.01	< 0.005	0.01	—	70.7	70.7	< 0.005	< 0.005	71.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.14	0.12	1.19	1.23	< 0.005	0.05	0.08	0.13	0.04	0.02	0.06	—	389	389	0.01	0.03	398
2026	0.19	0.16	1.23	1.89	< 0.005	0.05	0.04	0.09	0.05	0.01	0.06	—	346	346	0.01	< 0.005	347
2027	0.01	0.01	0.05	0.07	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	11.7	11.7	< 0.005	< 0.005	11.8

3. Construction Emissions Details

3.1. Site Preparation (2025) - Unmitigated

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

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

Off-Road Equipment	0.12	0.10	1.28	2.38	< 0.005	0.04	—	0.04	0.03	—	0.03	—	382	382	0.02	< 0.005	384
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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.02	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.29	6.29	< 0.005	< 0.005	6.31
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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.04	1.04	< 0.005	< 0.005	1.04
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
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.09	0.09	1.54	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	282	282	0.01	0.01	286

Vendor	< 0.005	< 0.005	0.07	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	61.2	61.2	< 0.005	0.01	64.2
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
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	—	4.31	4.31	< 0.005	< 0.005	4.37
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.01	1.01	< 0.005	< 0.005	1.05
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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.71	0.71	< 0.005	< 0.005	0.72
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.17	0.17	< 0.005	< 0.005	0.17
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

3.3. Site Grading (2025) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.36	2.82	25.0	25.1	0.05	1.20	—	1.20	1.10	—	1.10	—	5,839	5,839	0.24	0.05	5,859
Dust From Material Movement	—	—	—	—	—	—	0.99	0.99	—	0.11	0.11	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.40	0.33	2.95	2.95	0.01	0.14	—	0.14	0.13	—	0.13	—	688	688	0.03	0.01	690
Dust From Material Movement	—	—	—	—	—	—	0.12	0.12	—	0.01	0.01	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.06	0.54	0.54	< 0.005	0.03	—	0.03	0.02	—	0.02	—	114	114	< 0.005	< 0.005	114
Dust From Material Movement	—	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.09	0.09	1.54	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	282	282	0.01	0.01	286
Vendor	< 0.005	< 0.005	0.07	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	61.2	61.2	< 0.005	0.01	64.2
Hauling	0.47	0.21	10.6	3.36	0.06	0.16	2.13	2.29	0.16	0.60	0.75	—	8,303	8,303	0.20	1.31	8,716
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.01	0.01	0.01	0.15	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	30.9	30.9	< 0.005	< 0.005	31.4
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	7.21	7.21	< 0.005	< 0.005	7.55
Hauling	0.05	0.02	1.32	0.40	0.01	0.02	0.25	0.27	0.02	0.07	0.09	—	979	979	0.02	0.15	1,026
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.12	5.12	< 0.005	< 0.005	5.19
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.19	1.19	< 0.005	< 0.005	1.25
Hauling	0.01	< 0.005	0.24	0.07	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	162	162	< 0.005	0.03	170

3.5. Construction (2025) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.42	1.19	9.99	13.3	0.03	0.43	—	0.43	0.40	—	0.40	—	2,605	2,605	0.11	0.02	2,614
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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.42	1.19	9.99	13.3	0.03	0.43	—	0.43	0.40	—	0.40	—	2,605	2,605	0.11	0.02	2,614
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
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.31	0.26	2.17	2.90	0.01	0.09	—	0.09	0.09	—	0.09	—	566	566	0.02	< 0.005	568

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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.05	0.40	0.53	< 0.005	0.02	—	0.02	0.02	—	0.02	—	93.7	93.7	< 0.005	< 0.005	94.0
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.09	0.09	1.54	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	282	282	0.01	0.01	286
Vendor	< 0.005	< 0.005	0.07	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	61.2	61.2	< 0.005	0.01	64.2
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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.10	1.17	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	259	259	0.01	0.01	262
Vendor	< 0.005	< 0.005	0.07	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	61.2	61.2	< 0.005	0.01	64.0
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.27	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	57.0	57.0	< 0.005	< 0.005	57.8
Vendor	< 0.005	< 0.005	0.02	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	13.3	13.3	< 0.005	< 0.005	13.9
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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.44	9.44	< 0.005	< 0.005	9.57
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.20	2.20	< 0.005	< 0.005	2.30
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

3.7. Construction (2026) - 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	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.37	1.15	9.30	13.3	0.03	0.39	—	0.39	0.36	—	0.36	—	2,605	2,605	0.11	0.02	2,614
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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.37	1.15	9.30	13.3	0.03	0.39	—	0.39	0.36	—	0.36	—	2,605	2,605	0.11	0.02	2,614
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
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.98	0.82	6.65	9.50	0.02	0.28	—	0.28	0.26	—	0.26	—	1,861	1,861	0.08	0.02	1,867
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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.18	0.15	1.21	1.73	< 0.005	0.05	—	0.05	0.05	—	0.05	—	308	308	0.01	< 0.005	309
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
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.08	1.44	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	276	276	0.01	0.01	280
Vendor	< 0.005	< 0.005	0.06	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	60.2	60.2	< 0.005	0.01	63.2
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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.09	1.09	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	254	254	< 0.005	0.01	257
Vendor	< 0.005	< 0.005	0.07	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	60.2	60.2	< 0.005	0.01	63.1
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
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.07	0.81	0.00	0.00	0.19	0.19	0.00	0.04	0.04	—	183	183	< 0.005	0.01	186
Vendor	< 0.005	< 0.005	0.05	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	43.0	43.0	< 0.005	0.01	45.1
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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.15	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	30.4	30.4	< 0.005	< 0.005	30.8
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	7.12	7.12	< 0.005	< 0.005	7.46
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

3.9. Construction (2027) - 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	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.33	1.11	8.78	13.3	0.03	0.36	—	0.36	0.33	—	0.33	—	2,605	2,605	0.11	0.02	2,614
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
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.07	0.10	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	20.4	20.4	< 0.005	< 0.005	20.5
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.38	3.38	< 0.005	< 0.005	3.39
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.08	1.00	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	249	249	< 0.005	0.01	252
Vendor	< 0.005	< 0.005	0.06	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	59.1	59.1	< 0.005	0.01	61.8
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
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.97	1.97	< 0.005	< 0.005	2.00
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.46	0.46	< 0.005	< 0.005	0.48
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

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.33	0.33	< 0.005	< 0.005	0.33
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.08	0.08	< 0.005	< 0.005	0.08
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

3.11. Paving & Site Cleanup (2027) - 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	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.81	0.68	5.86	8.45	0.01	0.23	—	0.23	0.21	—	0.21	—	1,276	1,276	0.05	0.01	1,280
Paving	—	0.93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.18	0.25	< 0.005	0.01	—	0.01	0.01	—	0.01	—	38.4	38.4	< 0.005	< 0.005	38.6
Paving	—	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.03	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.37	6.37	< 0.005	< 0.005	6.39
Paving	—	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
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.08	1.00	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	249	249	< 0.005	0.01	252
Vendor	< 0.005	< 0.005	0.06	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	59.1	59.1	< 0.005	0.01	61.8
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
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.60	7.60	< 0.005	< 0.005	7.70
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.78	1.78	< 0.005	< 0.005	1.86
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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.26	1.26	< 0.005	< 0.005	1.27
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.29	0.29	< 0.005	< 0.005	0.31
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

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	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	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	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	7/7/2025	7/14/2025	5.00	6.00	—
Site Grading	Grading	7/15/2025	9/11/2025	5.00	43.0	—
Construction	Building Construction	9/12/2025	1/4/2027	5.00	342	—
Paving & Site Cleanup	Paving	1/5/2027	1/19/2027	5.00	11.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Bore/Drill Rigs	Diesel	Average	1.00	8.00	83.0	0.50
Site Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Site Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Site Grading	Crawler Tractors	Diesel	Average	2.00	8.00	87.0	0.43
Site Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Site Grading	Rubber Tired Loaders	Diesel	Average	1.00	8.00	150	0.36
Construction	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Construction	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Construction	Pumps	Diesel	Average	1.00	8.00	11.0	0.74
Construction	Rubber Tired Loaders	Diesel	Average	2.00	8.00	150	0.36
Construction	Signal Boards	Diesel	Average	2.00	8.00	6.00	0.82
Construction	Cranes	Diesel	Average	1.00	8.00	367	0.29
Paving & Site Cleanup	Pavers	Diesel	Average	1.00	8.00	81.0	0.42

Paving & Site Cleanup	Rollers	Diesel	Average	3.00	8.00	36.0	0.38
Paving & Site Cleanup	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Paving & Site Cleanup	Skid Steer Loaders	Diesel	Average	1.00	8.00	71.0	0.37

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	20.0	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	2.00	10.2	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Site Grading	—	—	—	—
Site Grading	Worker	20.0	18.5	LDA,LDT1,LDT2
Site Grading	Vendor	2.00	10.2	HHDT,MHDT
Site Grading	Hauling	236	10.0	HHDT
Site Grading	Onsite truck	—	—	HHDT
Construction	—	—	—	—
Construction	Worker	20.0	18.5	LDA,LDT1,LDT2
Construction	Vendor	2.00	10.2	HHDT,MHDT
Construction	Hauling	0.00	20.0	HHDT
Construction	Onsite truck	—	—	HHDT
Paving & Site Cleanup	—	—	—	—
Paving & Site Cleanup	Worker	20.0	18.5	LDA,LDT1,LDT2
Paving & Site Cleanup	Vendor	2.00	10.2	HHDT,MHDT
Paving & Site Cleanup	Hauling	0.00	20.0	HHDT

Paving & Site Cleanup	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 (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	0.00	0.00	0.00	0.00	—
Site Grading	0.00	81,038	151	0.00	—
Paving & Site Cleanup	0.00	0.00	0.00	0.00	4.36

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
Other Asphalt Surfaces	3.91	100%
Other Non-Asphalt Surfaces	0.45	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2025	0.00	532	0.03	< 0.005
2026	0.00	532	0.03	< 0.005
2027	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	29.6	annual days of extreme heat
Extreme Precipitation	2.75	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	20.4	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	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	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	N/A	N/A	N/A	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	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	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	N/A	N/A	N/A	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 include implementation of 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	88.8
AQ-PM	53.0
AQ-DPM	12.3
Drinking Water	69.0

Lead Risk Housing	56.5
Pesticides	61.8
Toxic Releases	31.4
Traffic	4.60
Effect Indicators	—
CleanUp Sites	76.7
Groundwater	0.00
Haz Waste Facilities/Generators	16.6
Impaired Water Bodies	0.00
Solid Waste	52.9
Sensitive Population	—
Asthma	63.4
Cardio-vascular	89.1
Low Birth Weights	73.3
Socioeconomic Factor Indicators	—
Education	86.4
Housing	25.7
Linguistic	75.2
Poverty	81.1
Unemployment	92.2

7.2. Healthy Places Index Scores

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

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	19.56884383
Employed	4.606698319

Median HI	25.15077634
Education	—
Bachelor's or higher	17.50288721
High school enrollment	100
Preschool enrollment	62.33799564
Transportation	—
Auto Access	36.01950468
Active commuting	2.489413576
Social	—
2-parent households	33.36327473
Voting	8.199666367
Neighborhood	—
Alcohol availability	86.66752214
Park access	12.53689208
Retail density	3.220839215
Supermarket access	15.62941101
Tree canopy	3.772616451
Housing	—
Homeownership	63.13358142
Housing habitability	25.99769023
Low-inc homeowner severe housing cost burden	33.1707943
Low-inc renter severe housing cost burden	14.8209932
Uncrowded housing	23.61093289
Health Outcomes	—
Insured adults	11.03554472
Arthritis	0.0
Asthma ER Admissions	35.3

High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	36.0
Cognitively Disabled	13.7
Physically Disabled	11.3
Heart Attack ER Admissions	6.7
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	83.7
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	60.8
SLR Inundation Area	0.0
Children	67.0
Elderly	45.9
English Speaking	33.3
Foreign-born	57.7

Outdoor Workers	49.7
Climate Change Adaptive Capacity	—
Impervious Surface Cover	95.8
Traffic Density	16.5
Traffic Access	23.0
Other Indices	—
Hardship	86.7
Other Decision Support	—
2016 Voting	27.1

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	73.0
Healthy Places Index Score for Project Location (b)	10.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	Yes
Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

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

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	Other Asphalt surfaces includes street paving and storm drain. User Defined parking includes the basin structure, inlet structures, and miscellaneous grading.
Construction: Construction Phases	Updated Construction schedule dated Oct 27, 2023.
Construction: Off-Road Equipment	Construction equipment from updated information received Oct. 27, 2023.
Construction: Trips and VMT	From environmental information packet: - Total roundtrip hauling distance for soil export: 20 miles. One way trip is 10 miles - Number of construction personnel "would range from five to 20 individuals depending on the phase of construction." Used 20 worker trips per day for all phases to be conservative. - "Additional maintenance and/or delivery trucks travel to and from the staging areas between five times per week on average and up to 10 times a week during peak construction." Used 2 vendor trips per day for all phases to be conservative. - The default haul trip number in the site grading phase was used.
Construction: Paving	Other asphalt surfaces land-use incudes the street paving and storm drain (100% asphalt). Other non-asphalt surfaces land-use includes the basin, inlets, and miscellaneous grading (6.4% concrete).
Construction: Dust From Material Movement	It is conservatively assumed that all material is exported during the Site Grading phase.
Construction: On-Road Fugitive Dust	—

APPENDIX B

Habitat Assessment with a Jurisdictional Delineation for the Good Hope – Olive Avenue Storm Drain Project Assessor Parcel Numbers: 343-20-1002, 343-20-4005, 343-20-4006, 343-12-1010, 343-10-0006, 343-24-0006, 343-22-0026, 343-18-0009, 343-22-0025, 343-24-0005, 343-23-0001, 343-22-0028, 342-21-0005, 342-21-0040, 345-08-0070, 345-08-0071, 345-08-0072,345-08-0068, and 345-08-0067 (Total Area Surveyed: 73.16 Acres) in Riverside County, California
Steele Peak USGS 7.5-Minute Series Map
Township 5 South, Range 4 West Sections 2, 3, and 11

Prepared For:
Drew Marshall
Riverside County Flood Control and Water Conservation District
1995 Market Street
Riverside, California 92501
DMarshal@rivco.org

Prepared By:
Psomas
3 Hutton Centre Drive, Suite 200
Santa Ana, California 92707
Amber Heredia
Amber.Heredia@Psomas.com

Principal Investigator:
Psomas
3 Hutton Centre Drive, Suite 200
Santa Ana, California 92707
Sarah Thomas
Sarah.Thomas@Psomas.com

Survey Conducted By:
Allison Rudalevige
Sarah Thomas

Surveys Conducted On:
September 9, 2019

Report Date:
October 1, 2019
Revised December 11, 2019

CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

DATE: 12/11/2019 SIGNED: ____________________

TABLE OF CONTENTS

SECTION 1.0 COUNTY OF RIVERSIDE ATTACHMENTS

SECTION 2.0 HABITAT ASSESSMENT

LIST OF TABLES

LIST OF EXHIBITS

LIST OF APPENDICES

This page intentionally left blank

SECTION 1.0

COUNTY OF RIVERSIDE ATTACHMENTS

Attachment E-3

BIOLOGICAL REPORT SUMMARY SHEET

(Submit two copies to the County)

Applicant Name: Riverside County Flood Control and Water Conservation District

Assessor's Parcel Number (APN): 343-20-1002, 343-20-4005, 343-20-4006, 343-12-1010, 343-10-0006, 343-24-0006, 343-22-0026, 343-18-0009

APN cont. : 343-22-0025, 343-24-0005, 343-23-0001, 343-22-0028, 342-21-0005, 342-21-0040, 345-08-0070, 345-08-0071, 345-08-0072, 345-08-0068, and 345-08-0067

Site Location: Section: 2, 3, and 11 **Township:** 5 South **Range:** 4 West

Site Address: S of Terrace Ave., E of Allec Way, N of Sharp Rd., and W of Hwy 74 in Riverside County, CA

Related Case Number(s): ______ **PDB Number:** ______

CHECK SPECIES SURVEYED FOR	SPECIES or ENVIRONMENTAL ISSUE OF CONCERN	(Circle Yes, No or N/A regarding species findings on the referenced site)		
	Arroyo Southwestern Toad	Yes	No	N/A
✓	Blueline Stream(s)	Yes	No	N/A
	Coachella Valley Fringed-Toed Lizard	Yes	No	N/A
	Coastal California Gnatcatcher	Yes	No	N/A
✓	Coastal Sage Scrub	Yes	No	N/A
	Delhi Sands Flower-Loving Fly	Yes	No	N/A
	Desert Pupfish	Yes	No	N/A
	Desert Slender Salamander	Yes	No	N/A
	Desert Tortoise	Yes	No	N/A
	Flat-Tailed Horned Lizard	Yes	No	N/A
see note	Least Bell's Vireo	Yes	No	N/A
	Oak Woodlands	Yes	No	N/A
	Quino Checkerspot Butterfly	Yes	No	N/A
	Riverside Fairy Shrimp	Yes	No	N/A
	Santa Ana River Woolystar	Yes	No	N/A
	San Bernardino Kangaroo Rat	Yes	No	N/A
	Slender Horned Spineflower	Yes	No	N/A
	Stephen's Kangaroo Rat	Yes	No	N/A
✓	Vernal Pools	Yes	No	N/A
✓	Wetlands	Yes	No	N/A

CHECK SPECIES SURVEYED FOR	SPECIES or ENVIRONMENTAL ISSUE OF CONCERN	(Circle Yes, No or N/A regarding species findings on the referenced site)		
✓	Other: Riparian/Riverine (see note)	Yes	No	N/A
✓	Other jurisdictional waters	Yes	No	N/A
✓	Other fairy shrimp habitat	Yes	No	N/A
✓	Other burrowing owl habitat	Yes	No	N/A
✓	Other SKR Fee Area	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A

Species of concern shall be any unique, rare, endangered, or threatened species. It shall include species used to delineate wetlands and riparian corridors. It shall also include any hosts, perching, or food plants used by any animals listed as rare, endangered, threatened or candidate species by either State, or Federal regulations, or for Riverside County as listed by the California Department of Fish and Game Natural Diversity Data Base (NDDB).

I declare under penalty of perjury that the information provided on this summary sheet is in accordance with the information provided in the biological report.

10/2/2019

Signature and Company Name Report Date

10(a) Permit Number (if applicable) Permit Expiration Date

County Use Only

Received by:____**Date:**____________

PD-B#____

Habitat Assessment surveyed for the presence of Riparian/Riverine and associated species. A small patch of riparian scrub is present (0.13 acre) but is too small and isolated to provide habitat for Riparian bird species (i.e., least Bell's vireo, southwestern willow flycatcher, western yellow-billed cuckoo).

Attachment E-4

LEVEL OF SIGNIFICANCE CHECKLIST
For Biological Resources
(Submit Two Copies)

Case Number: ______ **Lot/Parcel No.** see attached ____________ **EA Number**_________

Wildlife & Vegetation

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

(Check the level of impact the applies to the following questions)

a) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state conservation plan?

☐ ☑ ☐ ☐

b) Have a substantial adverse effect, either directly or through habitat modifications, on any endangered, or threatened species, as listed in Title 14 of the California Code of Regulations (Sections 670.2 or 670.5) or in Title 50, Code of Federal Regulations (Sections 17.11 or 17.12)?

☐ ☐ ☐ ☑

c) 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. Wildlife Service?

☐ ☑ ☐ ☐

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident migratory wildlife corridors, or impede the use of native wildlife nursery sites?

☐ ☐ ☐ ☑

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

☐ ☑ ☐ ☐

f) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

☐ ☐ ☐ ☑

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

☐ ☐ ☐ ☑

Source: CGP Fig. VI.36-VI.40

Findings of Fact:
Jurisdictional waters under the regulatory authority of the USACE, the RWQCB, and/or the CDFW are present. Riparian/Riverine resources are present; however, there is no habitat for Riparian/Riverine associated bird species. Smooth tarplant is present but is an MSHCP Covered Species; no survey are required for Narrow Endemic or Criteria Area species. Chaparral sand-verbena (not covered by the MSHCP) has potential to occur. Burrowing owl has potential to occur. Nesting birds/raptors have potential to occur. The project is located in a SKR HCP Fee Area; however, the fee is not required for the District.

Mitigation:
Permits/certifications/agreements from the USACE, RWQCB, and the CDFW for impacts on jurisdictional areas are expected to be needed. A DBESP for Riparian/Riverine is expected to be needed. Focused surveys for burrowing and chaparral sand-verbena have been recommended; if present, mitigation may be required.

Monitoring Recommended:
A pre-construction survey for burrowing owl would be required regardless of the results of focused surveys. A pre-construction survey for nesting birds/raptors would be required prior to initiation of construction activities during the nesting season (February 1- June 30).

The Jurisdictional Delineation provided in this report has been superseded.

Please see the *Jurisdictional Delineation Report for the Good Hope-Olive Avenue Storm Drain Stages 1 and 2 Project* prepared by Chambers Group, Inc. in July 2024.

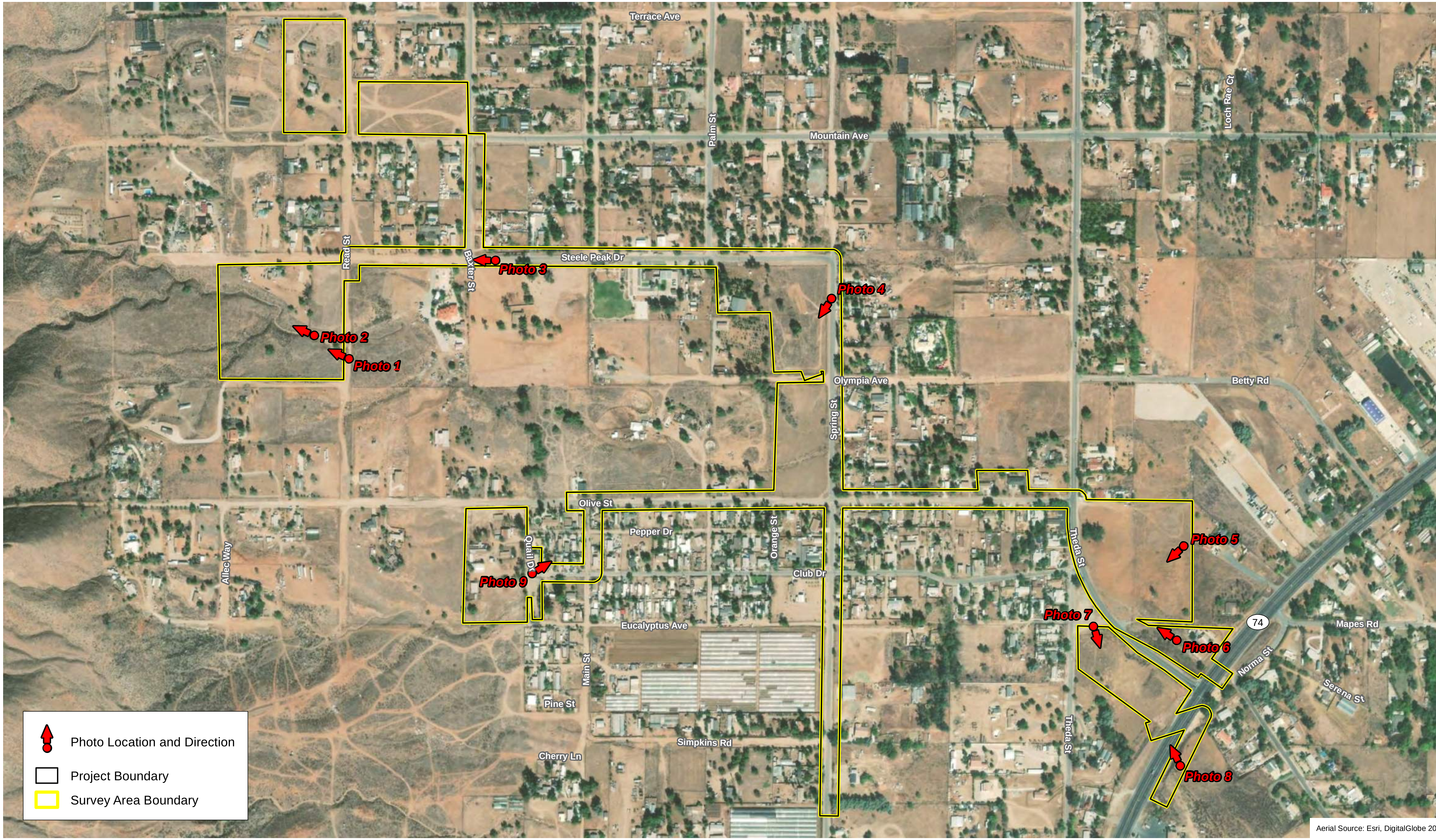


Photo Locations

Attachment E-6

Good Hope – Olive Avenue Storm Drain Project

N W E S

500 250 0 500 Feet

PSOMAS

(Rev: 9-18-2019 MMD) R:\Projects\2RIV\2RIV010103\Graphics\Habitat_Assessment\ex_Photo_Locations.pdf

Photo 1 - View of Riversidean sage scrub/non-native grassland in the western portion of the survey area. Photograph taken west of Read Street, facing west.

Photo 2 - View of Drainage 1 with Riversidean sage scrub/non-native grassland and sandy soil. Photograph taken west of Read Street, facing northwest.

Photo 3 - View of a developed roadway in foreground, exotic ornamental/developed adjacent to the roadway, and an access road mapped as bare ground in the background. Photograph taken from Steele Peak Drive, facing west.

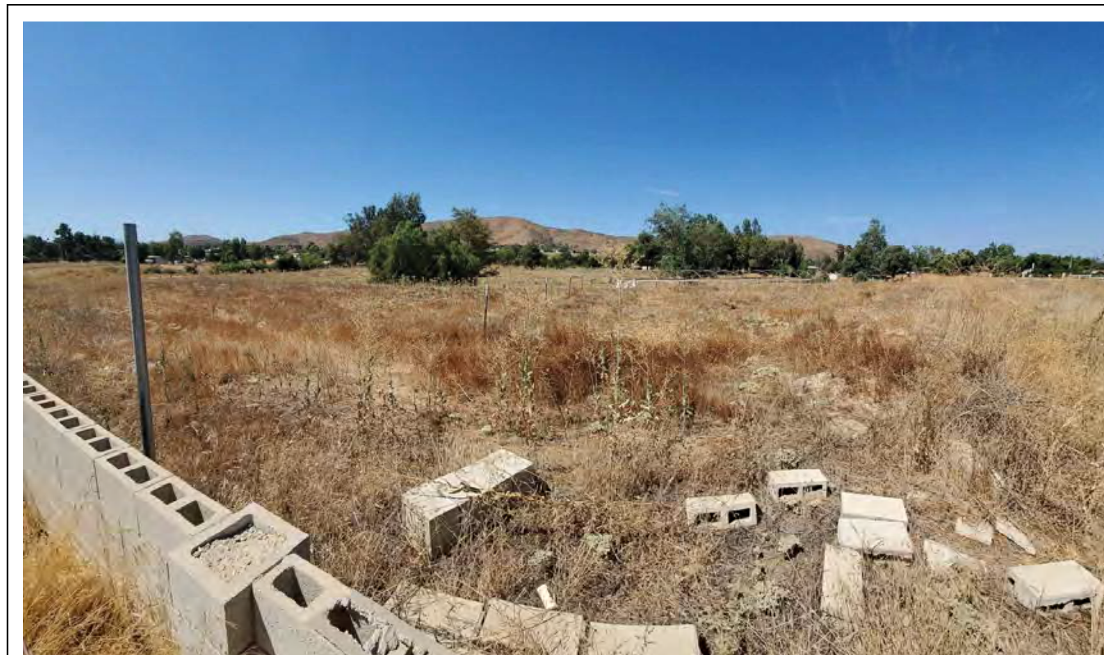


Photo 4 - View of ruderal in foreground with exotic ornamental in the background. Photograph taken west of Spring Street, facing southwest.

D:\Projects\2RIV\010103\GRAPHICS\AttE-6a_RepresentativePhotos_20191212.ai

Representative Photographs

Attachment E-6a

Good Hope – Olive Avenue Storm Drain Project

PSOMAS

(12/11/2019 MMD) R:\Projects\2RIV\2RIV010103\Graphics\Habitat_Assessment\Att_RepresentativePhotos.pdf

Photo 5 - View of tilled area mapped as ruderal east of Theda Street. Photograph taken east of Theda Street, facing southwest.

Photo 6- View of riparian scrub in Drainange 7 with adjacent Riversidean sage scrub/non-native grassland. Photograph taken east of Theda Street, facing northwest.

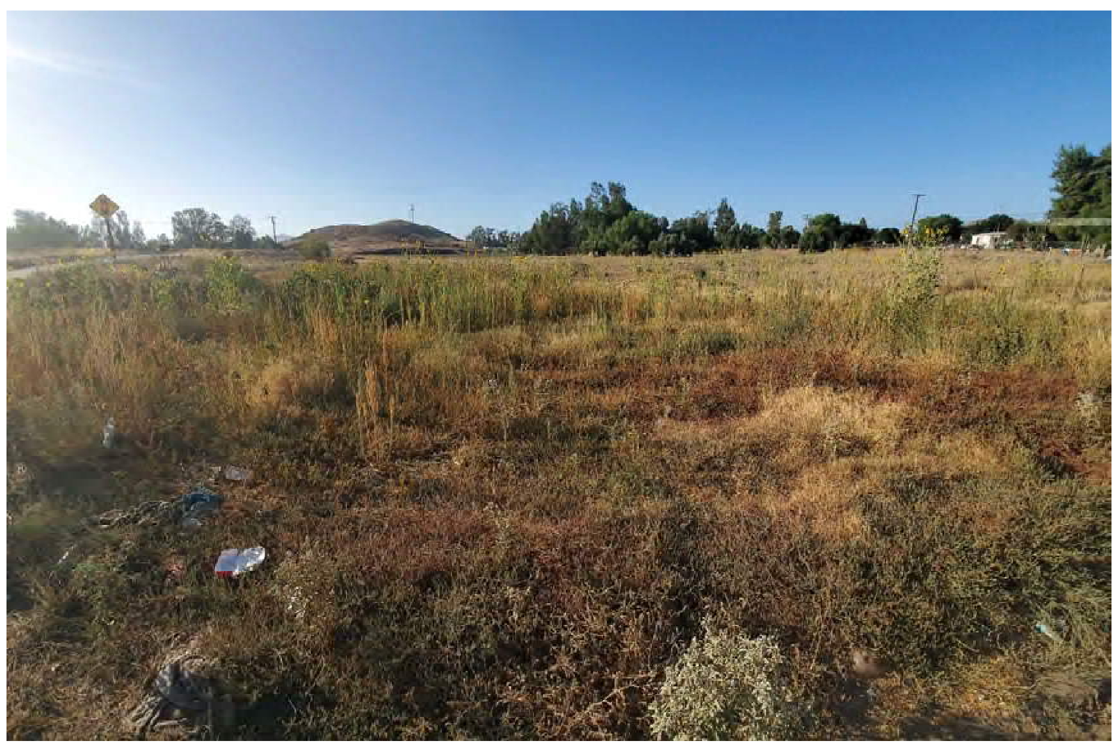


Photo 7 - View of ruderal in the eastern portion of the survey area. Photograph taken between the two branches of Theda Street, facing southeast.

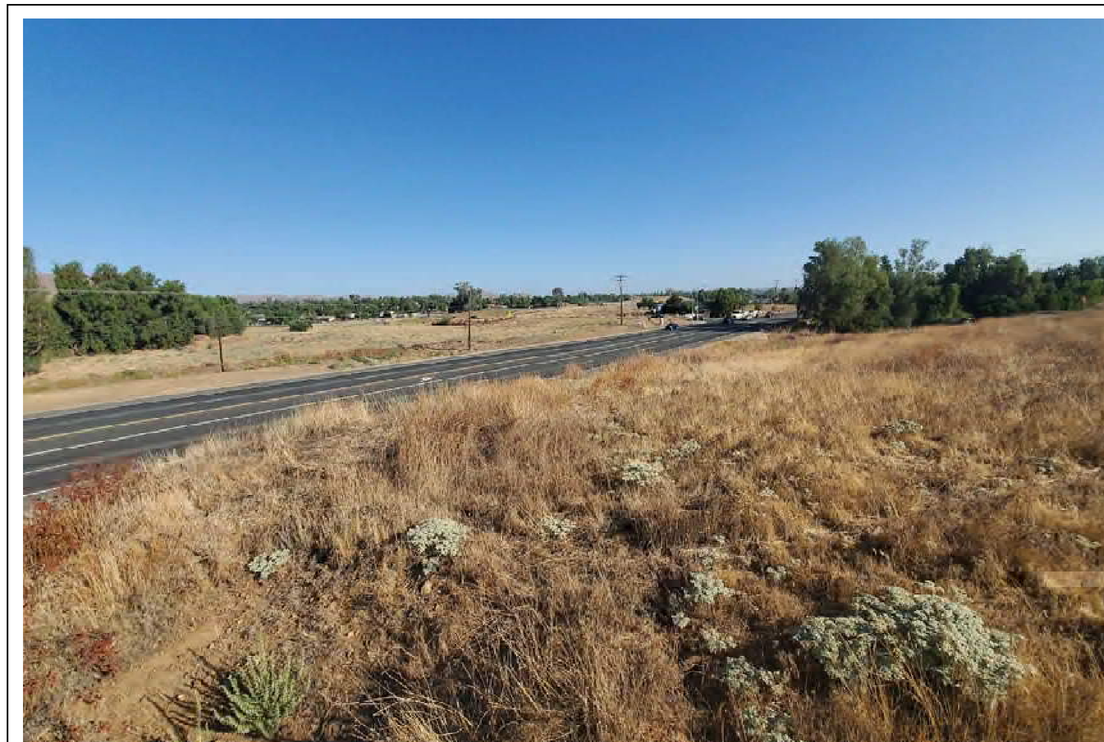


Photo 8 - Riversidean sage scrub/non-native grassland in foreground; Highway 74 (mapped as developed); and ruderal in the backround. Photograph taken east of Highway 74 facing north-west.

Representative Photographs

Good Hope – Olive Avenue Storm Drain Project

Attachment E-6b

PSOMAS

Photo 9 - View of an access road mapped as bare ground in the foreground and an empty lot mapped as ruderal. One smooth tarplant individual is visible in front of the fence under wood board.

Photo 10 - Smooth tarplant at Photo Location 9.

Photo 11 - Close up of smooth tarplant inflorescence at Photo Location 9.

D:\Projects\2RIV\010103\GRAPHICS\AttE-6c_RepresentativePhotos_20191001.ai

Representative Photographs

Attachment E-6c

Good Hope – Olive Avenue Storm Drain Project

PSOMAS

(12/11/2019 MMD) R:\Projects\2RIV\2RIV010103\Graphics\Habitat_Assessment\Att_RepresentativePhotos.pdf

SECTION 2.0

HABITAT ASSESSMENT

This report presents the findings of a habitat assessment and jurisdictional delineation for the Good Hope – Olive Avenue Storm Drain Project (hereinafter referred to as the "proposed Project") located in the unincorporated Good Hope area in western Riverside County, California.

PROJECT DESCRIPTION

The Good Hope area currently has very little flood control infrastructure. Flooding in residential areas occurs during periods of heavy rain. Notable flooding during storms in 2015 and 2017 led to community members petitioning the Riverside County Flood Control and Water Conservation District (District) for flood control improvements. In response to the community's needs, the District proposes to improve drainage in the area.

The proposed Project is in the early design stages. Preliminary plans primarily consist of a system of underground storm drains that would convey storm water out of residential areas and through an existing culvert under Highway 74. Storm drains are proposed in the right-of-way of existing roads including Olive Avenue, Spring Street, Steel Peak Drive, Baxter Street, Read Street, Pepper Drive, Quail Drive, and Theda Street. The alignment and size of each storm drain has not yet been determined. The storm drain system may also include a section of open channel between Steel Peak Drive and Spring Street.

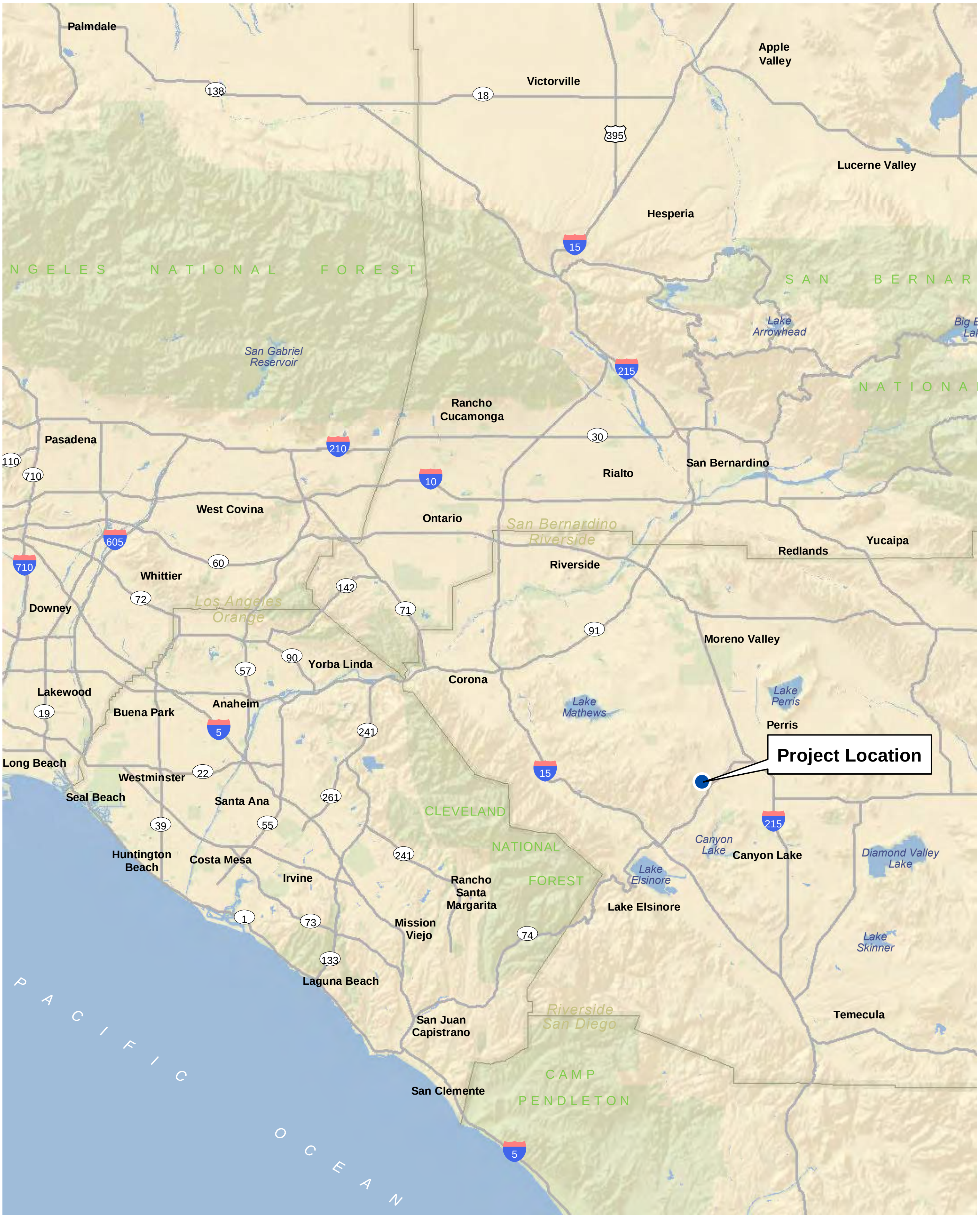
To facilitate storm water entering the system, multiple catch basins or inlets are proposed. Ten potential sites are being evaluated; however, it has not yet been determined which sites would be selected or what type of facility would be constructed at each site. Other Project improvements may include paving existing dirt roads and installing curb and gutter drainage along them.

PROJECT LOCATION

The proposed Project is located south of Terrace Avenue, east of Allec Way, north of Sharp Road, and west of Highway 74 in unincorporated Riverside County, California (Exhibits 1 and 2). The 73.16-acre survey area for the proposed Project includes all parcels and roadways that may be improved plus a 50-foot buffer along proposed underground storm drains, proposed open channels, and proposed inlet sites. The survey area includes Assessor Parcel Numbers (APNs) 343-20-1002, 343-20-4005, 343-20-4006, 343-12-1010, 343-10-0006, 343-24-0006, 343-22-0026, 343-18-0009, 343-22-0025, 343-24-0005, 343-23-0001, 343-22-0028, 342-21-0005, 342-21-0040, 345-08-0070, 345-08-0071, 345-08-0072, 345-08-0068, and 345-08-0067. Land uses in the vicinity consist of open space, residential, rural residential, agricultural, and transportation.

The survey area is depicted on the U.S. Geological Survey's (USGS') Steele Peak 7.5-minute quadrangle at Township 5 South, Range 4 West, Sections 2, 3, and 11 (Exhibit 3). Topography in the survey area is flat with elevations ranging from approximately 1,555 to 1,760 feet above mean sea level (msl). The area gently slopes to the southeast and contains several drainage features.

Twenty soil types occur in the survey area: Cajalco fine sandy loam (2 to 8 percent slopes, eroded); Cajalco fine sandy loam (8 to 15 percent slopes, eroded); Cieneba rocky sandy loam (15 to 50 percent slopes, eroded); Escondido fine sandy loam (2 to 8 percent slopes, eroded); Fallbrook sandy loam (8 to 15 percent slopes, eroded); Fallbrook fine sandy loam (2 to 8 percent slopes, eroded); Fallbrook fine sandy loam, shallow (8 to 15 percent slopes, eroded); Friant fine sandy loam (5 to 25 percent slopes, eroded); Garretson very fine sandy loam (2 to 8 percent slopes); Hanford coarse sandy loam (2 to 8 percent slopes); Honcut sandy loam (2 to 8 percent slopes); Las Posas loam (2 to 8 percent slopes); Lodo rocky loam (8 to 25 percent slopes, eroded); Monserate sandy loam (0 to 5 percent slopes); Monserate sandy loam (5 to 8 percent slopes, eroded); Monserate sandy loam (8 to 15 percent slopes, eroded); Terrace escarpments;



Regional Location

Exhibit 1

Good Hope – Olive Avenue Storm Drain Project

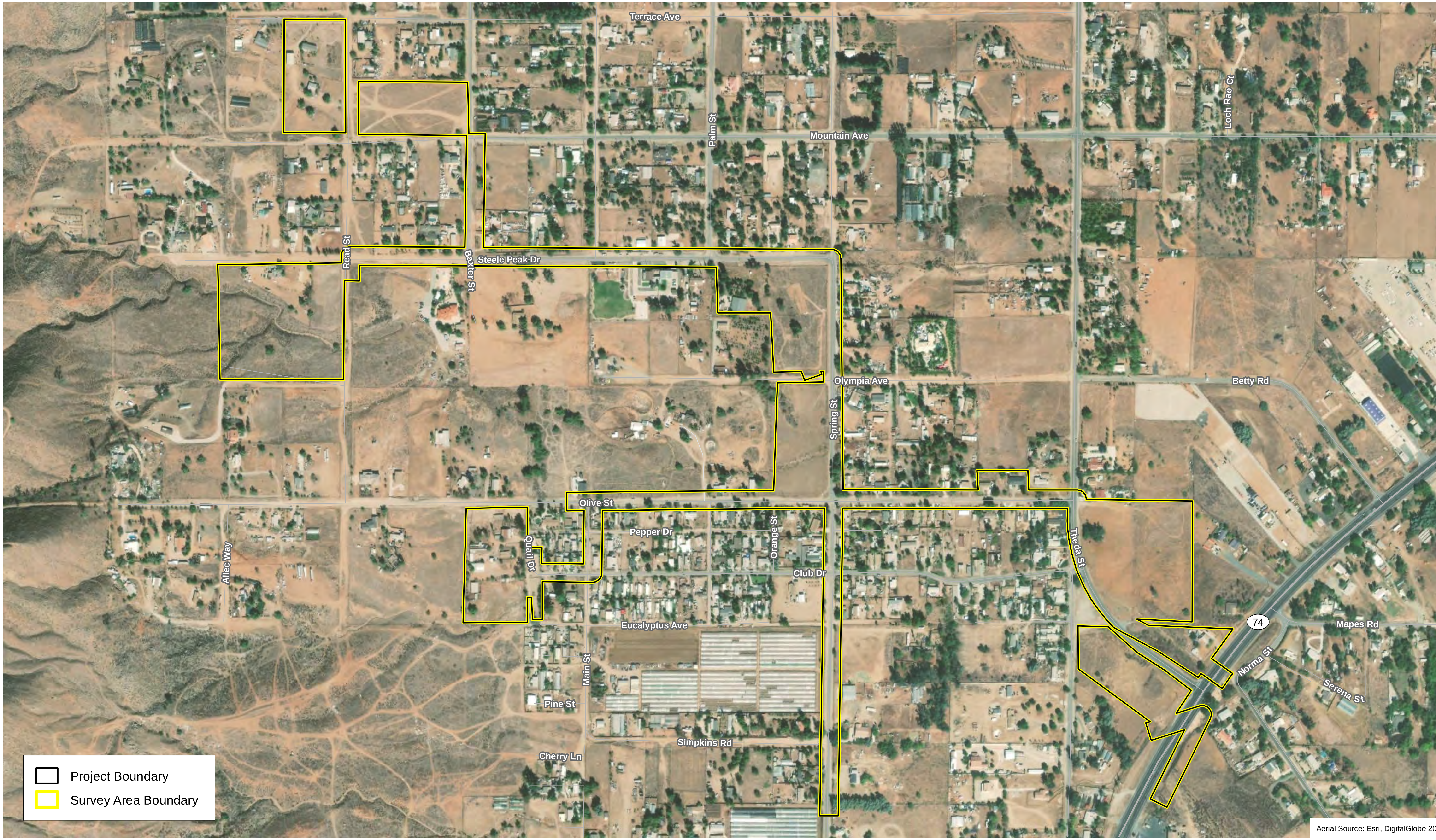
N W E S

10 5 0 10 Miles

PSOMAS

(Rev: 12-11-2019 RMB) R:\Projects\2RIV\2RIV010103\Graphics\ex_RL.pdf

D:\Projects\2RIV\010103\MXD\Habitat_Assessment\ex_RL_20191211.mxd



D:\Projects\2RIV010103\MXD\Habitat_Assessment\ex_ProjectLocation_20191211.mxd

Project Location

Good Hope – Olive Avenue Storm Drain Project

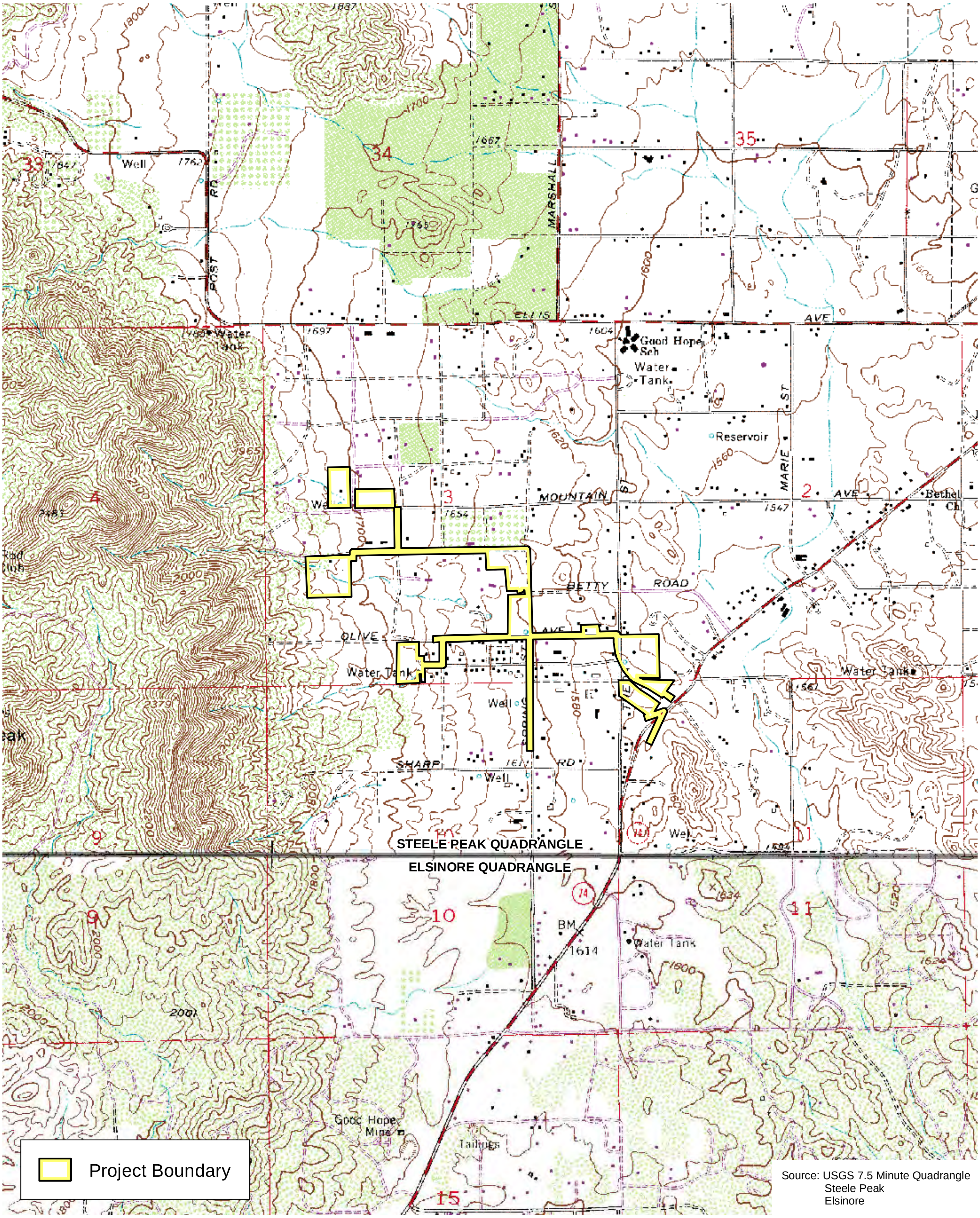
Exhibit 2

N W E S

500 250 0 500 Feet

PSOMAS

(Rev: 9-18-2019 RMB) R:\Projects\2RIV\2RIV010103\Graphics\Habitat_Assessment\ex_ProjectLocation.pdf



D:\Projects\2RIV\010103\MXD\ex_USGS_Quads_20190918.mxd

U.S. Geological Survey 7.5-Minute Quadrangle

Exhibit 3

Good Hope – Olive Avenue Storm Drain Project

N W E S

2,000 1,000 0 2,000 Feet

PSOMAS

(Rev: 9-26-2019 RMB) R:\Projects\2RIV\2RIV010103\Graphics

Vista coarse sandy loam (8 to 15 percent slopes, eroded); Yokohl loam (2 to 8 percent slopes); Ysidora gravelly very fine sandy loam (2 to 8 percent slopes) (Exhibit 4).

WESTERN RIVERSIDE MULTIPLE SPECIES HABITAT CONSERVATION PLAN

The Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) requires that project sites be evaluated for a number of factors to assess how they meet MSHCP criteria. This information is used to determine whether a project site should be acquired as part of the habitat reserve or whether it should be allowed for development. The biological resources evaluation also assists the Lead Agency in determining whether additional mitigation would be required for Criteria Area or Additional Survey Needs Species. According to the Riverside County Regional Conservation Authority MSHCP Information Mapping Application, the proposed Project is located within the Additional Survey Needs area for burrowing owl. The proposed Project is not located in any designated MSHCP “Criteria Area” Cells. The general habitat assessment for the proposed Project includes assessments for Riparian/Riverine areas (and associated species) and vernal pools (and associated species) pursuant to MSHCP Section 6.1.2; urban/wildlands interface issues pursuant to MSHCP Section 6.1.4; and areas under the jurisdictions of the U.S. Army Corps of Engineers (USACE) and/or the California Department of Fish and Wildlife (CDFW) as discussed in MSHCP Section 6.1.2. This report has been prepared in accordance with the MSHCP guidelines.

The proposed Project site is located in the MSHCP’s Mead Valley Plan. The target conservation acreage range for the Mead Valley Plan is 4,980 to 6,730 acres (Dudek 2003).

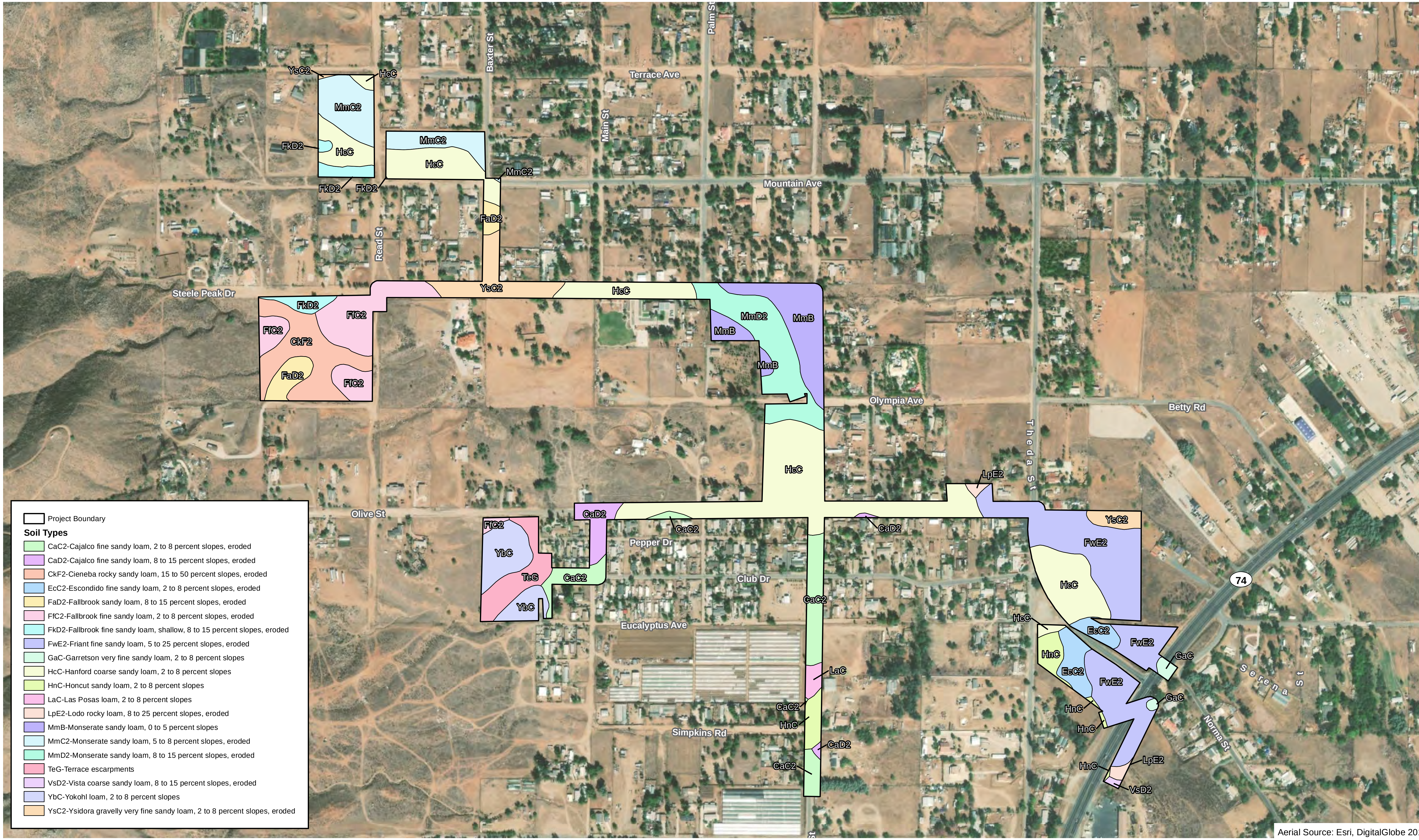
The proposed Project site occurs approximately 585 feet east of the Good Hope - East subunit which contains Criteria Cells 3268 and 3366 (Exhibit 5). Cells 3268 and 3366 contribute to assembly of Proposed Linkage 3. Proposed Linkage 3 is generally comprised of upland Habitats in the Gavilan Hills, Harford Springs and proposed North Peak Conservation Bank area under Public/Quasi-Public and private ownership. This Linkage is one of two connections between the Lake Mathews/Estelle Mountain Reserve and Core Areas in Alberhill (Dudek 2003). Conservation in Cells 3268 and 3366 will focus on coastal sage scrub, chaparral, and grassland habitat in the Steele Peak Reserve and adjacent areas. Conservation within this Cell Group will range from 45 to 55 percent of the Cell Group, focusing in the southern portion of the Cell Group.

METHODS

Vegetation Mapping and General Surveys

A literature review was conducted prior to the field survey to identify special status plant and wildlife species known to occur in the Project vicinity. The California Native Plant Society’s (CNPS’) Inventory of Rare and Endangered Plants (CNPS 2019) and the CDFW’s California Natural Diversity Database (CNDDB) (CDFW 2019a) were reviewed (USGS Steele Peak, Perris, Romoland, and Elsinore 7.5-minute quadrangles). The Riverside County Regional Conservation Authority MSHCP Information Mapping Application was reviewed to determine MSHCP requirements using APNs 343-20-1002, 343-20-4005, 343-20-4006, 343-12-1010, 343-10-0006, 343-24-0006, 343-22-0026, 343-18-0009, 343-22-0025, 343-24-0005, 343-23-0001, 343-22-0028, 342-21-0005, 342-21-0040, 345-08-0070, 345-08-0071, 345-08-0072, 345-08-0068, and 345-08-0067. In addition, the U.S. Department of Agriculture, Natural Resources Conservation Service’s (USDA NRCS’) Web Soil Survey for the Western Riverside Area was reviewed to determine whether suitable soils are present to support special status plant and wildlife species.

The habitat assessment was conducted on September 9, 2019, by Psomas’ Senior Botanist/Regulatory Specialist Allison Rudalevige and Psomas’ Wildlife Biologist Sarah Thomas.



D:\Projects\2RIV\010103\MXD\Habitat_Assessment\ex_Soils_20190925.mxd

Soil Types

Exhibit 4

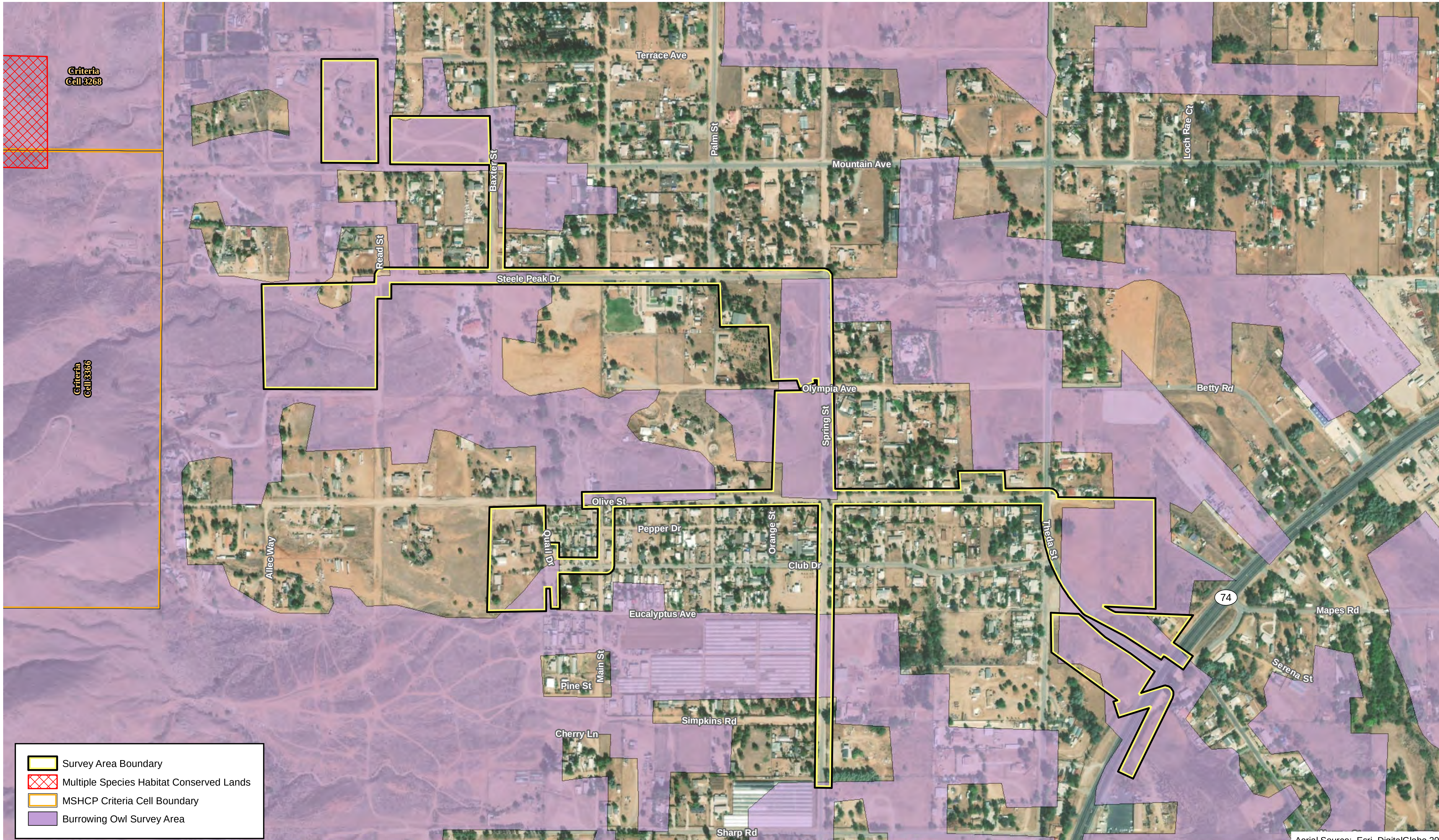
Good Hope – Olive Avenue Storm Drain Project

N W E S

550 275 0 550 Feet

PSOMAS

(Rev: 12-11-2019 RMB) R:\Projects\2RIV\2RIV010103\Graphics\Habitat_Assessment\ex_Soils.pdf



D:\Projects\2RIV010103\MXD\Habitat_Assessment\ex_MSHCP_20190918.mxd

Western Riverside County Multiple Species Habitat Conservation Plan

Exhibit 5

Good Hope – Olive Avenue Storm Drain Project

N W E S

550 275 0 550 Feet

PSOMAS

(Rev: 12-11-2019 RMB) R:\Projects\2RIV\2RIV010103\Graphics\Habitat_Assessment\ex_MSHCP.pdf

The weather was cloudy with a temperature of 75 degrees Fahrenheit and winds of 0–1 mile per hour. The habitat assessment was conducted by walking the survey area and recording plant and wildlife species observed. Vegetation was mapped in the field on an aerial photograph at a scale of 1-inch equals 100 feet (1″=100′). Vegetation types were mapped and generally follow categories outlined in the Western Riverside County MSHCP Habitat Accounts (Dudek 2003). Photographs were also taken during the habitat assessment; representative photographs are included in Attachment E-6.

All plant and wildlife species observed were recorded in field notes. Plant species were identified in the field or collected for later identification. Plants were identified using taxonomic keys in Baldwin et al. (2012), Hickman (1993), and Munz (1974). Nomenclature of plant taxa conform to the CDFW's *Special Vascular Plants, Bryophytes, and Lichens List* (CDFW 2019c) for special status species and Jepson eFlora (Jepson Flora Project 2019) for all other taxa.

All wildlife species detected during the surveys were documented in field notes. Active searches for reptiles and amphibians included lifting, overturning, and carefully replacing rocks and debris. Birds were identified using visual and auditory recognition. Surveys for mammals were conducted during the day and included searching for and identifying diagnostic sign, including scat, footprints, scratch-outs, dust bowls, burrows, and trails. Taxonomy and nomenclature for wildlife conform to the CDFW's *Special Animals List* (CDFW 2019b) for special status species; nomenclature for non-special status wildlife follows Collins and Taggart (2009) for amphibians and reptiles, American Ornithological Society (2018) for birds, and Smithsonian National Museum of Natural History (2011) for mammals.

Preliminary Jurisdictional Delineation

Ms. Rudalevige performed a preliminary jurisdictional delineation concurrently with the vegetation mapping. The preliminary jurisdictional delineation describes the type and extent of: (1) waters of the United States, including wetlands (if present), under the regulatory authority of the U.S. Army Corps of Engineers (USACE); (2) waters of the State under the regulatory authority of the Regional Water Quality Control Board (RWQCB); and/or (3) waters under the regulatory authority of the California Department of Fish and Wildlife (CDFW). Jurisdictional water resources were mapped on a 1-inch equals 100 feet (1″=150′) scale color aerial.

The delineation defined the USACE and RWQCB jurisdictional boundaries based on the Ordinary High Water Mark (OHWM). The presence or absence of wetlands within or adjacent to the OHWM were verified through the determination of the presence of (1) hydrologic conditions and (2) hydrophytic vegetation pursuant to the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (USACE 2008) and the 1987 Corps of Engineers Wetland Delineation Manual; a soil test pit documenting the presence of hydrophytic vegetation would only be dug if the other wetland indicators were present or if problematic situations were present. The limits of CDFW jurisdiction were mapped from the top of bank to the top of bank along the channel/drainage, or to the outer limits of riparian vegetation (outer dripline), whichever was greater.

Resources reviewed to assist in the assessment of potential jurisdictional waters included a soil map of the survey area (Exhibit 4), the USDA NRCS' Hydric Soils List (USDA NRCS 2019b), the National Wetland Plant List (Lichvar et al. 2016), and the USFWS' National Wetlands Inventory (NWI) Wetland Mapper (USFWS 2019).

On September 12, 2019, the Environmental Protection Agency and Department of the Army signed a final rule to repeal the 2015 Clean Water Rule (2015 Rule) and re-codify the regulatory text defining "waters of the United States" that existed prior to the 2015 Rule. The new regulations will go into effect on December 23, 2019. One of the proposed changes is that ephemeral features that contain water only during or in response to rainfall would no longer be considered "waters of the United States" under the jurisdiction of the USACE.

On August 28, 2019, the Office of Administrative Law approved the State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to "waters of the State". The procedures will go into effect on May 28, 2020. Under these new regulations, the State Water Resources Control Board and its nine RWQCBs will assert jurisdiction over all existing "waters of the United States", and all waters that would have been considered "waters of the United States" under the 2015 Rule. Thus, the "waters of the United States" that would no longer be under USACE jurisdiction would be under RWQCB jurisdiction.

EXISTING CONDITIONS

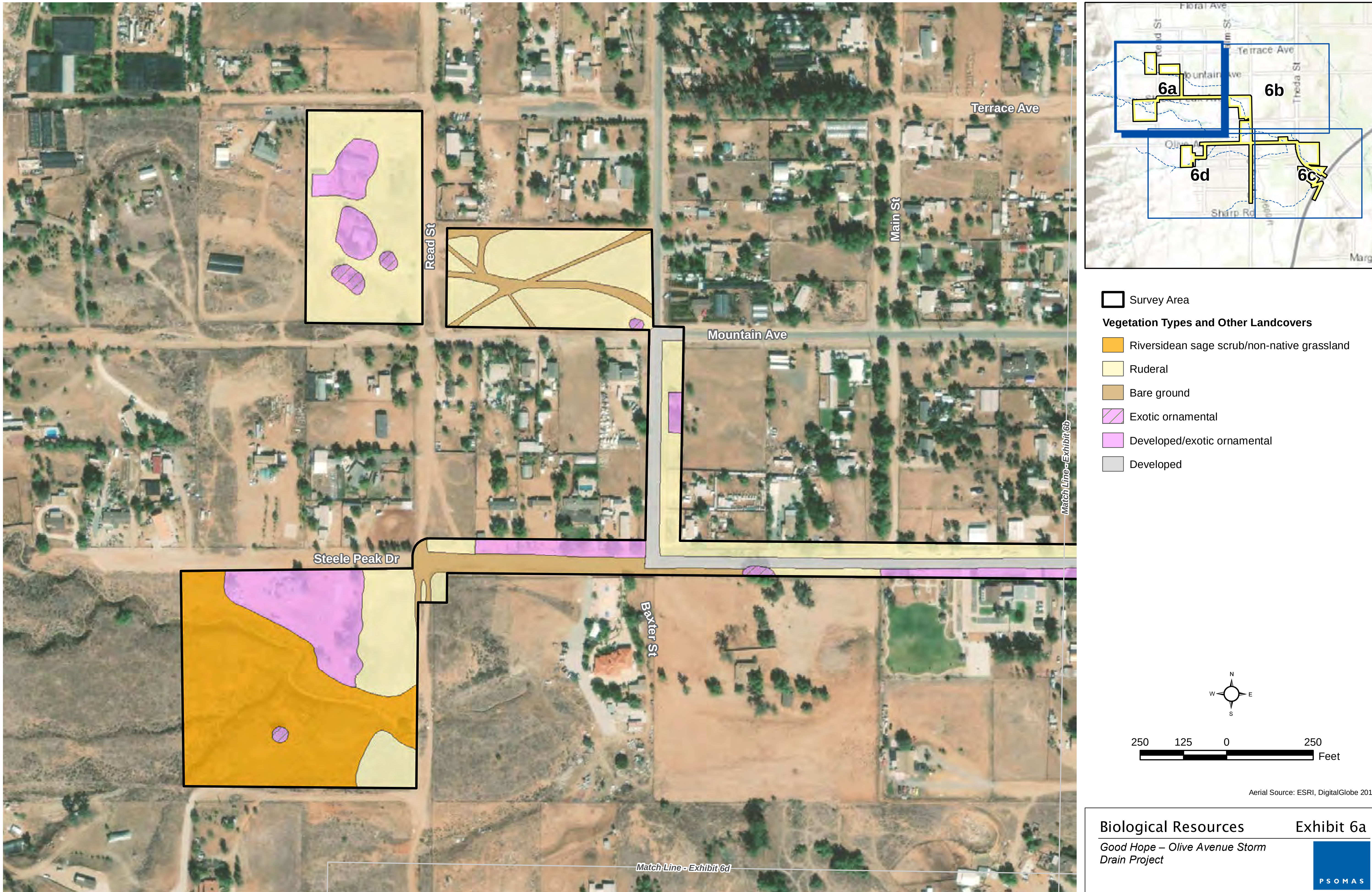
<u>Vegetation Types and Other Areas</u>

The following vegetation types and other landcovers occur in the survey area: Riversidean sage scrub/non-native grassland, riparian scrub, non-native grassland, ruderal, bare ground, exotic ornamental, developed/exotic ornamental, developed (Exhibit 6; Table 1).

TABLE 1
VEGETATION TYPES AND OTHER LANDCOVERS IN THE SURVEY AREA

Vegetation Type or Other Landcover	Amount in the Survey Area (acres)
Riversidean sage scrub/non-native grassland	6.53
Riparian scrub	0.13
Non-native grassland	0.38
Ruderal	38.52
Bare ground	3.11
Exotic ornamental	1.11
Developed/exotic ornamental	15.84
Developed	7.54
Total	**73.16**

Riversidean sage scrub/non-native grassland is present on the parcel southwest of Steele Peak Drive and Read Street, and on a few parcels adjacent to Theda Street. This vegetation type has a moderately high proportion of non-native grasses such as red brome (*Bromus madritensis* ssp. *rubens*) and wild oat (*Avena* spp.). The parcel southwest of Steele Peak Drive and Read Street is dominated by a mix of California buckwheat (*Eriogonum fasciculatum*), California sagebrush (*Artemisia californica*), and California brittlebush (*Encelia californica*). On the parcels near Theda Street, this vegetation type is dominated by California buckwheat. Other species occurring include cholla (*Cylindropuntia* sp.), vinegar weed (*Trichostema lanceolatum*), and turkey-mullien (*Croton setiger*). Riversidean sage scrub follows the Riversidean sage scrub subassociation of the Sage Scrub vegetation association of the MSHCP habitat accounts. Non-native grassland follows the non-native grassland subassociation of the Grasslands vegetation association of the MSHCP habitat accounts (Dudek 2003). Riparian scrub occurs in one small patch in the eastern portion of the survey area north of Theda Street. It is dominated by red willow (*Salix laevigata*) with a few mule fat (*Baccharis salicifolia*) individuals. The understory in this area is non-native grasses such



Survey Area

Vegetation Types and Other Landcovers

- Riversidean sage scrub/non-native grassland
- Ruderal
- Bare ground
- Exotic ornamental
- Developed/exotic ornamental
- Developed

250 125 0 250 Feet

Aerial Source: ESRI, DigitalGlobe 2018

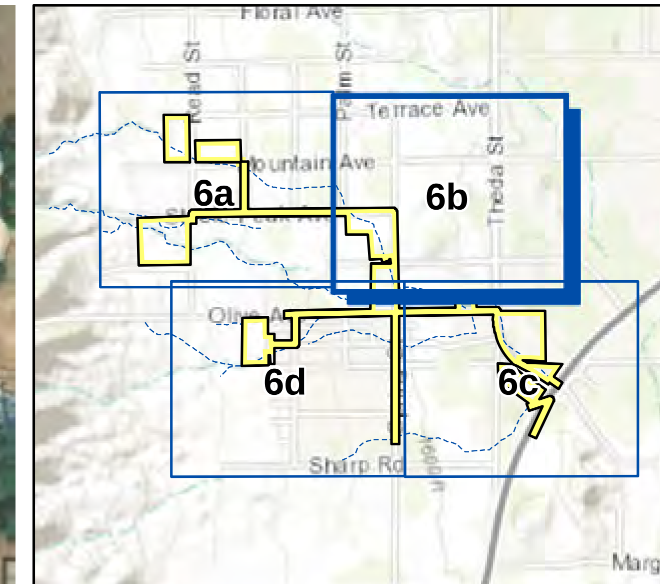
Biological Resources Exhibit 6a

Good Hope – Olive Avenue Storm Drain Project

PSOMAS

(Rev: 12/12/2019 MMD) D:\Projects\2RIV\010103\MXD\Habitat_Assessment\ex_BiologicalResources.pdf

D:\Projects\2RIV\010103\MXD\Habitat_Assessment\ex_BiologicalResources_20190930.mxd



Survey Area

Vegetation Types and Other Landcovers

Ruderal

Bare ground

Exotic ornamental

Developed/exotic ornamental

Developed

N
W E
S

250 125 0 250
Feet

Aerial Source: ESRI, DigitalGlobe 2018

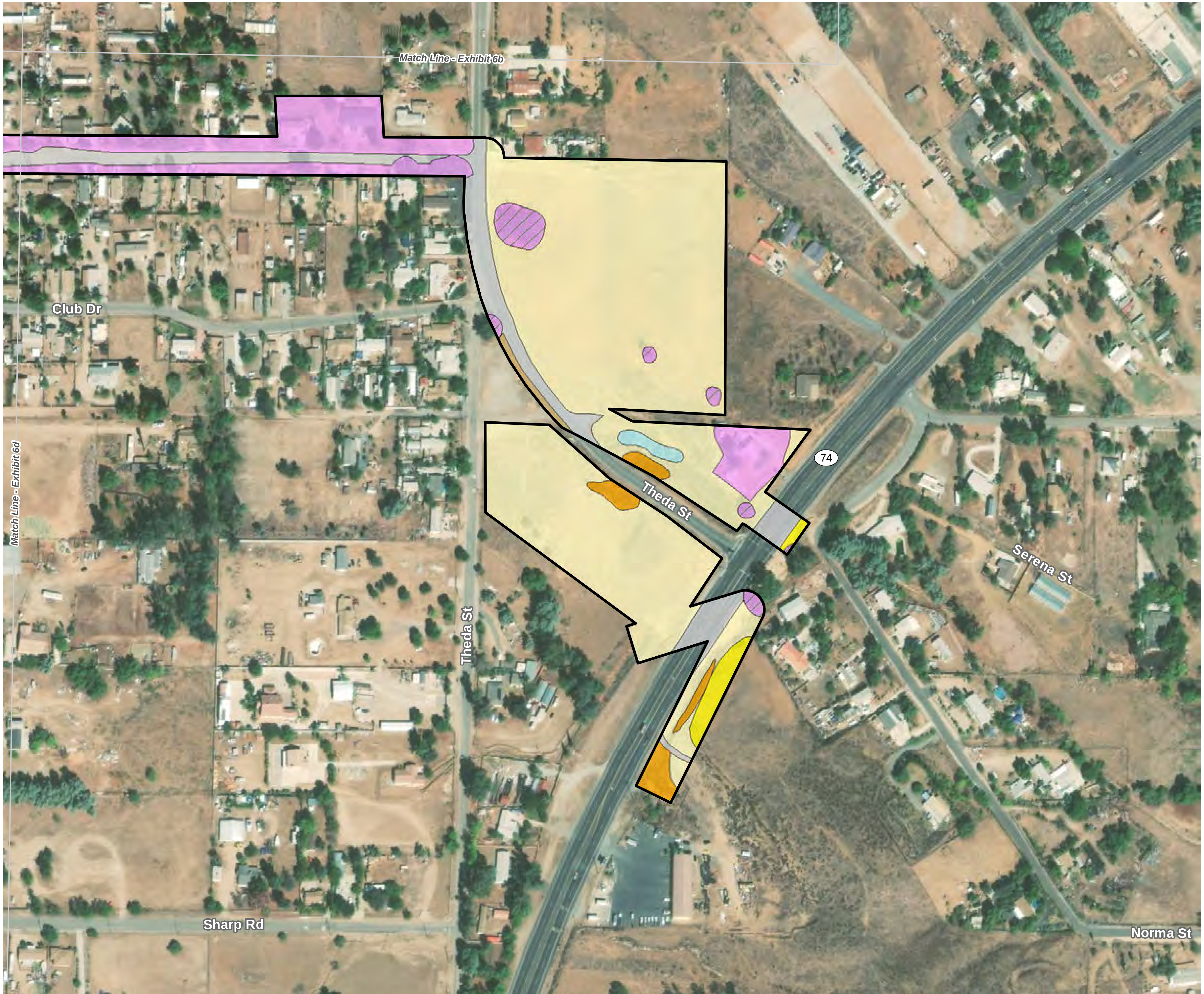
Biological Resources Exhibit 6b

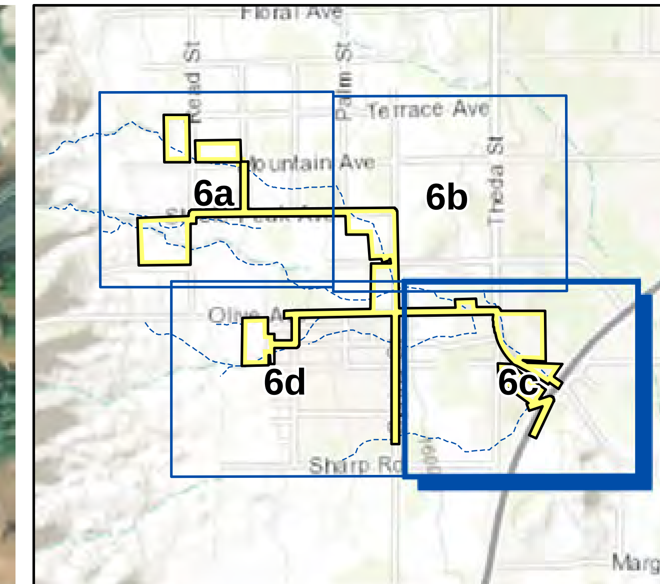
Good Hope – Olive Avenue Storm Drain Project

PSOMAS

(Rev: 12/12/2019 MMD) D:\Projects\2RIV\010103\MXD\Habitat_Assessment\ex_BiologicalResources.pdf

D:\Projects\2RIV\010103\MXD\Habitat_Assessment\ex_BiologicalResources_20190930.mxd





Survey Area

Vegetation Types and Other Landcovers

- Riversidean sage scrub/non-native grassland
- Riparian scrub
- Non-native grassland
- Ruderal
- Bare ground
- Exotic ornamental
- Developed/exotic ornamental
- Developed

N
W E
S

250 125 0 250 Feet

Aerial Source: ESRI, DigitalGlobe 2018

D:\Projects\2RIV\010103\MXD\Habitat_Assessment\ex_BiologicalResources_20190930.mxd

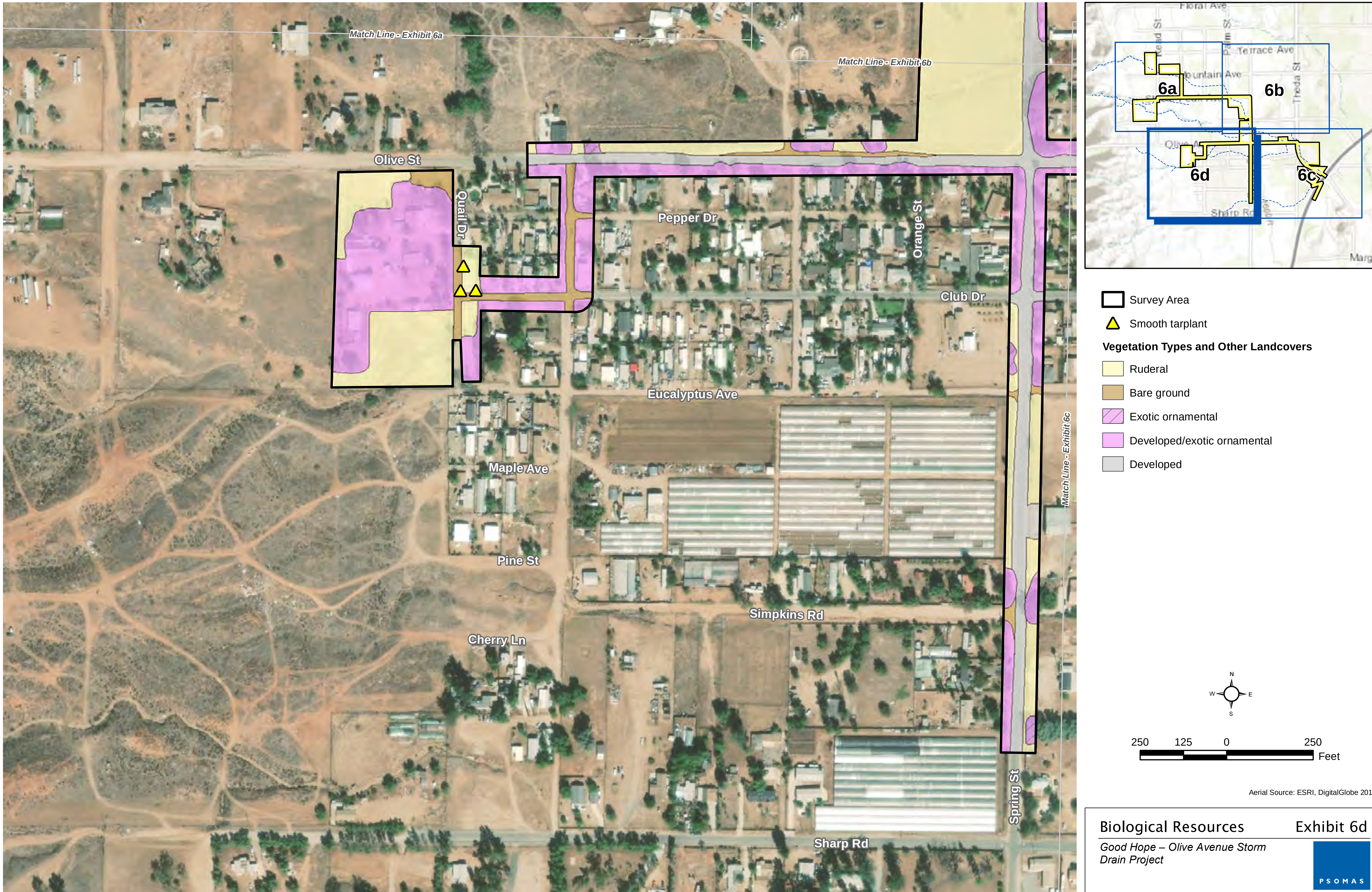
Biological Resources

Exhibit 6c

Good Hope – Olive Avenue Storm Drain Project

PSOMAS

(Rev: 12/12/2019 MMD) D:\Projects\2RIV\010103\MXD\Habitat_Assessment\ex_BiologicalResources.pdf



Survey Area

Smooth tarplant

Vegetation Types and Other Landcovers

Ruderal

Bare ground

Exotic ornamental

Developed/exotic ornamental

Developed

N W E S

250 125 0 250 Feet

Aerial Source: ESRI, DigitalGlobe 2018

Biological Resources Exhibit 6d

Good Hope – Olive Avenue Storm Drain Project

PSOMAS

(Rev: 12/12/2019 MMD) D:\Projects\2RIV\010103\MXD\Habitat_Assessment\ex_BiologicalResources.pdf

D:\Projects\2RIV\010103\MXD\Habitat_Assessment\ex_BiologicalResources_20190930.mxd

as red brome and wild oat. Riparian scrub follows the riparian scrub subassociation of the Riparian Forest/Woodland/Scrub vegetation association of the MSHCP habitat accounts (Dudek 2003).

Non-native grassland occurs east of Highway 74 and is dominated by red brome and wild oat. Non-native grassland follows the non-native grassland subassociation of the Grasslands vegetation association of the MSHCP habitat accounts (Dudek 2003).

Ruderal (weedy) vegetation occurs throughout much of the survey area. In portions of the ruderal areas, evidence of recent ground-disturbance (e.g., mowing, tilling) was noted during the survey. The dominant species in this vegetation type are grayish shortpod mustard (*Hirschfeldia incana*), annual bur-sage (*Ambrosia acanthicarpa*), Russian thistle (*Salsola tragus*), prickly lettuce (*Lactuca serriola*), telegraph weed (*Heterotheca grandiflora*), castor bean (*Ricinus communis*), vinegar weed, turkey-mullien, and fascicled tarplant (*Deinandra fasciculata*). Paniculate tarplant (*Deinandra paniculate*), a California Rare Plant Rank (CRPR) 4.2 species, also occurs in ruderal areas. Paniculate tarplant was observed scattered throughout the parcel south of Mapes Road and on the parcel southwest of Steele Peak Drive and Read Street but was not mapped because it's CRPR status does not warrant mapping. Ruderal vegetation follows the non-native grassland subassociation of the Grasslands vegetation association of the MSHCP habitat accounts (Dudek 2003).

Exotic ornamental vegetation is scattered throughout the survey area, consisting primarily of eucalyptus (*Eucalyptus* sp.) and pine (*Pinus* sp.) trees. Developed/exotic ornamental areas occur mostly along the roadways and consist of exotic ornamental areas closely associated with roadways and residential areas. These areas correspond to the Residential/Urban/Exotic vegetation association of the MSHCP habitat accounts (Dudek 2003).

Bare ground areas are unvegetated and typically include dirt access roads. Developed areas are also unvegetated and include paved access roads and developed areas. These areas correspond to the Residential/Urban/Exotic vegetation association of the MSHCP habitat accounts (Dudek 2003).

Wildlife

Most of the survey area provides low quality habitat for wildlife species due to the limited amount of native vegetation types, the disturbed nature of much of the survey area, and surrounding development. California buckwheat scrub/non-native grassland, Riversidean sage scrub/non-native grassland, and riparian scrub provide higher quality habitat than the ruderal, exotic ornamental, and unvegetated vegetation types; however, these areas occur in disjunct patches and contain a high proportion of non-native grasses. In general, wildlife species present in the survey area are expected to be relatively urban-tolerant and acclimated to human activity. The parcel southwest of Steele Drive/Read Street consists of Riversidean sage scrub/non-native grassland and is contiguous with off-site sage scrub habitat; therefore, it could have species that are typical of native habitats (i.e., those more sensitive to urban settings).

Drainages in the survey area are ephemeral and are expected to only hold water following storms; therefore, fish species are not expected to occur.

There is only one small patch of riparian scrub (0.13 acre) and it is relatively isolated. The drainages are generally vegetated with non-native grasses rather than riparian or woodland vegetation types; therefore, amphibian species are not expected to occur. The western side-blotched lizard (*Uta stansburiana elegans*) was observed in the survey area. Other common reptile species that may occur include the western fence lizard (*Sceloporus occidentalis*), granite spiny lizard (*Sceloporus orcutti*), southern Pacific rattlesnake (*Crotalus oreganus helleri*), California kingsnake (*Lampropeltis californiae*), and gopher snake (*Pituophis catenifer*).

Bird species observed during the survey include Eurasian collared-dove (*Streptopelia decaocto*), mourning dove (*Zenaida macroura*), Anna's hummingbird (*Calypte anna*), killdeer (*Charadrius vociferus*), turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), black phoebe (*Sayornis nigricans*), Say's phoebe (*Sayornis saya*), Cassin's kingbird (*Tyrannus vociferans*), California scrub-jay (*Aphelocoma californica*), common raven (Corvus corax), bushtit (*Psaltriparus minimus*), northern mockingbird (*Mimus polyglottos*), house finch (*Haemorhous mexicanus*), and lesser goldfinch (*Spinus psaltria*). Other common bird species that may occur include rock pigeon (*Columba livia*), Costa's hummingbird (*Calypte costae*), Cooper's hawk (Accipiter cooperii), American kestrel (*Falco sparverius*), rock wren (*Salpinctes obsoletus*), Bewick's wren (*Thryomanes bewickii*), spotted towhee (*Pipilo maculatus*), rufous-crowned sparrow (*Aimophila ruficeps*), California towhee (*Melozone crissalis*), savannah sparrow (*Passerculus sandwichensis*), white-crowned sparrow (*Zonotrichia leucophrys*), hooded oriole (*Icterus cucullatus*), Bullock's oriole (*Icterus bullockii*), and yellow-rumped warbler (*Setophaga coronata*).

California ground squirrel (*Otospermophilus beecheyi*), black-tailed jackrabbit (*Lepus californicus*), and desert cottontail (*Sylvilagus audubonii*) were observed during the survey. Other common mammal species that may occur in the survey area include Botta's pocket gopher (*Thomomys bottae*), Virginia opossum (*Didelphis virginiana*), common raccoon (*Procyon lotor*), and striped skunk (*Mephitis mephitis*). Bat species that forage and roost in urban areas, such as the big brown bat (*Eptesicus fuscus*), may occur in the survey area.

Wildlife Movement

The fragmentation of open space areas by urbanization creates isolated "islands" of wildlife habitat. Wildlife movement corridors link together areas of suitable wildlife habitat that are otherwise separated by rugged terrain, changes in vegetation, or human disturbance. In the absence of habitat linkages that allow movement to adjoining open space areas, various studies have concluded that some wildlife species, especially the larger and more mobile mammals, will not likely persist over time in fragmented or isolated habitat areas because they prohibit the infusion of new individuals and genetic information. Corridors mitigate the effects of this fragmentation by (1) allowing animals to move between remaining habitats, thereby permitting depleted populations to be replenished and promoting genetic exchange; (2) providing escape routes from fire, predators, and human disturbances, thus reducing the risk that catastrophic events, such as fire or disease, will result in population or local species extinction; and (3) serving as travel routes for individual animals as they move in their home ranges in search of food, water, mates, and other necessary resources.

The MSHCP has identified the Gavilan Hills to the west of the survey area as a regional movement corridor (i.e., Proposed Linkage 3). The survey area is located approximately 585 feet east of Proposed Linkage 3. The survey area consists of open space scattered within rural residential to moderate-density residential neighborhoods. Furthermore, only one parcel contains native habitat contiguous with off-site habitat (Riversidean sage scrub/non-native grassland on the parcel southwest of Steele Drive/Read Street); the remainder of the open space lacks native vegetation or includes only disjunct patches of native vegetation. Therefore, the survey area does not provide a wildlife corridor and is expected to be used for movement by urban-tolerant species such as coyotes (*Canis latrans*).

SPECIAL STATUS RESOURCES

Special status resources are species and vegetation types that have been afforded recognition by federal and State resource agencies and by private conservation organizations (e.g., the CNPS). In general, the principal reason an individual taxon (e.g., species, subspecies, or variety) or vegetation type is given such recognition is a documented or perceived decline or limitation of its population size, geographic range, and/or distribution that results, in most cases, from habitat loss.

The Riverside County Board of Supervisors approved the MSHCP in 2003 and received permitting approval from the USFWS in June 2004. This plan establishes Criteria Areas (i.e., reserves) to adequately conserve many species listed as Threatened and Endangered by the USFWS and the CDFW. Impacts on Covered Species would be considered fully mitigated with the District's participation in the MSHCP program. Focused surveys are not required for most Covered Species and no additional permitting would be necessary. However, the MSHCP has identified some species or habitats with Additional Survey Needs that may require surveys and additional consultation (discussed below).

Riparian/Riverine Resources and Associated Species

As defined by Section 6.1.2 of the MSHCP, Riparian/Riverine areas are lands that contain habitat dominated by trees, shrubs, persistent emergents, or emergent mosses and lichens, which occur close to or depend upon soil moisture from a nearby fresh water source or areas with fresh water flow during all or a portion of the year (Dudek 2003). Riparian areas are those with riparian habitat (e.g., mule fat, willows) whereas riverine areas are areas that convey water that supports downstream riparian habitat. Areas may be considered Riverine if they support downstream resources, even if they are unvegetated or underground for a portion of their length.

Nine drainage features occur in the survey area (Exhibit 7). A portion of Drainage 7 contains riparian vegetation (i.e., riparian scrub consisting of a small patch of red willow and mule fat). Due to the presence of riparian vegetation, this area would be considered a Riparian area per Section 6.1.2 of the MSHCP.

The remaining drainage features lack riparian vegetation but are characterized by channelization with a defined bed and bank. It should be noted that channelization is discontinuous, being broken up by residential development. These discontinuities result in sheet flow through the community during storm events. Channelized flow through the rural properties eventually enters a double 7-foot-wide by 4-foot-high reinforced concrete box culvert under Highway 74. Flow from this culvert continues southeasterly in a natural wash that eventually joins with a tributary of the San Jacinto River, which is Public/Quasi-Public Conserved Land under the MSHCP. MSHCP Criteria Cells 3755, 3851, and 3955 encompass the San Jacinto River and conservation of these cells focus on habitat associated with the San Jacinto River. The drainage features in the survey area have the capacity to carry floodwaters (including sediments, nutrients, and toxics) downstream to the San Jacinto River. Therefore, these areas would be expected to be considered Riverine by the Riverside Conservation Authority under the MSHCP. However, given the lack of continuous channelized flow, the Riverside Conservation Authority should be consulted to provide concurrence with this determination.

Because the purpose of the proposed Project is to conduct drainage improvements, a Determination of Biologically Equivalent or Superior Preservation (DBESP) Report would likely be required pursuant to the MSHCP. The DBESP would detail impacts on Riparian/Riverine areas and describe compensatory mitigation to mitigate for Project impacts.. It should be noted that the reduction of flooding of residences may benefit downstream areas by decreasing the amount of

The Jurisdictional Delineation provided in this report has been superseded.

Please see the *Jurisdictional Delineation Report for the Good Hope-Olive Avenue Storm Drain Stages 1 and 2 Project* prepared by Chambers Group, Inc. in July 2024.

toxics (e.g., leaks from vehicles on roads/driveways) washed into downstream conservation areas.

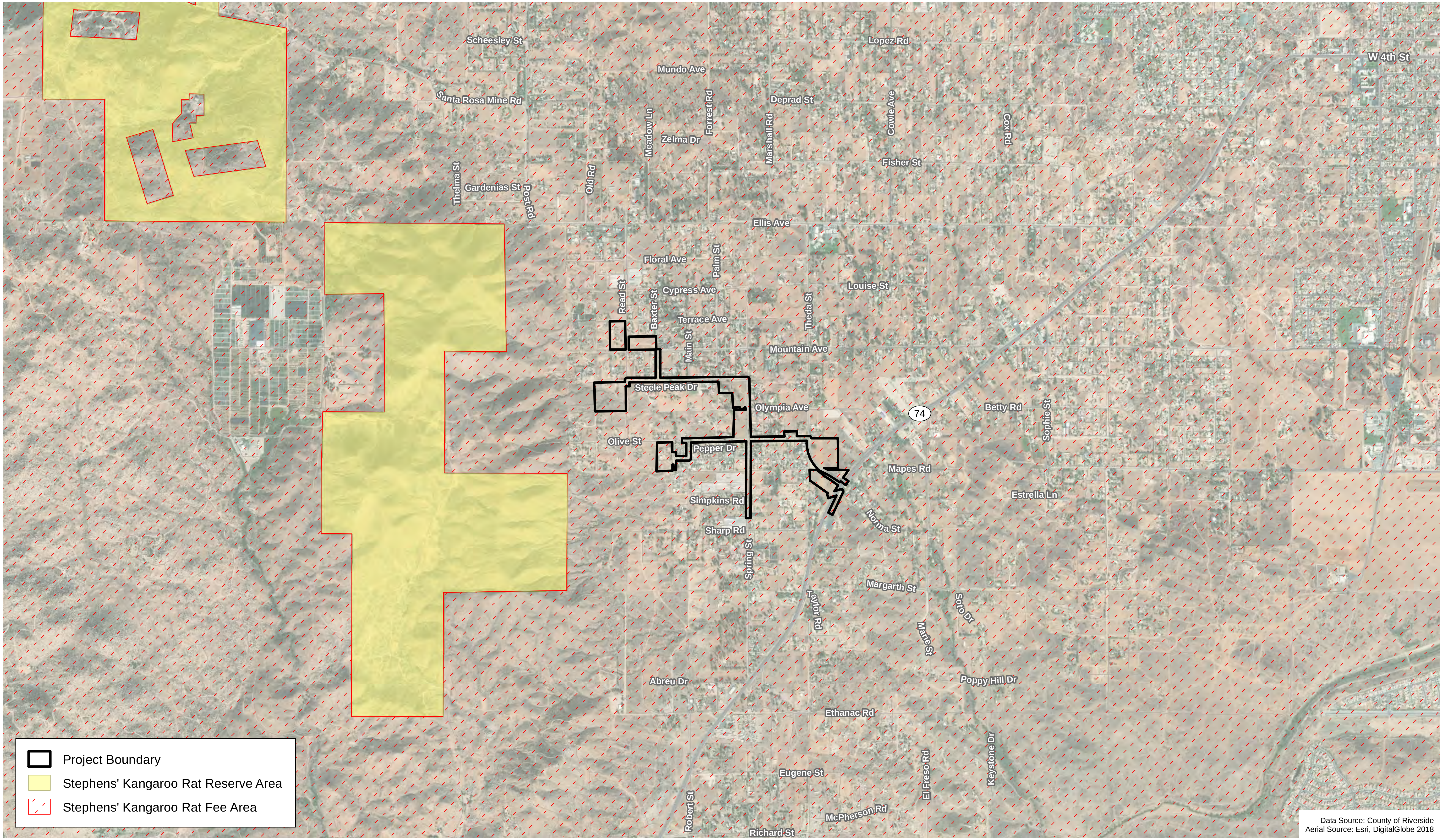
A small patch of riparian scrub is present along Drainage 7; however, due to its small size (0.13 acre) and disjunct nature, it does not provide habitat for Riparian/Riverine species (i.e., least Bell's vireo [*Vireo bellii pusillus*], southwestern willow flycatcher [*Empidonax traillii extimus*], or western yellow-billed cuckoo [*Coccyzus americanus occidentalis*]). The riparian scrub habitat consists of a few willow trees spaced apart in a narrow strip with a few short stature mule fat shrubs and does not contain cover or understory needed to support these riparian-dependent species. Therefore, no focused surveys for Riparian/Riverine species would be warranted.

Construction-related minimization measures provided in Section 7.5.3 of the MSHCP (Appendix A) would minimize indirect impacts to downstream water quality by requiring Best Management Practices (BMPs).

"Waters of the United States"/"Waters of the State"/CDFW Waters

Section 404 of the Federal Clean Water Act (CWA) and Section 1602 of the *California Fish and Game Code* regulate activities affecting resources under the jurisdiction of the USACE and the CDFW, respectively. "Waters of the United States", under the jurisdiction of the USACE include navigable coastal and inland waters, lakes, rivers, streams, and their tributaries; interstate waters and their tributaries; wetlands adjacent to such waters; intermittent streams; and other waters that could affect interstate commerce. The CDFW has jurisdictional authority over resources associated with rivers, streams, and lakes. Section 401 of the CWA provides the RWQCB with the authority to regulate, through a Water Quality Certification, any proposed federally permitted activity that may affect water quality. The RWQCB also has jurisdiction over isolated wetlands and waters under the Porter-Cologne Water Quality Control Act. As noted under methods, the jurisdictional authority of the USACE and RWQCB recently changed.

Nine drainage features occur in the survey area (Exhibit 7; Table 2). These drainages carry flow from the Gavilan Hills in the west flowing east through the rural residential properties in the Good Hope Community. Drainages mapped as jurisdictional waters during the field delineation exhibit well-defined channelization with evidence of bed, bank, and OHWM. However, the channelization is discontinuous, being broken up by residential development. These discontinuities result in sheet flow through the community during storm events. Other portions of the survey area appear to exhibit sheet flow along low points in the landscape and did not exhibit well-defined channelization or evidence of bed, bank, or OHWM. These areas of sheet flow were not delineated as jurisdictional waters. Channelized flow and sheet flow through the rural properties eventually enters a double 7-foot-wide by 4-foot-high reinforced concrete box culvert under Highway 74. Flow from this culvert continues southeasterly in a natural wash that eventually joins with a tributary of the San Jacinto River. The San Jacinto River ultimately flows into Lake Elsinore.



D:\Projects\2RIV010103\MXD\Habitat_Assessment\ex_SKR_Reserves_20190930.mxd

Stephens' Kangaroo Rat HCP

Good Hope – Olive Avenue Storm Drain Project

Exhibit 8

N W E S

2,000 1,000 0 2,000 Feet

PSOMAS

(Rev: 10/01/2019 MMD) R:\Projects\2RIV\2RIV010103\Graphics\Habitat_Assessment\ex_SKR_Reserves.pdf

TABLE 2
JURISDICTIONAL WATER RESOURCES IN THE SURVEY AREA

Jurisdiction	USACE Waters of the United States (acres)*	RWQCB Waters of the State (acres)	CDFW Waters (acres)
Drainage 1	0.000	0.009	0.017
Drainage 2	0.000	0.208	0.736
Drainage 3	0.000	0.005	0.010
Drainage 4	0.000	0.064	0.076
Drainage 5	0.000	0.001	0.001
Drainage 6	0.000	0.020	0.023
Drainage 7	0.000	0.073	0.198
Drainage 8	0.000	0.025	0.124
Drainage 9	0.000	0.073	0.108
Total	**0.000**	**0.478**	**1.293**

USACE: U.S. Army Corps of Engineers; RWQCB: Regional Water Quality Control Board; CDFW: California Department of Fish and Wildlife

* Based on the repeal of the 2015 Rule.

One drainage feature (Drainage 7) contained hydrophytic vegetation (i.e., willows and mule fat) along the channel; however, indicators of wetland hydrology were not present. Therefore, no area met all three parameters to be considered a wetland.

All drainages were dry at the time of the survey. Three of the drainages (Drainage 1, 2, and 3) in the western portion of the survey area were mapped by the NWI as being intermittent streambeds in the Riverine System that have a seasonally flooded water regime (USFWS 2019). Given lack of inundation visible on historic aerial imagery (Google Earth), it is likely that all nine drainages are non-permanent waters that are inundated following storm events (i.e., ephemeral waters). No waters of the United States occur in the survey area. Arid West Ephemeral and Intermittent Streams OHWM Datasheets are included as Appendix C.

The RWQCB would have jurisdiction over the features identified as ephemeral waters as defined by indicators of OHWM, such as a change in the average sediment texture, a change in vegetation cover, and/or a break in bank slope. A total of 0.478 acre of waters of the State under the jurisdiction of the RWQCB occur in the survey area.

Eight drainage features in the survey area exhibited bed and bank without adjacent riparian vegetation while one drainage (Drainage 7) contained willow and mule fat. A total of 1.293 acre of waters under the regulatory authority of the CDFW occur in the survey area.

Vernal Pools and Associated Species

In Section 6.1.2 of the MSHCP, vernal pools are defined as “seasonal wetlands that occur in sunken areas that have wetland soils, vegetation, and hydrology during the wetter portion of the growing season, but lack hydrology and/or vegetation during the drier portion of the year” (Dudek 2003). No basins, ponds, or obvious depressional features were observed during the survey. In addition, the soil type mapped in the survey area is not considered hydric (USDA NRCS 2019b).

Therefore, no vernal pools are present in the survey area. For these reasons, fairy shrimp are not expected to occur in the survey area.[1]

Criteria Area, Narrow Endemic, and Other Special Status Plant Species

According to the Riverside County Regional Conservation Authority MSHCP Information Mapping Application, focused plant surveys are not required for Criteria Area or Narrow Endemic plant species.

Based on the literature review, three species not covered by the MSHCP have been reported in the vicinity of the survey area: chaparral sand-verbena (*Abronia villosa* var. *aurita*), South Coast saltscale (*Atriplex pacifica*), and Robinson's peppergrass (*Lepidium virginicum* var. *robinsonii*).

Chaparral sand-verbena, a species with a CRPR of 1B.1 is known to occur approximately 7 miles west of the survey area (CCH 2019). This species occurs in sandy soils in coastal-sage scrub and chaparral at elevations lower than 5,249 feet above mean sea level (msl) (Jepson Flora Project 2019). A limited amount of marginally suitable habitat for this species occurs in the Riversidean sage scrub/non-native grassland in the survey area. This species may be considered a constraint on development per Section 15380[2] of the California Environmental Quality Act (CEQA) Guidelines. Therefore, focused surveys for this species during its blooming period would be recommended in potentially suitable habitat to determine the presence or absence of this species.

South Coast saltscale, a species with a CRPR of 1B.2 is known to occur approximately 11 miles east of the survey area. This species occurs in alkali soils in alkali sink, coastal sage scrub, wetland-riparian, and dunes at elevations below 1,640 feet msl (CCH 2019; Jepson Flora Project 2019). The survey area does not contain potentially suitable soils for this species, and it is not expected to occur.

Robinson's peppergrass, a species with a CRPR of 4.3 is known to occur approximately 2.4 miles west of the survey area. This species occurs in chaparral and coastal sage scrub at elevations below 1,640 feet msl (CCH 2019; Jepson Flora Project 2019). A limited amount of marginally suitable habitat for this species occurs in the Riversidean sage scrub/non-native grassland and California buckwheat scrub/non-native grassland habitats in the survey area. Species with a CRPR 4 are not considered constraints on development because they are on a watch list and not currently considered rare, threatened, or endangered. Therefore, focused surveys for this species would not be required.

Smooth tarplant (*Centromadia pungens* ssp. *laevis*), a species with a CRPR of 1B.1, was observed in the survey area (Exhibit 6d). Seven individuals were observed in ruderal vegetation. Smooth tarplant is a Criteria Area species covered by the MSHCP. Because the survey area is located outside an "Additional Survey Needs Area" for smooth tarplant (Exhibit 5), any impact on this species would be considered mitigated with the District's participation in the MSHCP. A CNDDB form for this observation is included in Appendix D.

Special Status Wildlife Species

Burrowing owls are small owls that nest in burrows, typically in open habitats most often along banks and roadsides. They breed and forage in grasslands and prefer flat to low rolling hills in

---

1 It should be noted that the surveying Biologist (Ms. Rudalevige) holds a 10(a) permit to survey for fairy shrimp.

2 Section 15380 of the State CEQA Guidelines indicates that a lead agency can consider a non-listed species (e.g., CRPR List 1B and 2 plants) to be Endangered, Rare, or Threatened for the purposes of CEQA if the species can be shown to meet the criteria in the definition of "Rare" or "Endangered".

treeless terrain. The survey area contains suitable habitat with suitable burrows for burrowing owl and is located within an “Additional Survey Needs Area” for burrowing owl (Section 6.3.2, Exhibit 5). Because suitable burrows were observed during the habitat assessment, focused surveys for burrowing owl would be required to determine the presence or absence of this species. If the number of owls affected would meet the criteria in this section, a DBESP may be required. Regardless of the results of focused surveys, a pre-construction survey for burrowing owl would also be required to ensure their absence prior to construction.

All other special status wildlife species with potential to occur in the survey area that would typically require mitigation in CEQA documentation are covered by the District’s participation in the MSHCP.

The survey area is also located within the Stephens’ Kangaroo Rat Habitat Conservation Plan Area (SKR HCP). The Steele Peak Reserve is located just west of the survey area (Exhibit 8). The survey area is within the “Fee Area” of this plan; however, development of parcels for use by local, state, or federal entities for governmental purposes is not subject to the fee program.

OTHER ISSUES

<u>Urban/Wildlands Interface Issues</u>

Indirect impacts, often called “edge effects”, are those that affect the quality of nearby wildlife habitat resulting from disturbance by construction (such as noise, dust, and urban pollutants) and/or the long-term use of the proposed Project site. Development in proximity to an MSHCP Conservation Area may result in edge effects that adversely affect biological resources within the MSHCP Conservation Area. The text below each subheading states the objective of each of these measures as described in the MSHCP.

The proposed Project is not immediately adjacent to any MSHCP Criteria Cell but occurs approximately 585 feet east of Cells 3268 and 3366 (Exhibit 5). Lands within Cells 3268 and 3366 would provide for Proposed Linkage 3. Urban/Wildlands Interface issues are not expected because of the distance from the Criteria Cells and the nature of the proposed Project.

Drainage

Proposed developments near the MSHCP Conservation Area shall incorporate measures, including measures required through the National Pollutant Discharge Elimination System (NPDES) requirements, to ensure that the quantity and quality of runoff discharged to the MSHCP Conservation Area is not altered in an adverse way when compared with existing conditions. In particular, measures shall be put in place to avoid discharge of untreated surface runoff from developed and paved areas into the MSHCP Conservation Area. Stormwater systems shall be designed to prevent the release of toxins, chemicals, petroleum products, exotic plant materials or other elements that might degrade or harm biological resources or ecosystem processes within the MSHCP Conservation Area. This can be accomplished using a variety of methods including natural detention basins, grass swales or mechanical trapping devices. Regular maintenance shall occur to ensure effective operations of runoff control systems.

The proposed Project will be required to follow guidelines in Section 6.1.4 to ensure stormwater systems are designed appropriately as described above (Appendix B). During construction and periodic maintenance, the Construction Minimization Measures (Section 7.5.3) will be required to ensure that Project activities do not affect downstream water quality and Riparian/Riverine resources (Appendix A).

Toxics

Land uses proposed in proximity to the MSHCP Conservation Area that require use of chemicals or generate bioproducts such as manure that are potentially toxic or may adversely affect wildlife species, habitat, or water quality shall incorporate measures to ensure that application of such chemicals does not result in discharge to the MSHCP Conservation Area. Measures such as those employed to address drainage issues shall be implemented.

During construction and periodic maintenance of the proposed Project, construction equipment would be present that contains petroleum products, which could adversely affect water quality and Riparian/Riverine resources. During construction, the Construction Minimization Measures (Section 7.5.3) will be required to ensure that construction of the proposed Project does not affect downstream water quality and Riparian/Riverine resources (Appendix A). Operation of the proposed Project would not involve toxics.

Lighting

Night lighting shall be directed away from the MSHCP Conservation Area to protect species within the MSHCP Conservation Area from direct night lighting. Shielding shall be incorporated in Project designs to ensure ambient lighting in the MSHCP Conservation Area is not increased.

Development of the proposed Project would not include night lighting. If possible, construction should be limited to daytime hours to avoid effects on nocturnal Covered Species that may be affected by night lighting (e.g. Stephens' kangaroo rat). If construction must occur at night, night lighting should be directed at the work areas, minimizing the amount of spillover into adjacent open space areas.

Noise

Proposed noise generating land uses affecting the MSHCP Conservation Area shall incorporate setbacks, berms or walls to minimize the effects of noise on MSHCP Conservation Area resources pursuant to applicable rules, regulations and guidelines related to land use noise standards. For planning purposes, wildlife within the MSHCP Conservation Area should not be subject to noise that would exceed residential noise standards.

The proposed Project would not generate any additional noise. Some additional noise would be generated during construction and periodic maintenance of the proposed Project; however, the amount of noise is expected to be limited and it is not anticipated to affect Cells 3268 and 3366 due to their distance from the proposed Project site (i.e., 585 feet west of the survey area).

Invasives

When approving landscape plans for development that is proposed adjacent to the MSHCP Conservation Area, Permittees shall consider the invasive, non-native plant species (see MSHCP Table 6-2) and shall require revisions to landscape plans (subject to the limitations of their jurisdiction) to avoid the use of invasive species for the portions of development that are adjacent to the MSHCP Conservation Area. Considerations in reviewing the applicability of this list shall include proximity of planting areas to the MSHCP Conservation Areas, species considered in the planting plans, resources being protected within the MSHCP Conservation Area and their relative sensitivity to invasion, and barriers to plant and seed dispersal, such as walls, topography and other features.

No landscaping is proposed as part of the proposed Project. However, construction equipment can introduce non-native weed seeds to adjacent areas if equipment is not properly cleaned. It is recommended that any construction equipment be cleaned prior to arrival on the Project site to prevent the spread of weed seeds.

Barriers

Proposed land uses adjacent to the MSHCP Conservation Area shall incorporate barriers, where appropriate in individual Project designs to minimize unauthorized public access, domestic animal predation, illegal trespass or dumping in the MSHCP Conservation Area. Such barriers may include native landscaping, rocks/boulders, fencing, walls, signage and/or other appropriate mechanisms.

As the proposed Project is not immediately adjacent to Cells 3268 and 3366, no barriers would be necessary.

Grading/Land Development

Manufactured slopes associated with proposed site development shall not extend into the MSHCP Conservation Area.

As the proposed Project is not immediately adjacent to Cells 3268 and 3366, it would not be affected by grading or development of the proposed Project.

Construction Minimization Measures

Section 7.5.3 of the MSHCP contains a list of standard measures to minimize direct and indirect impacts on biological resources within and adjacent to the proposed Project. These measures are related to protecting water quality, controlling dust, minimizing the spread of invasive plant species, minimizing fire hazards, and other measures. These measures also include requirements to mark Project limits through staking/flagging as verified by monitoring personnel.

Nesting Birds/Raptors

The Migratory Bird Treaty Act (MBTA) protects the taking of migratory birds and their nests and eggs. Bird species protected under the provisions of the MBTA are identified by the List of Migratory Birds (Code of Federal Regulations, Title 50, §10.13). Section 3503 of the California Fish and Game Code makes it unlawful to take, possess, or destroy any bird's nest or any bird's eggs. Section 3513 of the California Fish and Game Code prohibits the take and possession of any migratory nongame bird, as designated in the MBTA. Birds have potential to nest throughout the survey area in vegetation, on bare ground, and on structures. If construction would be initiated during the peak bird nesting season (March 1 to June 30, as defined by Section 7.5.3 of the MSHCP), a pre-construction survey would be required to ensure that no nests are impacted. If an active nest is present, construction may be restricted in the immediate vicinity of the nest until nesting is complete.

Trees in the survey area and immediate vicinity have potential to be used for nesting by raptors such as the American kestrel. Regulations prohibit activities that "take, possess or destroy" any raptor nest or egg (California Fish and Game Code §3503, 3503.5, and 3513). Additionally, the noise and disturbance associated with construction may disturb a nesting raptor adjacent to the proposed Project. If construction would be initiated during the raptor nesting season (generally between February 1 and June 30), a pre-construction survey would be required to ensure that no raptor nests are impacted. If an active nest is present, construction may be temporarily restricted in the immediate vicinity of the nest until nesting is complete.

RECOMMENDATIONS

The following is a list of recommendations to ensure that the proposed Project is consistent with the MSHCP and other regulations protecting biological resources.

1. The proposed Project may impact potentially jurisdictional features and would require permits from the RWQCB (a Section 401 Water Quality Certification), and/or the CDFW (a Lake or Streambed Alteration Agreement). Note that the extent of jurisdiction under the USACE recently changed resulting in ephemeral waters no longer being subject to USACE jurisdiction. Following implementation of the new USACE rule, there is no Section 404 permit authority. Due to lack of federal jurisdiction, a Section 401 Water Quality Certification would not be required, rather Waste Discharge Requirements under California's Porter-Cologne Water Quality Control Act would be required from the RWQCB.

2. The proposed Project may impact drainage features that are considered Riparian or Riverine under the MSHCP (Section 6.1.2). As such, a DBESP is anticipated to be necessary to detail Project impacts and identify compensatory mitigation. As feasible, mitigation for Riparian/Riverine would be combined with the mitigation required for the Project's regulatory permitting of jurisdictional areas.

3. A focused survey for chaparral sand-verbena would be required to determine the presence or absence of this species in the Riversidean sage scrub/non-native grassland vegetation type if this vegetation type would be impacted by the project. The survey window for this species would begin in approximately March/April; the appropriate timing would be determined by monitoring a nearby reference population. Within the survey area, there is 6.53 acres of Riversidean sage scrub/non-native grassland that would need to be surveyed.

4. Because suitable burrows were observed during the habitat assessment, a focused survey for burrowing owl would be required to determine the presence or absence of this species throughout the survey area (Section 6.3.2). If certain criteria are met for this species, a DBESP may be required. The survey window for this species would begin in March/April and would continue through July/August. The entire survey area would need to be surveyed for burrowing owl.

5. Regardless of the results of focused surveys, a pre-construction survey for burrowing owl would be required within 30 days prior to construction (Section 6.3.2).

6. Requirements for drainage related to Urban/Wildlands Interface (Section 6.1.4, Appendix B) would be required to ensure the proposed Project is designed to prevent degradation of downstream Riparian/Riverine areas.

7. Construction Minimization Measures (Section 7.5.3, Appendix A) would be required to avoid and minimize effects during construction. In addition, the following measures are recommended.

    - If possible, construction should be limited to daytime hours. If construction must occur at night, night lighting should be directed at the work areas, minimizing the amount of spillover into adjacent open space areas.

    - Construction vehicles should be washed prior to delivery to the Project site to avoid the spread of weed seeds. Track-clean or other methods of vehicle cleaning should be used by the construction contractor to prevent weed seeds from entering/exiting the Project site on vehicles.

8. Vegetation removal should be planned to occur outside the peak nesting season for raptors (February 1 to June 30) and the peak nesting season for birds (March 1 to June 30). If vegetation removal would occur between February 1 and June 30, a pre-construction survey for active raptor/bird nests would be required. Restrictions may be placed on construction activities in the vicinity of any active nest until the nest is no longer active, as determined by a qualified Biologist.

REFERENCES

American Ornithological Society (AOS). 2018 (October). *Check-list of North and Middle American Birds* (7th ed., as revised through 58th Supplement). Washington, D.C.: AOU. http://checklist.aou.org/.

Baldwin, B.G., D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken (Eds.). 2012. *The Jepson Manual: Vascular Plants of California* (Second ed.). Berkeley, CA: University of California Press.

California Department of Fish and Wildlife (CDFW). 2019a. California Natural Diversity Database. Records of Occurrence for the USGS Steele Peak, Perris, Romoland, and Elsinore 7.5-minute quadrangles. Sacramento, CA: CDFW, Natural Heritage Division.

———. 2019b (August). *Special Animals.* Sacramento, CA: CDFW, Natural Heritage Division.

———. 2019c (August). *Special Vascular Plants, Bryophytes, and Lichens List.* Sacramento, CA: CDFW, Natural Heritage Division.

California Invasive Plant Council (Cal-IPC). 2018 (April 12, date accessed). The Cal-IPC Inventory Explanation of Cal-IPC Ratings. Berkeley, CA: Cal-IPC. http://www.cal-ipc.org/plants/inventory/.

California Native Plant Society (CNPS). 2017. Inventory of Rare and Endangered Plants (online edition, v8-03). Records of Occurrence for USGS Alberhill and Elsinore 7.5-minute quadrangles. Sacramento, CA: CNPS. http://www.rareplants.cnps.org/.

Collins, J.T. and T.W. Taggart. 2009. *Standard Common and Current Scientific Names for North American Amphibians, Turtles, Reptiles and Crocodilians* (6th ed.). Lawrence, KS: Center for North American Herpetology.

Consortium of California Herbaria (CCH). 2019 (database extract updated September 26, 2019). Consortium of California Herbaria. Data provided by the participants of the Consortium of California Herbaria for Robinson's pepper grass, chaparral sand-verbena, and south coast saltscale. Berkeley, CA: University of California. http://ucjeps.berkeley.edu/consortium/.

Dudek and Associates, Inc. (Dudek). 2003. Western Riverside County Multiple Species Habitat Conservation Plan (Prepared for the Riverside County Integrated Project). Encinitas, CA: Dudek. http://www.wrc-rca.org/about-rca/multiple-species-habitat-conservation-plan/.

Hickman, J.C., Ed. 1993. *The Jepson Manual of Higher Plants of California*. Berkeley, CA: University of California Press.

Jepson Flora Project. 2019 (September 21, 2018, Revision 6). Jepson eFlora (Records for common species discussed in this report). Berkeley, CA: The Jepson Herbarium. http://ucjeps.berkeley.edu/eflora/.

Knopf, F.L, and M.B. Wunder. 2006. Mountain Plover (*Charadrius montanus*). *The Birds of North America, No. 211* (A. Poole, Ed.). Philadelphia, PA: The Academy of Natural Sciences.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016 (April 28). The National Wetland Plant List: 2016 Wetland Ratings. *Phytoneuron* 2016-30:1–17. Fort Worth, TX: G.L. Nesom.

Munz, P.A. 1974. *A Flora of Southern California*. Berkeley, CA: University of California Press.

Rahman Engineering Services (Rahman). 2017 (July 15). Project Specific Water Quality Management Plan. Chino, CA: Rahman.

Sawyer, J., T. Keeler-Wolf, and J. Evens. 2009. *A Manual of California Vegetation, 2nd Edition*. Sacramento, CA: California Native Plant Society Press.

Smithsonian National Museum of Natural History (SNMNH). 2011. Mammal Species of the World (3rd ed.) (a database based on Wilson, D.E., and D. M. Reeder's 2005 publication entitled *Mammal Species of the World, A Taxonomic and Geographic Reference*, 3rd ed.). Washington, D.C.: SNMNH. https://www.departments.bucknell.edu/biology/resources/msw3/.

U.S. Army Corps of Engineers (USACE) 2008 (September). *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0). (J.S. Wakeley, R.W. Lichvar, and C.V. Noble, Eds.). Vicksburg, MS: U.S. Army Engineer Research and Development Center. http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA489704&Location=U2&doc=GetTRDoc.pdf.

U.S. Department of Agriculture, Natural Resources Conservation Service (USDA NRCS). 2019a (September 1, access date). Web Soil Survey. https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx.

———. 2019b (September 30, access date). State Soil Data Access Hydric Soils List. Washington, D.C.: USDA, NRCS. http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/.

U.S. Fish and Wildlife Service (USFWS). 2019. Wetland Mapper. Washington D.C.: USFWS, National Wetlands Inventory. http://www.fws.gov/wetlands/Data/Mapper.html.

This page intentionally left blank

APPENDIX A

CONSTRUCTION MINIMIZATION MEASURES

- Plans for water pollution and erosion control will be prepared for all Discretionary Projects involving the movement of earth in excess of 50 cubic yards. The plans will describe sediment and hazardous materials control, dewatering or diversion structures, fueling and equipment management practices, use of plant material for erosion control. Plans will be reviewed and approved by the County of Riverside and participating jurisdiction prior to construction.
- Timing of construction activities will consider seasonal requirements for breeding birds and migratory non-resident species. Habitat clearing will be avoided during species active breeding season defined as March 1 to June 30.
- Sediment and erosion control measures will be implemented until such time soils are determined to be successfully stabilized.
- Short-term stream diversions will be accomplished by use of sand bags or other methods that will result in minimal in-stream impacts. Short-term diversions will consider effects on wildlife.
- Silt fencing or other sediment trapping materials will be installed at the downstream end of construction activities to minimize the transport of sediments off-site.
- Settling ponds where sediment is collected will be cleaned in a manner that prevents sediment from re-entering the stream or damaging/disturbing adjacent areas. Sediment from settling ponds will be removed to a location where sediment cannot re-enter the stream or surrounding drainage area. Care will be exercised during removal of silt fencing to minimize release of debris or sediment into streams.
- No erodible materials will be deposited into water courses. Brush, loose soils, or other debris material will not be stockpiled within stream channels or on adjacent banks.
- The footprint of disturbance will be minimized to the maximum extent feasible. Access to sites will occur on pre-existing access routes to the greatest extent possible.
- Equipment storage, fueling and staging areas will be sited on non-sensitive upland habitat types with minimal risk of direct discharge into riparian areas or other sensitive habitat types.
- The limits of disturbance, including the upstream, downstream and lateral extents, will be clearly defined and marked in the field. Monitoring personnel will review the limits of disturbance prior to initiation of construction activities.
- During construction, the placement of equipment within the stream or on adjacent banks or adjacent upland habitats occupied by Covered Species that are outside of the project footprint will be avoided.
- Exotic species removed during construction will be properly handled to prevent sprouting or regrowth.
- Training of construction personnel will be provided.
- Ongoing monitoring and reporting will occur for the duration of the construction activity to ensure implementation of best management practices.
- When work is conducted during the fire season (as identified by the Riverside County Fire Department) adjacent to coastal sage scrub or chaparral vegetation, appropriate fire-fighting equipment (e.g., extinguishers, shovels, water tankers) shall be available on the site during all phases of project construction to help minimize the chance of human-caused wildfires. Shields, protective mats, and/or other fire preventative methods shall be used during grinding, welding, and other spark-inducing activities. Personnel trained in fire

hazards, preventative actions, and responses to fires shall advise contractors regarding fire risk from all construction-related activities.

- Active construction areas shall be watered regularly to control dust and minimize impacts to adjacent vegetation.
- All equipment maintenance, staging, and dispensing of fuel, oil, coolant, or any other toxic substances shall occur only in designated areas within the proposed grading limits of the project site. These designated areas shall be clearly marked and located in such a manner as to contain run-off.
- Waste, dirt, rubble, or trash shall not be deposited in the Conservation Area or on native habitat.

APPENDIX B

URABN/WILDLANDS INTERFACE ISSUES

6.1.4 Guidelines Pertaining to the Urban/Wildlands Interface

The guidelines presented in this section are intended to address indirect effects associated with locating Development in proximity to the MSHCP Conservation Area, where applicable. Existing local regulations are generally in place that address the issues presented in this section. Specifically, the County of Riverside and the 14 Cities within the MSHCP Plan Area have approved general plans, zoning ordinances and policies that include mechanisms to regulate the development of land. In addition, project review and impact mitigation that are currently provided through the CEQA process address these issues.

Sections 3.2 and 3.3 of this document provide a general description of the MSHCP Conservation Area and contain the Criteria for Reserve Assembly. As the MSHCP Conservation Area is assembled, "hard-line" boundaries shall be established and Development may occur adjacent to the MSHCP Conservation Area. Future Development in proximity to the MSHCP Conservation Area may result in Edge Effects that will adversely affect biological resources within the MSHCP Conservation Area. To minimize such Edge Effects, the following guidelines shall be implemented in conjunction with review of individual public and private Development projects in proximity to the MSHCP Conservation Area. Edge effects associated with existing and future land uses in proximity to the MSHCP Conservation Area shall also be addressed through overall MSHCP management activities described in *Section 5.0* of this document, particularly General Management Measures 1 and 8 as described in Section 5.2.1.

- **Drainage**

Proposed Developments in proximity to the MSHCP Conservation Area shall incorporate measures, including measures required through the National Pollutant Discharge Elimination System (NPDES) requirements, to ensure that the quantity and quality of runoff discharged to the MSHCP Conservation Area is not altered in an adverse way when compared with existing conditions. In particular, measures shall be put in place to avoid discharge of untreated surface runoff from developed and paved areas into the MSHCP Conservation Area. Stormwater systems shall be designed to prevent the release of toxins, chemicals, petroleum products, exotic plant materials or other elements that might degrade or harm biological resources or ecosystem processes within the MSHCP Conservation Area. This can be accomplished using a variety of methods including natural detention basins, grass swales or mechanical trapping devices. Regular maintenance shall occur to ensure effective operations of runoff control systems.

- **Toxics**

Land uses proposed in proximity to the MSHCP Conservation Area that use chemicals or generate bioproducts such as manure that are potentially toxic or may adversely affect wildlife species, Habitat or water quality shall incorporate measures to ensure that application of such chemicals does not result in discharge to the MSHCP Conservation Area. Measures such as those employed to address drainage issues shall be implemented.

- **Lighting**

Night lighting shall be directed away from the MSHCP Conservation Area to protect species within the MSHCP Conservation Area from direct night lighting. Shielding shall be incorporated in project designs to ensure ambient lighting in the MSHCP Conservation Area is not increased.

- **Noise**

Proposed noise generating land uses affecting the MSHCP Conservation Area shall incorporate setbacks, berms or walls to minimize the effects of noise on MSHCP Conservation Area resources pursuant to applicable rules, regulations and guidelines related to land use noise standards. For planning purposes, wildlife within the MSHCP Conservation Area should not be subject to noise that would exceed residential noise standards.

- Invasives

When approving landscape plans for Development that is proposed adjacent to the MSHCP Conservation Area, Permittees shall consider the invasive, non-native plant species listed in *Table 6-2* and shall require revisions to landscape plans (subject to the limitations of their jurisdiction) to avoid the use of invasive species for the portions of Development that are adjacent to the MSHCP Conservation Area. Considerations in reviewing the applicability of this list shall include proximity of planting areas to the MSHCP Conservation Areas, species considered in the planting plans, resources being protected within the MSHCP Conservation Area and their relative sensitivity to invasion, and barriers to plant and seed dispersal, such as walls, topography and other features.

TABLE 6-2
PLANTS THAT SHOULD BE AVOIDED
ADJACENT TO THE MSHCP CONSERVATION AREA

BOTANICAL NAME	COMMON NAME
Acacia spp. (all species)	acacia
Achillea millefolium	var. *millefolium* common yarrow
Ailanthus altissima	tree of heaven
Aptenia cordifolia	red apple
Arctotheca calendula	cape weed
Arctotis spp. (all species & hybrids)	African daisy
Arundo donax	giant reed or arundo grass
Asphodelus fistulosus	asphodel
Atriplex glauca	white saltbush
Atriplex semibaccata	Australian saltbush
Carex spp. (all species*)	sedge
Carpobrotus chilensis	ice plant
Carpobrotus edulis	sea fig
Centranthus ruber	red valerian
Chrysanthemum coronarium	annual chrysanthemum
Cistus ladanifer	(incl. hybrids/varieties) gum rockrose
Cortaderia jubata [*syn.C. Atacamensis*]	jubata grass, pampas grass
Cortaderia dioica [syn. *C. sellowana*]	pampas grass

TABLE 6-2
PLANTS THAT SHOULD BE AVOIDED
ADJACENT TO THE MSHCP CONSERVATION AREA

BOTANICAL NAME	COMMON NAME
Cotoneaster spp. (all species)	cotoneaster
Cynodon dactylon	(incl. hybrids varieties) Bermuda grass
Cyperus spp. (all species*)	nutsedge, umbrella plant
Cytisus spp. (all species)	broom
Delosperma 'Alba'	white trailing ice plant
Dimorphotheca spp. (all species)	African daisy, Cape marigold
Drosanthemum floribundum	rosea ice plant
Drosanthemum hispidum	purple ice plant
Eichhornia crassipes	water hyacinth
Elaegnus angustifolia	Russian olive
Eucalyptus spp. (all species)	eucalyptus or gum tree
Eupatorium coelestinum [syn. Ageratina sp.]	mist flower
Festuca arundinacea	tall fescue
Festuca rubra	creeping red fescue
Foeniculum vulgare	sweet fennel
Fraxinus uhdei	(and cultivars) evergreen ash, shamel ash
Gaura (spp.) (all species)	gaura
Gazania spp. (all species & hybrids)	gazania
Genista spp. (all species)	broom
Hedera canariensis	Algerian ivy
Hedera helix	English ivy
Hypericum spp. (all species)	St. John's Wort
Ipomoea acuminata	Mexican morning glory
Lampranthus spectabilis	trailing ice plant
Lantana camara	common garden lantana
Lantana montevidensis [syn. *L. sellowiana*]	lantana
Limonium perezii	sea lavender
Linaria bipartita	toadflax
Lolium multiflorum	Italian ryegrass
Lolium perenne	perennial ryegrass
Lonicera japonica	(incl. 'Halliana') Japanese honeysuckle
Lotus corniculatus	birdsfoot trefoil
Lupinus arboreus	yellow bush lupine
Lupinus texanus	Texas blue bonnets
Malephora crocea	ice plant
Malephora luteola	ice plant

TABLE 6-2
PLANTS THAT SHOULD BE AVOIDED
ADJACENT TO THE MSHCP CONSERVATION AREA

BOTANICAL NAME	COMMON NAME
Mesembryanthemum nodiflorum	little ice plant
Myoporum laetum	myoporum
Myoporum pacificum	shiny myoproum
Myoporum parvifolium	(incl. ‘Prostratum') ground cover myoporum
Oenothera berlandieri	Mexican evening primrose
Olea europea	European olive tree
Opuntia ficus-indica	Indian fig
Osteospermum spp. (all species)	trailing African daisy, African daisy,
Oxalis pes-caprae	Bermuda buttercup
Parkinsonia aculeata	Mexican palo verde
Pennisetum clandestinum	Kikuyu grass
Pennisetum setaceum	fountain grass
Phoenix canariensis	Canary Island date palm
Phoenix dactylifera	date palm
Plumbago auriculata	cape plumbago
Polygonum spp. (all species)	knotweed
Populus nigra ‘italica	' Lombardy poplar
Prosopis spp. (all species*)	mesquite
Ricinus communis	castorbean
Robinia pseudoacacia	black locust
Rubus procerus	Himalayan blackberry
Sapium sebiferum	Chinese tallow tree
Saponaria officinalis	bouncing bet, soapwart
Schinus molle	Peruvian pepper tree, California pepper
Schinus terebinthifolius	Brazilian pepper tree
Spartium junceum	Spanish broom
Tamarix spp. (all species)	tamarisk, salt cedar
Trifolium tragiferum	strawberry clover
Tropaelolum majus	garden nasturtium
Ulex europaeus	prickly broom
Vinca major	periwinkle
Yucca gloriosa	Spanish dagger

An asterisk (*) indicates some native species of the genera exist that may be appropriate.

Sources: California Exotic Pest Plant Council, United States Department of Agriculture-Division of Plant Health and Pest Prevention Services, California Native Plant Society, Fremontia Vol. 26 No. 4, October 1998, The Jepson Manual; Higher Plants of California, and County of San Diego-Department of Agriculture.

➢ Barriers

Proposed land uses adjacent to the MSHCP Conservation Area shall incorporate barriers, where appropriate in individual project designs to minimize unauthorized public access, domestic animal predation, illegal trespass or dumping in the MSHCP Conservation Area. Such barriers may include native landscaping, rocks/boulders, fencing, walls, signage and/or other appropriate mechanisms.

➢ Grading/Land Development

Manufactured slopes associated with proposed site development shall not extend into the MSHCP Conservation Area.

This page intentionally left blank

APPENDIX C

OHWM DATASHEETS

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Good Hope - Olive Ave Storm Drain
Project Number: 2RIV 010103
Stream: unnamed
Investigator(s): A Rudalevige

Date: 9/9/19 **Time:** 12:15
Town: unincorporated **State:** CA
Photo begin file#: **Photo end file#:**

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details: Good Hope Community of Riverside County

Projection: d.m.s. **Datum:** NAD83
Coordinates: 33°45'43.01", -117°17'26.94"

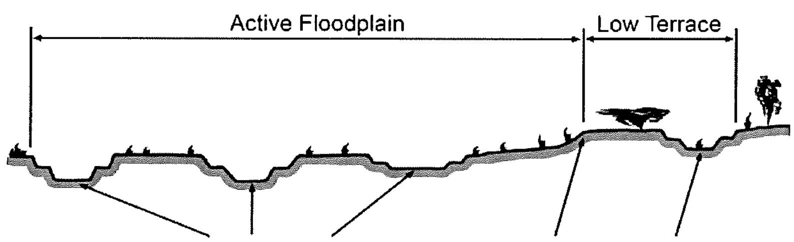
Potential anthropogenic influences on the channel system:
Surrounding development and periodic ground disturbance of drainages and surrounding areas (e.g. mowing or tilling). Flow interrupted downstream due to development.

Brief site description:
Undeveloped lots in rural residential setting.

Checklist of resources (if available):

- ☒ Aerial photography
  Dates: 2018 & historic
- ☒ Topographic maps
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☐ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

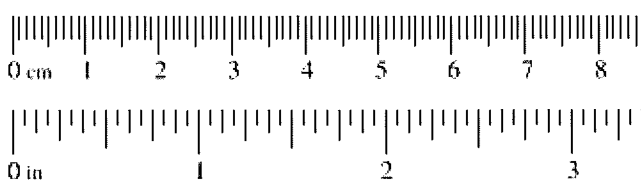


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☒ Mapping on aerial photograph
   - ☐ GPS
   - ☐ Digitized on computer
   - ☐ Other:

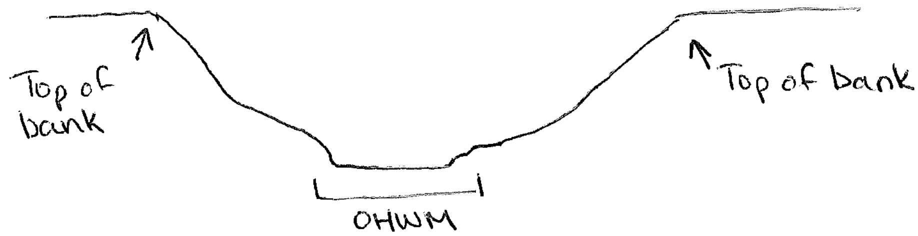
Wentworth Size Classes

Inches (in)		Millimeters (mm)	Wentworth size class	
			Boulder	Gravel
	10.08	256		
			Cobble	
	2.56	64		
			Pebble	
	0.157	4		
			Granule	
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	
	0.020	0.50		
			Medium sand	
1/2	0.0098	0.25		
			Fine sand	
1/4	0.005	0.125		
			Very fine sand	
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	
1/32	0.00061	0.0156		
			Fine silt	
1/64	0.00031	0.0078		
			Very fine silt	
1/128	0.00015	0.0039		
			Clay	Mud



Project ID: 2RIV010103 **Cross section ID:** 1 **Date:** 9/9/19 **Time:** 12:15

Cross section drawing:



OHWM

GPS point: 33°45'43.01", -117°17'26.94"

Indicators:

- [x] Change in average sediment texture
- [ ] Change in vegetation species
- [x] Change in vegetation cover
- [x] Break in bank slope
- [ ] Other: ____________
- [ ] Other: ____________

Comments:

Floodplain unit:

- [x] Low-Flow Channel
- [ ] Active Floodplain
- [ ] Low Terrace

GPS point: 33°45'43.01", -117°17'26.94"

Characteristics of the floodplain unit:

Average sediment texture: Coarse Sand

Total veg cover: 3 % Tree: 0 % Shrub: <1 % Herb: 2 %

Community successional stage:

- [ ] NA
- [x] Early (herbaceous & seedlings)
- [ ] Mid (herbaceous, shrubs, saplings)
- [ ] Late (herbaceous, shrubs, mature trees)

Indicators:

- [ ] Mudcracks
- [ ] Ripples
- [ ] Drift and/or debris
- [x] Presence of bed and bank
- [ ] Benches
- [ ] Soil development
- [ ] Surface relief
- [ ] Other: ____________
- [ ] Other: ____________
- [ ] Other: ____________

Comments:

low flow channel largely unvegetated.

Project ID: **Cross section ID:** 1 **Date:** 9/9/19 **Time:** 12:15

Floodplain unit: ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: –

Characteristics of the floodplain unit:

Average sediment texture: ____________

Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ %

Community successional stage:

- ☐ NA
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Early (herbaceous & seedlings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Soil development
- ☐ Ripples
- ☐ Surface relief
- ☐ Drift and/or debris
- ☐ Other: ____________
- ☐ Presence of bed and bank
- ☐ Other: ____________
- ☐ Benches
- ☐ Other: ____________

Comments:

Most of the drainage does not have an active floodplain.

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☒ Low Terrace

GPS point: –

Characteristics of the floodplain unit:

Average sediment texture: ____________

Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ %

Community successional stage:

- ☐ NA
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Early (herbaceous & seedlings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Soil development
- ☐ Ripples
- ☐ Surface relief
- ☐ Drift and/or debris
- ☐ Other: ____________
- ☐ Presence of bed and bank
- ☐ Other: ____________
- ☐ Benches
- ☐ Other: ____________

Comments:

No low terrace is present. The banks extend from the edge of the channel to a height of over five feet and are dominated by upland coastal sage scrub vegetation and non-native, weedy species.

APPENDIX D

CNDDB FORM

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 09/09/2019

For Office Use Only

Source Code ______ Quad Code ______
Elm Code ______ Occ. No. ______
EO Index No. ______ Map Index No. ______

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Centromadia pungens ssp. laevis*

Common Name: smooth tarplant

Species Found? ☑ Yes ☐ No ______ If not, why?

Total No. Individuals 7 Subsequent Visit? ☐ yes ☐ no

Is this an existing NDDB occurrence? ______ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: ______ Number Rancho Santa Ana Botanic Garden Museum / Herbarium

Reporter: Allison Rudalevige

Address: 3 Hutton Centre Drive, Suite 200
Santa Ana, CA 92707

E-mail Address: allison.rudalevige@psomas.com

Phone: (714) 751-7373

Plant Information

Phenology: ___% vegetative 100% flowering ___% fruiting

Animal Information

___ # adults ___ # juveniles ___ # larvae ___ # egg masses ___ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

County: Riverside Landowner / Mgr.: private

Quad Name: Steele Peak Elevation: 1,700

T S05S R 04W Sec 03, 02 ¼ of ___ ¼, Meridian: H☐ M☐ S☑ Source of Coordinates (GPS, topo. map & type): GoogleEarth

T ___ R ___ Sec 11, ___ ¼ of ___ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model ______

DATUM: **NAD27** ☐ **NAD83** ☑ **WGS84** ☐ Horizontal Accuracy 20 feet meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑

Coordinates: 33.757885, -117.285033

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

At edge of undeveloped lot in ruderal vegetation with soils mapped as terrace escarpments. Associated with Salsola tragus, Oncosiphon piluliferum, and Bromus diandrus.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☑ Fair ☐ Poor

Immediate AND surrounding land use: Open space and residential

Visible disturbances: Ground disturbance, non-native vegetation

Threats: human activity

Comments:

Determination: *(check one or more, and fill in blanks)*

☑ Keyed (cite reference): Baldwin et al. 2012
☐ Compared with specimen housed at: ______
☐ Compared with photo / drawing in: ______
☐ By another person (name): ______
☐ Other: ______

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☑
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☑ no ☐

APPENDIX C

JURISDICTIONAL DELINEATION REPORT FOR THE GOOD HOPE-OLIVE AVENUE STORM DRAIN STAGES 1 AND 2 PROJECT RIVERSIDE, CALIFORNIA

Prepared for:

RIVERSIDE COUNTY
Flood Control and Water Conservation District
1995 Market Street
Riverside, California 92501

Prepared by:

CHAMBERS GROUP, INC.
3151 Airway Avenue, Suite F208
Costa Mesa, CA 92626

August 2024

TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

SECTION 1.0 – INTRODUCTION

Chambers Group, Inc. (Chambers Group) was retained by the Riverside County Flood Control District (District) to conduct a Jurisdictional Delineation (JD) for the proposed Good Hope-Olive Avenue Storm Drain Stages 1 and 2 Project (Project).

The purpose of this JD report is to delineate the potential waters and wetlands that occur within and/or immediately adjacent to the Project site. This JD report describes the type and extent of: (1) waters of the United States, including wetlands (if present), under the regulatory authority of the U.S. Army Corps of Engineers (USACE); (2) waters of the State under the regulatory authority of the Regional Water Quality Control Board (RWQCB); (3) waters under the regulatory authority of the California Department of Fish and Wildlife (CDFW); and (4) Riparian/Riverine areas pursuant to the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Section 6.1.2.

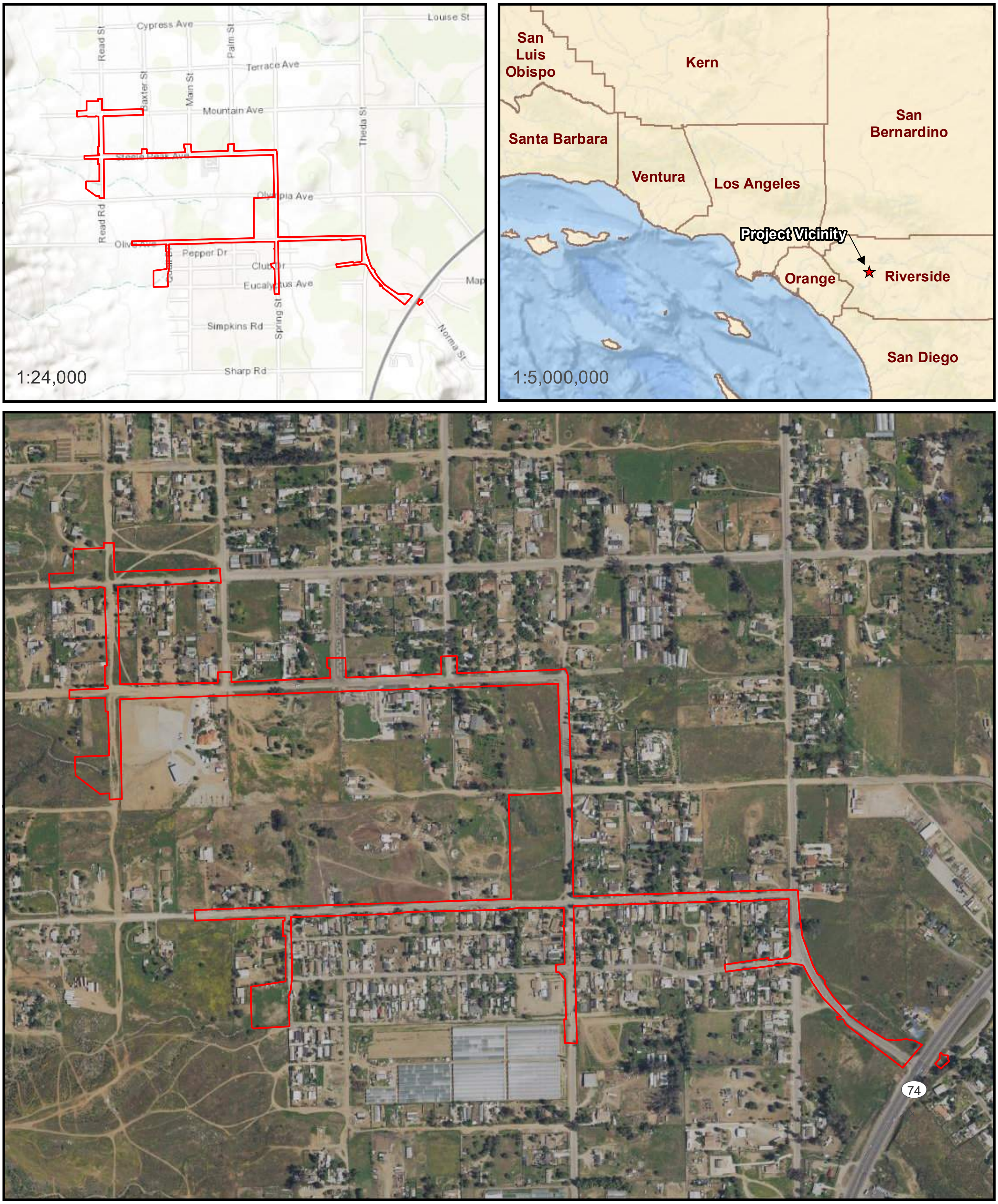
1.1. PROJECT BACKGROUND

The Project is located in the unincorporated community of Good Hope in Riverside County. The Good Hope area currently has very little flood control infrastructure. Flooding in residential areas occurs during periods of heavy rain. Notable flooding during storms in 2015 and 2017 led to community members petitioning the District for flood control improvements. In response to the community's needs, the District proposes to improve drainage in the area.

The proposed Project consists of the construction, operation, and maintenance of approximately 12,500 feet (ft) of storm drains ranging in diameter from 18"–84", a detention basin, three (3) inlet structures, multiple catch basins, an outlet structure, energy dissipators, and potential slope stabilization measures in the Riverside County community of Good Hope. Storm drains are proposed in the rights-of-way (ROWs) of existing roads, providing 100-year flood protection to the properties between Quail Drive and Spring Street, and properties east of Spring Street and west of Theda Street between Olive Avenue and Eucalyptus Avenue. The District has also partnered with Riverside County Transportation Department (RCTD) to provide street improvements at the same time as the installation of the underground facilities. Collectively, these improvements will safely convey stormwater flows to the existing box culvert located near the intersection of State Route (SR-) 74 and Theda Street, thereby eliminating significant surface drainage from meandering through existing residential properties during large storm events.

The Project will construct three (3) inlet structures at the northwest corner of Read Street and Mountain Avenue, the northwest corner of Olympia Avenue and Read Street, and northwest of Eucalyptus Avenue and Quail Road to collect storm flows within the community and convey them to a detention basin at the northwest corner of Spring Street and Olive Avenue, which will then drain to the existing culvert and cross SR-74. The Project will repair and replace the existing outlet structure and riprap located southeast side of SR-74.

The Project area is generally bounded by Mountain Avenue to the north, Eucalyptus Avenue to the south, Read Street to the west, Theda Street to the east, and State Route SR-74 to the southeast. The Project area includes Assessor Parcel Numbers (APNs) 343-20-1002, 343-10-0006, 343-18-0009, 343-23-0001, 345-08-0070, 345-08-0071, 345-08-0072, 345-08-0068, and 345-08-0067. The Project is located the U.S. Geological Survey (USGS) Steele Peak, California 7.5-minute topographic quadrangle. The Project site is located just west of SR-74 and is surrounded by rural residential homes and open fields. The elevation at the Project site ranges from 1,560 to 1,605 feet above mean sea level (amsl). Maps of the Project Location and Project Vicinity are provided in Figure 1.



Project Location

Figure 1
Good Hope-Olive Ave Storm Drain
Project Location and Vicinity

N

0 300 600 1,200
Feet

Name: 21382 BIO Fig 1 Project Location and Vicinity.Mxd
Print Date: 5/12/2023, Author: pcarlos

CHAMBERS GROUP

SECTION 2.0 – REGULATORY OVERVIEW

The limits of jurisdictional waters regulated by the USACE, RWQCB and CDFW were delineated for the proposed Project site. Pursuant to Section 404 of the Clean Water Act, USACE regulates the discharge of dredged and/or fill material into waters of the United States. The State of California (State) regulates discharge of material into waters of the State pursuant to Section 401 of the Clean Water Act and the California Porter-Cologne Water Quality Control Act (California Water Code, Division 7, §13000 et seq.). Pursuant to Division 2, Chapter 6, Sections 1600-1602 of the California Fish and Game Code, CDFW regulates all diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake which supports fish or wildlife.

On September 12, 2019, the Environmental Protection Agency (EPA) and Department of the Army signed a final rule to repeal the 2015 Clean Water Rule (2015 Rule) and re-codify the regulatory text defining "waters of the United States" that existed prior to the 2015 Rule. The new regulations went into effect on December 23, 2019. One of the proposed changes includes ephemeral features that contain water only during or in response to rainfall would no longer be considered “waters of the United States” under the jurisdiction of the USACE. On August 28, 2019, the Office of Administrative Law approved the State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to “waters of the State”. The procedures went into effect on May 28, 2020. Under these new regulations, the State Water Resources Control Board and its nine RWQCBs will assert jurisdiction over all existing “waters of the United States”, and all waters that would have been considered “waters of the United States” under the 2015 Rule. Thus, the “waters of the United States” that would no longer be under USACE jurisdiction would be under RWQCB jurisdiction.

The EPA and USACE are in receipt of the U.S. District Court for the District of Arizona’s August 30, 2021, order vacating and remanding the Navigable Waters Protection Rule in the case of *Pascua Yaqui Tribe v. U.S. Environmental Protection Agency*. On October 22, 2019, the EPA and USACE published a final rule to repeal the 2015 Clean Water Rule: Definition of “Waters of the United States” (“2015 Rule”), which amended portions of the Code of Federal Regulations (CFR), and to restore the regulatory text that existed prior to the 2015 Rule. The final “Revised Definition of ‘Waters of the United States’” rule (the “2023 Rule”) became effective on March 20, 2023. Therefore, this JD is consistent with the 2023 Rule and includes measurement of the Ordinary High Water Mark (OHWM) to determine Waters of the United States (WoUS).

Evaluation of the state jurisdiction follows guidance from the same jurisdictional areas as USACE. In addition, the JD study area was reviewed for resources potentially regulated under the Porter-Cologne Act (i.e., isolated features).

CDFW regulates impacts or alterations to streambeds, including any obstruction or diversion to the natural flow of a stream, substantial change or use of material from a stream, or a deposit or disposal of any debris into a stream as part of Fish and Game Code Sections 1600-02. CDFW jurisdiction includes water features with a defined bed and bank. Features were delineated by measuring the outer width and length boundaries, consisting of either the top of bank (TOB) measurement or the extent of associated riparian or wetland vegetation (whichever is greater).

The Western Riverside County MSHCP requires that project sites be evaluated for a number of factors to assess how they meet MSHCP criteria. The jurisdictional delineation for the Project includes assessments for Riparian/Riverine areas (and associated species) and vernal pools (and associated species) pursuant to MSHCP Section 6.1.2; urban/wildlands interface issues pursuant to MSHCP Section 6.1.4; and areas under the jurisdictions of the USACE and/or the CDFW as discussed in MSHCP Section 6.1.2. MSHCP Riparian/Riverine areas are defined as:

"*those lands which contain habitat dominated by trees, shrubs, persistent emergent, 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).

Additional discussion of the regulatory framework is provided in Appendix A.

SECTION 3.0 – METHODS

3.1. LITERATURE REVIEW

As part of the delineation effort, high-resolution aerial photographs, USGS topographic maps, and Google Earth (Google 2022) imagery were examined to determine the potential areas that may contain waters subject to USACE, RWQCB, and CDFW jurisdiction on the Project site. USFWS National Wetlands Inventory (NWI) maps, National Hydrological Database (NHD) maps, topographic maps, and aerial photographs were used to identify drainage patterns and potential connectivity (nexus) through the Project site. Aerial photos (Google 2022) and topographic maps (USGS 1973) were used to identify potential hydrologic connectivity (significant nexus) to traditional navigable waters (TNW); features indicating connectivity were investigated in the field. In addition, Chambers Group reviewed the Habitat Assessment with a Jurisdictional Delineation for the Good Hope-Olive Avenue Storm Drain Project Report (Psomas 2019).

United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA 2022) was reviewed for soil types found within the Project sites.

3.2. FIELD SURVEY

During the field survey, boundaries and dimensions of jurisdictional features were recorded on aerial photographs, Global Positioning System (GPS) units, and standardized datasheets. Features within the proposed Project were investigated for the presence of federally jurisdictional wetlands, federally jurisdictional non-wetland waters of the United States, CDFW jurisdictional streambeds including ephemeral and intermittent streambeds, RWQCB jurisdictional waters, and other water bodies, riparian habitats, potential wetlands, and connectivity, and MSHCP Riparian/Riverine Areas. The delineation defined the USACE and RWQCB jurisdictional boundaries based on the OHWM. The presence or absence of wetlands within or adjacent to the OHWM were verified through the determination of the presence of (1) hydrologic conditions and (2) hydrophytic vegetation pursuant to the 1987 Wetland Manual and Arid West Supplement guidelines (USACE 1987, 2007, 2008a, 2008b) and A Field Guide to the Identification of the OHWM in the Arid West Region of the Western U.S., A Delineation Manual; a soil test pit documenting the presence of hydrophytic vegetation would only be dug if the other wetland indicators were present or if problematic situations were present. The limits of CDFW jurisdiction were mapped from the top of bank to the top of bank along the channel/drainage, or to the outer limits of riparian vegetation (outer dripline), whichever was greater.

Where accessible, connectivity was determined by following the drainages from their origins to their terminal points. In areas with limited access or occurring on private property, connectivity was determined using USGS topographic maps, NWI and NHD maps, and aerial images. Water features (e.g., drainages, water bodies) within the Project limits were investigated for the presence of OHWM, bank to bank (BTB) measurements, and connectivity. The existing width of the water feature (e.g., OHWM or BTB) crossed by the proposed Project was measured (linear feet) in the field perpendicular to the drainage path.

Data from the delineation was digitized and recorded using Geographic Information System (GIS) software and displayed on aerial maps for this report (Figure 2). Reference photographs were taken during this survey and are included as Appendix D.

3.2.1 Hydrology

Typical hydrologic indicators were noted, if observed per the *1987 Wetland Manual and Arid West Supplement Guidelines* (USACE 1987, 2007, 2008b). Indicators include evidence of inundation, saturation, surface water, watermarks, drift lines, sediment deposits, destruction of vegetation, water-stained leaves, and the presence or oxidation/reduction features in the soil, among several others.

Consideration of the climate and flow frequency was given when observing watermarks and drift lines. For the purpose of determining a significant nexus to a TNW, aerial photographs, NWI and NHD maps, and USGS quadrangles were referenced. All features were inspected in the field on and off site for true connectivity.

3.2.2 Vegetation

If wetland plants were identified, they were categorized according to their probability to occur in wetlands versus non-wetlands in accordance with the categories in the National List of Species that Occur in Wetlands (Reed 2016). More specifically, the California Land Resource Region (Region 0) wetlands plant list was used, which is a regional adaptation of the National List. The wetland species categories are:

I. Obligate Wetland (OBL) – Occur almost always (estimated probability >99 percent) under natural conditions in wetlands.

II. Facultative Wetland (FACW) – Usually occur in wetlands (estimated probability 67 percent to 99 percent), but occasionally found in non-wetlands.

III. Facultative (FAC) – Equally likely to occur in wetlands or non-wetlands (estimated probability 34 percent to 66 percent).

IV. Facultative Upland (FACU) – Usually occur in non-wetlands (estimated probability 67 percent to 99 percent), but occasionally found in wetlands.

V. Obligate Upland (UPL) – May occur in wetlands in another region but occur almost always (estimated probability >99 percent) under natural conditions in non-wetlands in southern California. All species not listed on the *National List of Species that Occur in Wetlands* (Reed 2016) are considered to be UPL.

VI. No Indicator (NI) – NI is recorded for those species for which insufficient information was available to determine an indicator status.

Plant species and absolute cover values were recorded by stratum (i.e., tree, sapling/shrub, herb, woody vine) and evaluated for dominance and prevalence according to guidelines in the *1987 Wetland Manual and 2008 Arid West Supplement* (USACE 1987, 2008b). Plant species naming conventions follow the *Jepson Manual, Second Edition* (Baldwin et al. 2012). Vegetation communities follow the naming convention in *A Manual of California Vegetation* (Sawyer et al. 2009).

3.2.3 Soils

Soil pits were dug in representative delineated features on the Project site, and soils were evaluated according to guidelines in the *1987 Wetland Manual and 2008 Arid West Supplement* (USACE 1987, 2008b). Soil layers were examined for the presence or absence of hydric soil indicators and oxidation/reduction features indicative of historic saturated soil conditions. In addition, soil pits were dug in representative delineated features on the Project site in areas that had the most potential to exhibit hydric characteristics.

SECTION 4.0 – RESULTS

The following sections provide context and background by describing soils, vegetation, and hydrological features within the Project site. The results of the field delineation are presented below. Site photographs are included in Appendix C.

4.1. HYDROLOGY AND HYDROLOGIC CONNECTIVITY

The Project is located within the Railroad Canyon Reservoir-San Jacinto River watershed within the area of undetermined flood hazard within the Federal Emergency Management Agency (FEMA) 100-year flood zone (Hydrologic Unit Code [HUC10] 180702020307) (USDA 2022) (Figure 2a). The San Jacinto River watershed in Good Hope is bordered to the south by Lake Elsinore and the Temescal Mountains, to the west by Lake Mathews, Temescal Valley and the Santa Ana Mountains, to the north by the Box Spring Mountains, and to the east by Perris Valley and the City of Perris. The Lower and Middle San Jacinto Rivers are the major water sources for the watershed which drains into the San Jacinto River and Lake Elsinore. The headwaters of the San Jacinto River are in the San Bernardino Mountains. Although the Project site is located within the San Jacinto River watershed, surface waters do not connect directly to the San Jacinto River or any of its tributaries (Figure 2b).

Rainfall in the general Project vicinity was well above normal for the month of November during the survey. According to the University of California Agricultural and Natural Resources (UCANR) weather data, the annual precipitation average for the general area for November 2020-2021 was approximately 0.045 inches (UCANR 2023). The rainfall total for November 2022 was approximately 0.76 inches. In addition, a rain event occurred the day prior to the field survey on November 3; therefore, both surface connectivity and the lack of connectivity was clearly evident during the time of the survey.

4.2. FIELD SURVEY

A field survey was conducted on November 3 and 30, 2022, by Chambers Group biologists Heather Franklin, Austin Burke, and Paul Morrissey between the hours of 0800 and 1430. The temperatures ranged from 54 to 66 degrees Fahrenheit (°F), with cloud cover ranging from 25 to 95 percent, and no precipitation; however, rain occurred the day prior to the survey.

A total of three drainages and one non-jurisdictional swale were identified within the Project site. A riparian area was identified adjacent to and outside of the Project site.

4.3. VEGETATION COMMUNITIES

Seven vegetation communities were mapped within the Project site, including Riversidean Sage Scrub/Non- Native Grasslands, Black Willow-Red Willow Thickets, Disturbed Black Willow-Red Willow Thickets, Disturbed California Buckwheat Scrub, non- native Disturbed/Ruderal, Exotic/Ornamental and Disturbed/Dirt Roads. Vegetation mapped during the delineation is provided in Figure 3.

4.3.1 Riversidean Sage Scrub/Non-Native Grasslands

Riversidean Sage Scrub/Non-Native Grassland has a moderately high proportion of non-native grasses such as red brome (*Bromus madritensis* ssp. *rubens*) and wild oat (*Avena* spp.). Other species occurring include cholla (*Cylindropuntia* sp.), vinegar weed (*Trichostema lanceolatum*), and turkey-mullien (*Croton* *setiger*). This community occurs along the banks and within Drainage 1 and is dominated by a mix of California buckwheat (*Eriogonum fasciculatum*), California sagebrush (*Artemisia californica*), and California brittlebush (*Encelia californica*). This community occurs within and surrounding Drainage 1.

4.3.2 Black Willow-Red Willow Thickets

Black Willow-Red Willow Thickets are dominated by multiple willow species in the tree canopy including black willow (*Salix gooddingii*) and red willow (*S. laevigata*). Trees are less than 60 feet in height, the canopy is open to continuous, the shrub layer is sparse to continuous, and herbaceous layer is variable throughout much of California (Sawyer et al. 2009). This community typically occupies terraces along rivers or canyons, and the floodplains of streams, or within seeps, springs, ditches, lake edges, or low-gradient depositions along intermittent streams. The community is seasonally flooded and saturated with fresh water (Sawyer et al. 2009).

Black Willow-Red Willow Thickets are present southwest of Drainage 3, outside of the Project area. Plant species found in this riparian area are typical of this vegetation community and are dominated by red willow and scattered black willow trees, with a sparse understory shrub canopy of scattered mule fat (*Baccharis salicifolia* subsp. *salicifolia*). This riparian area appears to be isolated and disjunct from other riparian vegetation, situated within a disturbed/ruderal area that eventually connects to Drainage 3 outside of the Project footprint.

4.3.3 Disturbed Black Willow-Red Willow Thickets

The majority of the Black Willow-Red Willow Thickets community northwest of Drainage 2 is invaded by several non-native species including non-native giant reed (*Arundo donax*), fan palm trees (*Washingtonia* sp.), and gum trees (*Eucalyptus* sp.). Because the community is composed of more than 25 percent non-native giant reed, this community has been classified as Disturbed Black Willow-Red Willow Thickets. This area is identified as an isolated swale feature (topographical depressional area) and does not have connectivity to any riparian vegetation or drainages.

4.3.4 Disturbed California Buckwheat Scrub

California Buckwheat Scrub is found in upland slopes, intermittently flooded arroyos, channels and washes, and rarely flooded low-gradient deposits. Soils are coarse, well drained, and moderately acidic to slightly saline (Sawyer et al. 2009). Stands do well on rocky sites and in shallow soils, and they establish after disturbance by fire or flood or after heavy grazing. In southern coastal California, this alliance is usually one of the first of the coastal scrubs to establish in mechanically disturbed areas such as road cuts or slope failures, and it persists in areas with light to moderate grazing (Sawyer et al. 2009). In this vegetation community, California buckwheat or yucca (*Hesperoyucca w*hipplei) is dominant or co-dominant in the shrub canopy in cismontane stands with California sagebrush, coyote brush (*Baccharis pilularis*), sticky monkeyflower (*Diplacus aurantiacus*), brittlebush sunflower, brittlebush (*Encelia farinosa*), coast goldenbush (*Isocoma menziesii*), deerweed (*Acmispon glaber*), white sage (*Salvia apiana*), or black sage (*Salvia mellifera*). Herbaceous layer is variable and may be grassy (Sawyer et al. 2009).

The majority of this community located around the culvert of Drainage 3 is comprised of non-native and ruderal vegetation. Because the community is composed of more than 25 percent of non-native and ruderal vegetation, this community has been classified as Disturbed California Buckwheat Scrub.

4.3.5 Disturbed/Ruderal

Disturbed and ruderal (weedy) areas are often a result of disturbances caused by humans. Most of the Project site was observed to be disturbed to some degree. Ruderal areas are typically characterized by heavily compacted or frequently disturbed soils. Plant species occurring in ruderal areas are adapted to survive in these conditions and readily colonize disturbed ground (Barbour et al. 1999).

Ruderal areas within the Project site exhibit varying degrees of past surface disturbance from soil grading and mowing to seasonal erosion from rain events and runoff near culverts. Areas of disturbance often have either no vegetation, sparse vegetation composed of non-native colonizing species, or larger amounts of vegetation composed of mostly non-native species. The vegetation surrounding Drainage 2 and Drainage 3 is dominated by non-native annual grasses such as brome (Bromus spp.) and glaucous foxtail barley (*Hordeum murinum*), mixed with scattered non-native shortpod mustard (*Hirschfeldia incana*), Russian thistle (*Salsola tragus*), castor bean (*Ricinus communis*), native calabazilla (*Cucurbita foetidissima*), common sunflower (*Helianthus annuus*), and Jimson weed (*Datura wrightii*).

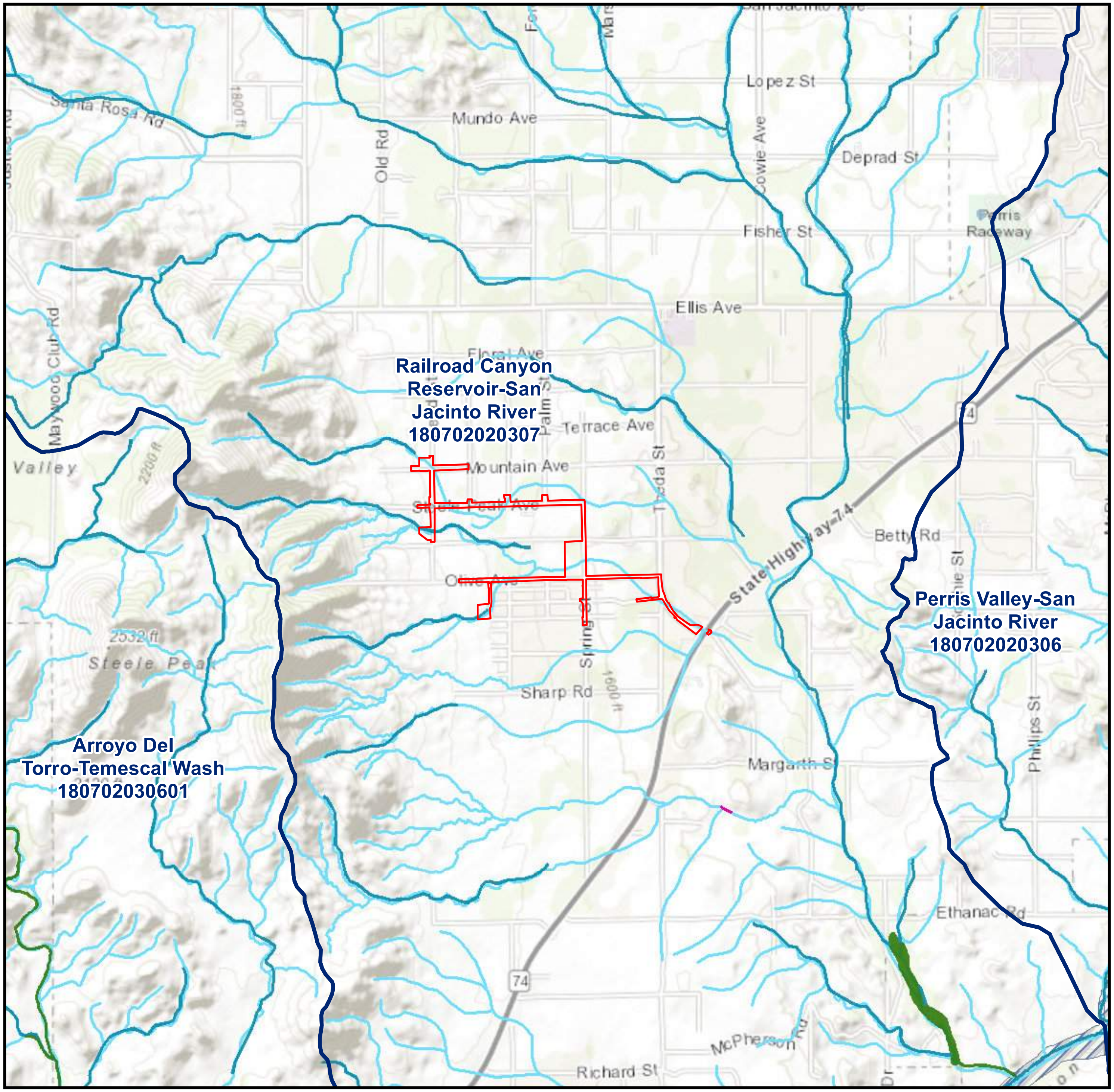
4.3.6 Exotic/Ornamental

Exotic/Ornamental landscaped areas include areas where the vegetation is dominated by non-native horticultural plants. Typically, the species composition consists of introduced trees, shrubs, flowers, and turf grass (Gray and Bramlet 1992). Within the Project site, a small patch of Exotic ornamental vegetation consisted primarily of planted non-native eucalyptus trees located in the area surrounding the SR-74 outlet area.

4.3.7 Disturbed/Dirt Roads

Disturbed areas are those areas that are devoid of vegetation (cleared or graded) such as dirt or gravel roads. These roads are proposed to be paved during Project activities and include Read Street, Mountain Avenue, and portions of Steele Peak Avenue.

Figure 2a
Good Hope-Olive Ave Storm Drain
Jurisdictional Waters



Project Location
FEMA Flood Zones
Watershed Boundary (HUC 12)

NWI

Freshwater Forested/Shrub Wetland
Freshwater Pond
Riverine

NHD

ArtificialPath
Connector
Stream/River

N

0 1,150 2,300 4,600
Feet

Name: 21382 JD Fig 2a Jurisdictional Waters.Mxd
Print Date: 1/12/2023, Author: pcarlos

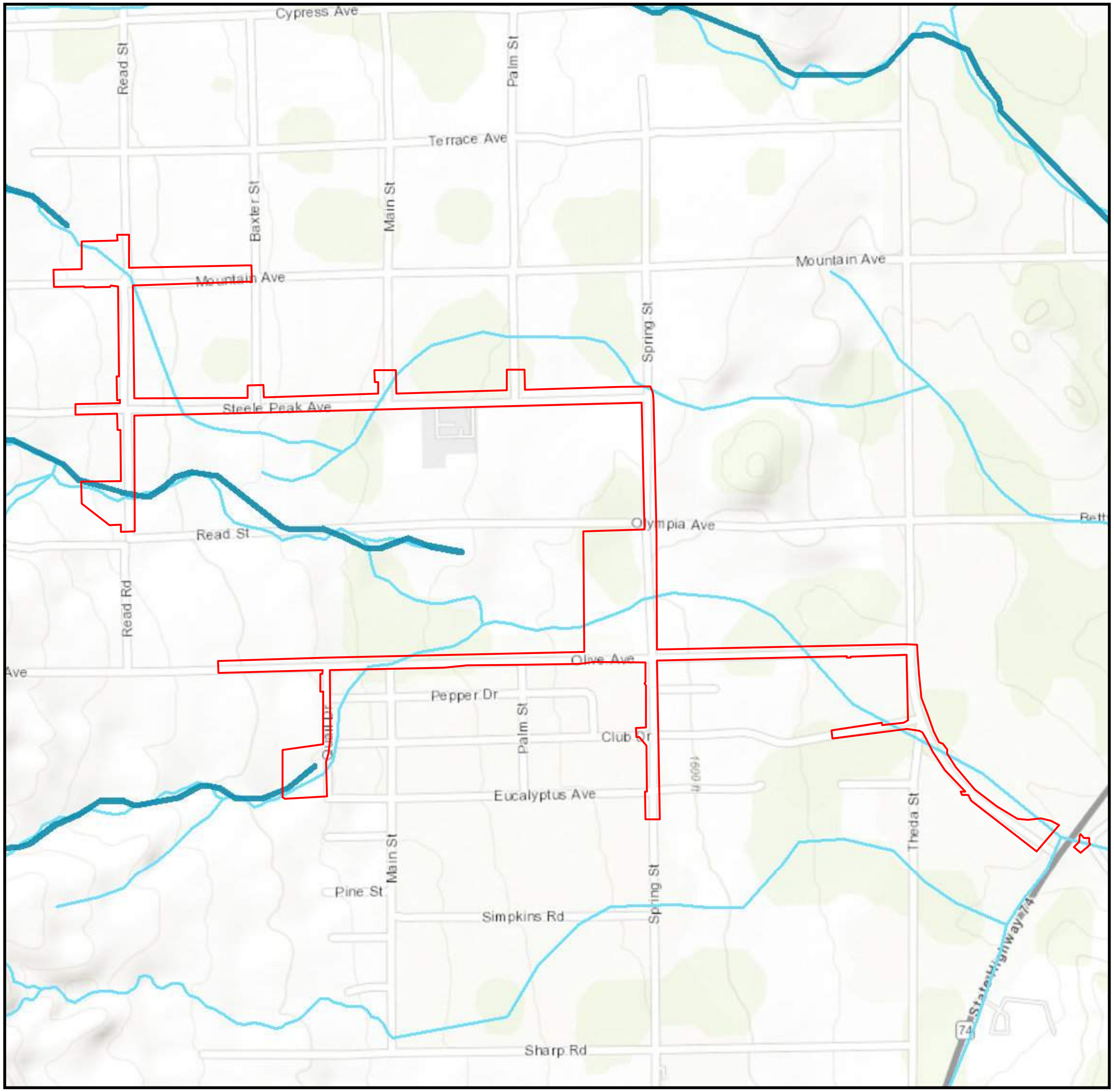


Figure 2b
Good Hope-Olive Ave Storm Drain
Jurisdictional Waters

Project Location

NWI

Riverine

NHD

StreamRiver

N

0 400 800 1,600

Feet

Name: 21382 JD Fig 2b Jurisdictional Waters.Mxd
Print Date: 1/19/2023, Author: pcarlos

CHAMBERS GROUP

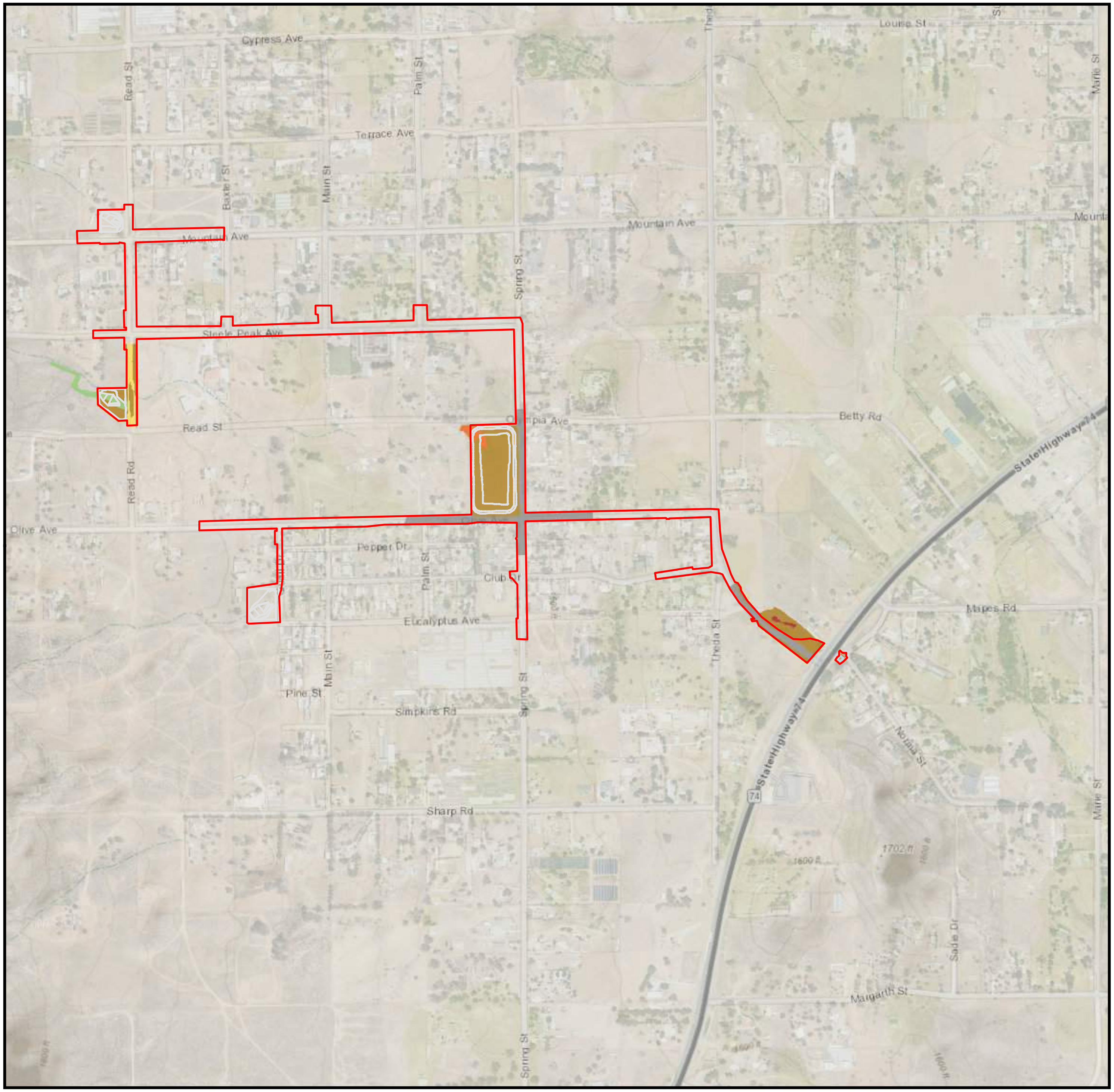


Figure 3
Good Hope-Olive Ave Storm Drain
Vegetation Communities
Overview

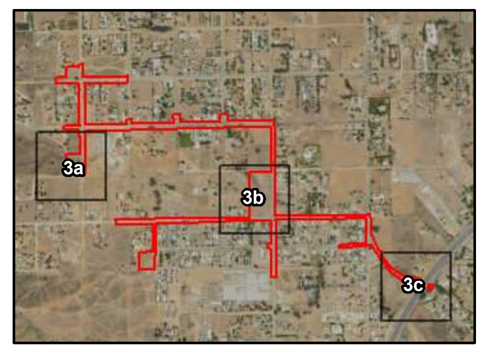
Project Location
Basin Linework
Grading
Rip-Rap

Vegetation Communities

Disturbed Buckwheat Scrub
Bareground
Black Willow-Red Willow Thickets
Disturbed Black Willow-Red Willow Thicket
Developed
Disturbed/Ruderal
Exotic Ornamental
Riversidean Sage Scrub/Non-Native Grassland
Ruderal

N

0 500 1,000 2,000
Feet



Name: 21382 BIO Fig 3 Vegetation Communities.Mxd
Print Date: 4/8/2024, Author: pcarlos

CHAMBERS GROUP

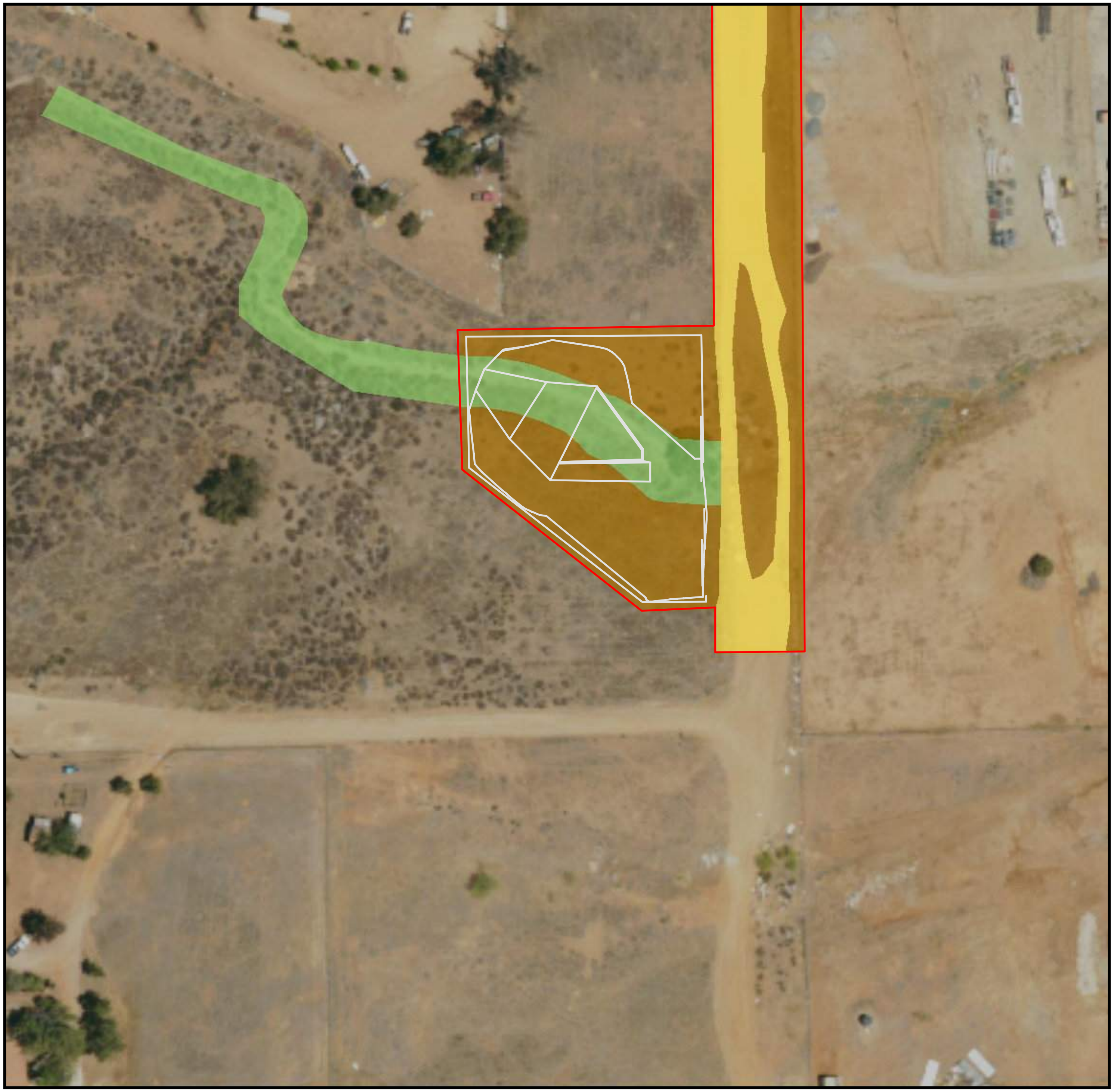


Figure 3a
Good Hope-Olive Ave Storm Drain
Vegetation Communities
Drainage 1

Project Location

Basin Linework

Vegetation Communities

Bareground

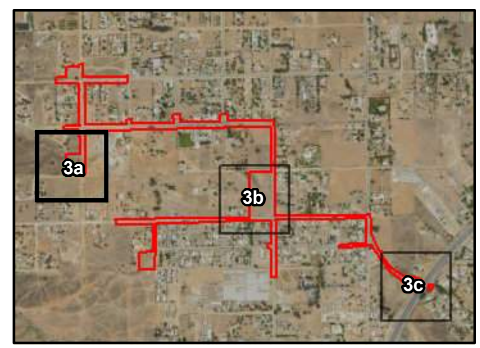
Disturbed/Ruderal

Riversidean Sage Scrub/Non-Native Grassland

N

0 62.5 125 250

Feet



Name: 21382 BIO Fig 3 Vegetation Communities.Mxd
Print Date: 4/8/2024, Author: pcarlos

CHAMBERS GROUP

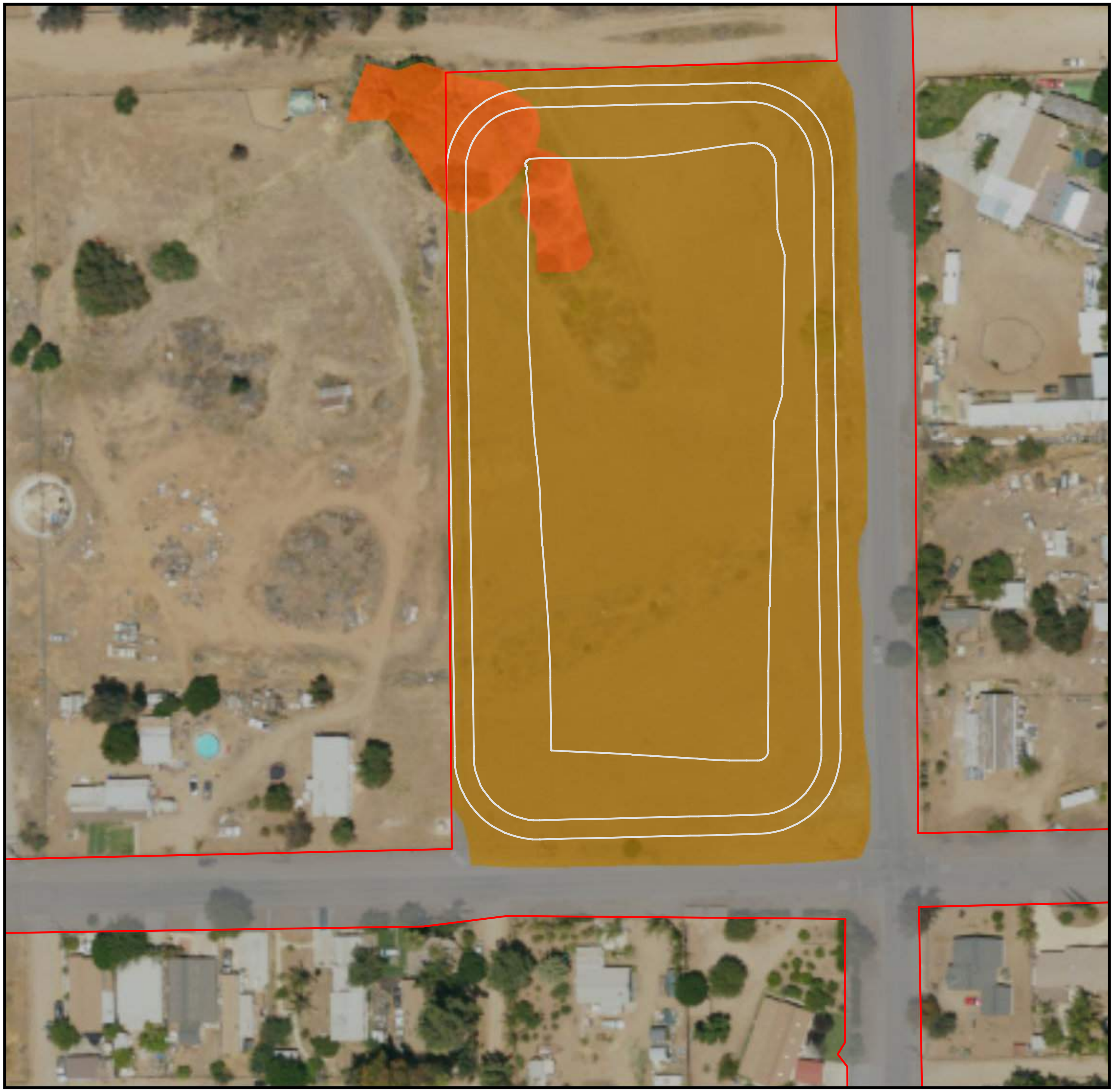


Figure 3b
Good Hope-Olive Ave Storm Drain
Vegetation Communities
Drainage 2

Project Location

Basin Linework

Vegetation Communities

Disturbed Black Willow-Red Willow Thicket

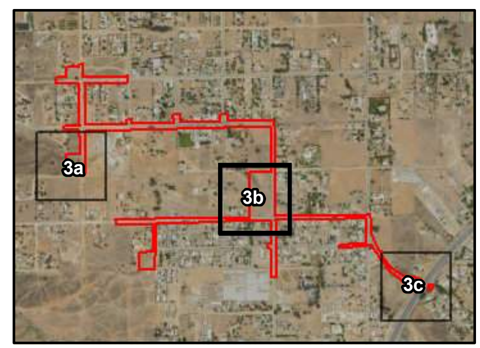
Developed

Disturbed/Ruderal

N

0 62.5 125 250

Feet



Name: 21382 BIO Fig 3 Vegetation Communities.Mxd
Print Date: 4/8/2024, Author: pcarlos

Figure 3c
Good Hope-Olive Ave Storm Drain
Vegetation Communities
Drainage 3

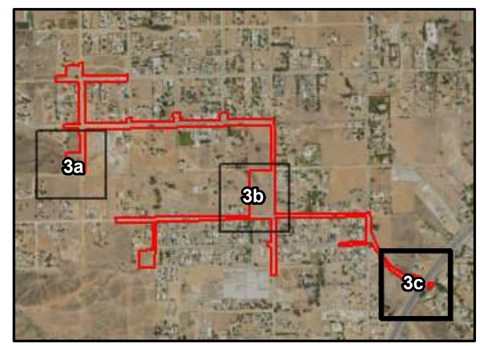
Project Location
Grading
Rip-Rap

Vegetation Communities

Disturbed Buckwheat Scrub
Black Willow-Red Willow Thickets
Developed
Disturbed/Ruderal
Exotic Ornamental
Ruderal

N

0 62.5 125 250
Feet



Name: 21382 BIO Fig 3 Vegetation Communities.Mxd
Print Date: 4/8/2024, Author: pcarlos

CHAMBERS GROUP

4.4. SOILS

After review of USDA Soil Conservation Service and by referencing the USDA NRCS Web Soil Survey (USDA 2022), it was determined that the Project site is located within the Western Riverside Area, California area CA679. Based on the results of the database search none of the soils present on site are classified as hydric soils. The Project site contains thirteen soil types:

Cajalco fine sandy loam (CaC2), 2 to 8 percent slopes and **Cajalco fine sandy loam (CaD2), 8 to 15 percent slopes** are moderately well drained soils typically found in linear or concave positions from 900 to 3,500 feet amsl. These soil profiles are typically composed of fine sandy loam, loam and weathered bedrock. These soils typically have a very well drained permeability, with medium runoff when wet. The soil is 20 to 40 inches to paralithic bedrock.

Cieneba rocky sandy loam (CkF2), 15 to 50 percent slopes are somewhat excessively drained soils usually found in concave and convex positions at elevations of 500 to 4000 feet amsl. The soil profile is composed of sandy loam and weathered bedrock. These soils have well drained permeability, with medium runoff when wet. The soil is 14 to 22 inches to paralithic bedrock.

Escondido fine sandy loam (EcC2), 2 to 8 percent slopes are well drained soils typically found on hills at elevations of 400 to 2,800 feet amsl. The soil profile is composed of fine sandy loam, silt loam, and unweathered bedrock. These soils have a high permeability with a medium runoff. The soil is 20 to 40 inches to lithic bedrock.

Fallbrook fine sandy loam (FfC2), 2 to 8 percent slopes and **Fallbrook fine sandy loam (FkD2), shallow, 8 to 15 percent slopes** are typically both well drained soils found on hills at elevations of 300 to 2,000 feet amsl. These soil profiles are composed of fine sandy loam, sandy clay loam, and bedrock. These soils have high permeability with a medium runoff. These soils are 10 to 40 inches to paralithic bedrock.

Friant fine sandy loam (FwE2), 5 to 25 percent slopes is a well-drained soil typically found on backslope or side slope from 500 to 5,800 feet amsl. The soil profile is typically composed of fine sandy loam and unweathered bedrock. These soils typically have a fast infiltration rate (low runoff potential) when thoroughly wet. The soil is 6 to 20 inches to lithic bedrock.

Hanford coarse sandy loam (HcC), 2 to 8 percent slopes is a well-drained soil typically found on alluvial fans from 680 to 6,930 feet amsl. The soil profile is typically composed of coarse sandy loam, fine sandy loam, and stratified loamy sand to coarse sandy loam. These soils typically have low runoff potential when thoroughly wet. The soil is more than 80 inches in depth to any restrictive features.

Monserate sandy loam (MmB), 0 to 5 percent slopes and **Monserate sandy loam (MmD2), 8 to 15 percent slopes** are typically both well drained soils found on alluvial fans at elevations of 700 to 2,500 feet amsl. These soil profiles are composed of sandy loam, sandy clay loam, indurated, cemented, and loamy coarse sand. These soils have high permeability with a medium to high runoff when wet. These soils are 20 to 39 inches to duripan.

Terrace escarpments (TeG) consist of long, narrow, rocky areas that rise abruptly from coastal plain terraces or plateaus. They do not have a drainage class and are found on terraces in concave and convex positions. The parent material is alluvium derived from mixed sources.

Yokohl loam (YbC), 2 to 8 percent slopes is a well-drained soil typically found on alluvial fans at elevations of 500 feet amsl. The soil profile is typically composed of loam, clay loam, indurated, and stratified sandy loam to gravelly loam. These soils typically have high permeability and very high runoff when wet. The soil is 20 to 39 inches to duripan.

Ysidora gravelly very fine sandy loam (YsC2), 2 to 8 percent slopes is a moderately well-drained soil typically found on alluvial fans at elevations of 500 to 2,500 feet amsl. The soil profile is typically composed of gravelly clay loam and cemented. These soils typically have high runoff when wet. The soil is 20 to 40 inches to duripan.

4.5. DRAINAGE FEATURES

The Project site has three ephemeral drainages that have defined channel beds and banks but lack any riparian habitat, and flow via surface hydrology only during seasonal rainfall events. These drainages do not meet the MSHCP definition of Riverine as they have no connectivity to downstream MSHCP Conservation areas and, therefore, do not contribute to the biological functions and values of downstream habitat for covered species within the MSHCP Conservation Area. Additionally, the drainages do not contain any riparian vegetation and the species listed in Section 6.1.2 of the MSHCP are not present and are not expected to occur within the Project area. The mapped drainages can be found in Figure 4.

Drainage 1 is located south of Steele Peak Avenue and east of Read Street. Feature 1 is a mapped NHD ephemeral feature and a NWI riverine within the Project boundary. The drainage receives flow from the surrounding mountains to the west of the property. The portion of the drainage within the Project site (west of Reed Street) is composed of Riversidean Sage Scrub/Non-native Grassland along the banks and is sparsely vegetated with non-native vegetation including brome, glaucous foxtail barley, and shortpod mustard within the channel. No riparian vegetation occurs within or along the banks of the feature. Bank to bank measurements ranged from 44 feet 9 inches to 50 feet 4 inches. OHWM measurements ranged from 8 feet 4 inches to 11 feet 6 inches.

The feature appears to have historically flowed east across Read Street into the property to the east; however, the property to the east has been heavily manipulated and the historical drainage no longer exists; flow appears to turn into sheet flow once it crosses the road, as no surface connectivity was observed downstream towards Drainage 2 (no channelization or OWHM was evident downstream). NWI riverine data (Figure 2b) shows the drainage continues southeastward for approximately 1,810 feet and terminates within the residential neighborhood. NHD data shows a historical stream that continuously flows through the residential area; however, no channelization or OHWM was observed from the western edge of the first property east of Reed Street, between Steele Peak Drive to the north and Olympia Avenue to the south.

Drainage 2 is located southeast of Drainage 1 within the proposed basin site on the northwest corner of Olive Avenue and Spring Street. Drainage 2 facilitates flow from both the properties to the west and road run-off (nuisance flow). According to the historical NHD maps (Figure 2B), Drainage 2 is connected downstream from Drainage 1; however, this area has been heavily manipulated from the property owners and developments between Drainage 1 and Drainage 2 and surface connectivity to Drainage 1 no longer exist. The historical drainage path has been heavily manipulated and altered, and both channelization and OHWM were not evident between these areas. In addition, no NWI riverine data exists for this location. Channelization for Drainage 2 was mapped approximately 545 feet west of the Project site and flows east.

The channelization is non-contiguous and appears to turn subsurface about half-way through the property until the eastern edge of the Project site where the surface water flows east into a culvert under Spring Street into a residential area. Drainage 2 is composed primarily of non-native vegetation including brome, glaucous foxtail barley and shortpod mustard along the banks and within the channel. No riparian vegetation occurs within or along the banks of the feature. Bank to bank measurements ranged from 14 feet 4 inches in the western portion of the site to 3 feet near the eastern portion. OHWM measurements ranged from 7 feet near the western portion to 6 inches near the eastern edge.

Drainage 3 occurs on the northwest corner of Theda Street and SR-74. Drainage 3 is a mapped NHD ephemeral drainage feature that receives flow primarily from two sources: residential and road run-off (nuisance water) from Theda Street and Club Drive; and from sheet flow from the residential area on the west side of Theda Street and Eucalyptus Avenue. The primary source of water in Drainage 3 is from the residential and road nuisance water just north of the drainage along the east side of Theda Street that eventually channelizes and flows in a southeast direction north of the Project footprint, and crosses into the Project immediately northwest of SR-74. Vegetation within Drainage 3 is composed primarily of non-native grasses and weeds. Bank to bank measured 12 feet and OHWM measured 2 feet 6 inches. The secondary source of water is from the residential area on the west side of Theda Street (outside of the Project footprint) that collects water in a swale feature (small isolated topographical depressional area), composed of ruderal vegetation including non-native grasses, shortpod mustard, Russian thistle and castor bean. Water eventually flows into a 7-foot wide by 4-foot-tall reinforced concrete box culvert under Theda Street (within the Project footprint) and continues southeast of the Project. A sparsely vegetated Black Willow – Red Willow thickets community (outside and adjacent to the Project boundaries) receives water on the east side of Theda Street and connects via sub-surface flow to Drainage 3 outside of the Project footprint.

Outside (south) of the Project area on the southeast side of SR-74, Drainage 3 continues to flow southeast through a residential area for 0.29 mile into a private property that has been heavily manipulated and altered where it terminates. Based on field observations in the area, no evidence of channelization was observed throughout the property or further east of this point; therefore, no connectivity to a TNW (significant nexus) exists for Drainage 3.

4.6. CDFW/MSHCP RIPARIAN HABITAT

No NWI mapped wetlands were identified within the Project site. However, an isolated Disturbed Black Willow – Red Willow Thicket area occurs northwest of Drainage 2 within the proposed Project basin and is dominated by non-native giant reed, with native black and red willows, and non-native Mexican fan palms scattered throughout. This area is located in a topographical depressional area located in the northwest corner of the proposed water detention basin near Olympia Avenue, west of Spring Street. This feature appears to receive water primarily from sheet flow along Olympia Avenue and the property to the north, an active orchard, which slopes down toward the road, and the property to the west. No evidence of hydrological connectivity to a drainage (i.e., Drainage 2) was observed within the area; however, due to the presence of mature hydrophytic vegetation, a wetland delineation survey was conducted. One formal soil pit and several test pits were investigated and revealed sandy loam soil profiles with very little silt or clay content. Soil color consisted of 100 percent 7.5YR 4/2 (GretagMacbeth 2009) up to 18 inches with no redox features observed that would indicate hydric soils. The wetland delineation revealed characteristics of hydrophytic vegetation but the Prevalence Index value of 3.63 was not enough to show hydrophytic vegetation dominance due to lack of facultative wetland shrub species and dominance of non-native grasses. The area also lacked wetland hydrology indicators and lacked the presence of hydric soils; therefore, this area is considered non-wetland, isolated swale feature (depressional feature) comprised of Disturbed Black Willow – Red Willow Thickets vegetation. The swale feature receives nuisance water from the residential area; however, no evidence of connectivity from the swale area downstream to any other water features was observed. In addition, this area is not within a criteria cell and does not provide long-term habitat value for the species listed in Section 6.1.2 for the MSHCP. Therefore, the swale is not under CDFW jurisdiction and should not be considered an MSHCP Riparian area. Soil data collected during the delineation can be found in the Wetland Determination Data Forms – Arid West Region presented in Appendix B.

A small riparian area occurs just southwest of Drainage 3, outside of the Project boundary. This area receives nuisance flow from the surrounding residential area and from Eucalyptus Avenue and Theda Street, which collects in a swale feature southwest of the Project site, then enters the culvert located along the west side of Theda Street. The riparian area has a channelized bank to bank and OHWM, then appears to turn sub-surface before ultimately flowing into Drainage 3. This riparian area is sparsely vegetated with black and red willows and mulefat scattered throughout with an understory of non-native grassland and is classified as Black Willow – Red Willow Thickets. Because the area is located outside of the Project boundary, a formal soil pit was not taken. However, a test pit was investigated and revealed soils consisting of 100 percent 7.5YR 4/2 (GretagMacbeth 2009) of up to 18 inches with no redox features observed. Although hydrophytic vegetation is present within this area, no hydric soils were observed within the area; therefore, this riparian area is not considered to be a three-parameter wetland area. Since bank-to-bank channelization and connectivity to Drainage 3 was observed, this area should be considered under CDFW jurisdiction and an MSHCP Riparian area. This MSCHP Riparian area is located outside of the Project and will not be directly impacted by Project activities. Project designs will allow for the riparian area to continue to receive flow after improvements and the riparian area will continue to receive sheet and nuisance flow from the surrounding area. Therefore, no indirect impacts are anticipated to occur to this area as a result of Project activities.

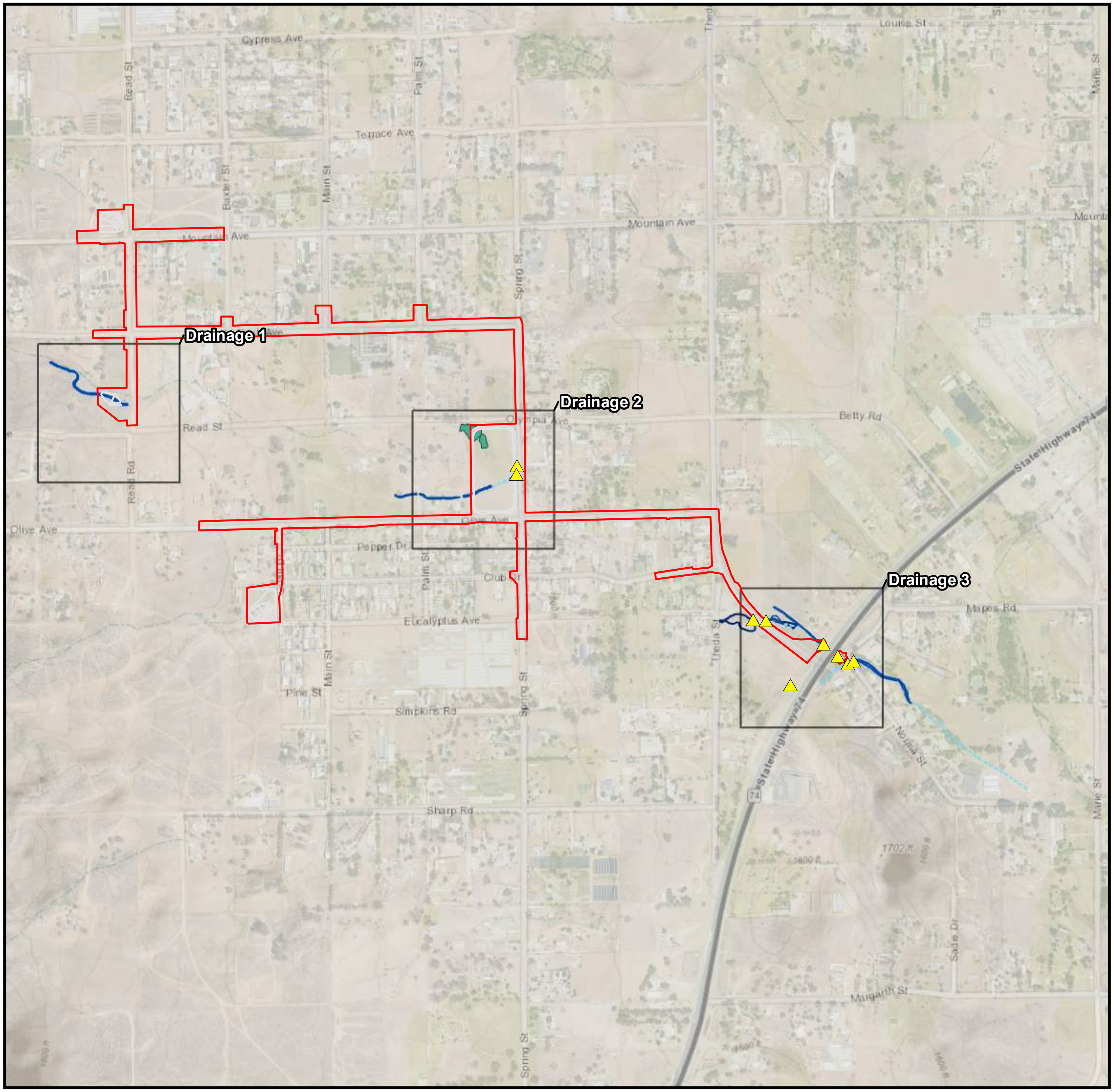


Figure 4
Good Hope-Olive Ave Storm Drain
Jurisdictional Delineation
Overview

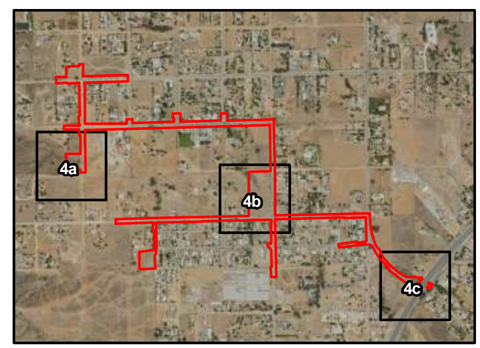
- Project Location
- Basin Linework
- Grading
- Rip-Rap

Jurisdictional Delineation

- Bank to Bank
- Ordinary High Water Mark
- Non-Jurisdictional Swale
- Culvert
- Sub-Surface Flow
- Swale

N

0 500 1,000 2,000
Feet



Name: 21382 BIO Fig 4 Jurisdictional Delineation.Mxd
Print Date: 7/18/2024, Author: pcarlos

CHAMBERS GROUP

Figure 4a
Good Hope-Olive Ave Storm Drain
Jurisdictional Delineation
Drainage 1

Project Location

Basin Linework

Jurisdictional Delineation

Bank to Bank

Ordinary High Water Mark

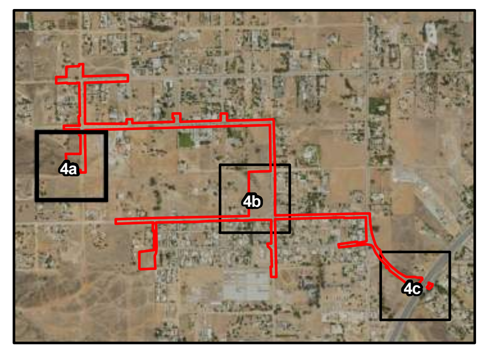
Sub-Surface Flow

RWQCB Jurisdictional	Temporary Impact (ac)	Permanent Impact (ac)
Drainage 1	0.00	0.05
CDFW Jurisdictional	**Temporary Impact (ac)**	**Permanent Impact (ac)**
Drainage 1	0.00	0.20

N

0 62.5 125 250

Feet



Name: 21382 BIO Fig 4 Jurisdictional Delineation.Mxd
Print Date: 7/19/2024, Author: pcarlos

CHAMBERS GROUP

Figure 4b

Good Hope-Olive Ave Storm Drain
Jurisdictional Delineation
Drainage 2

Project Location

Basin Linework

Jurisdictional Delineation

Bank to Bank

Ordinary High Water Mark

Non-Jurisdictional Swale

Culvert

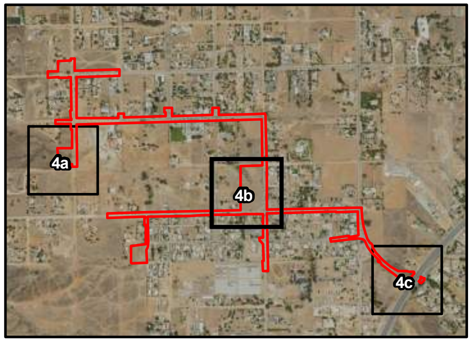
Sub-Surface Flow

RWQCB Jurisdictional	Temporary Impact (ac)	Permanent Impact (ac)
Drainage 2	0.01	0.01
CDFW Jurisdictional	**Temporary Impact (ac)**	**Permanent Impact (ac)**
Drainage 2	0.02	0.03

N

0 62.5 125 250

Feet



Name: 21382 BIO Fig 4 Jurisdictional Delineation.Mxd
Print Date: 7/19/2024, Author: pcarlos

CHAMBERS GROUP

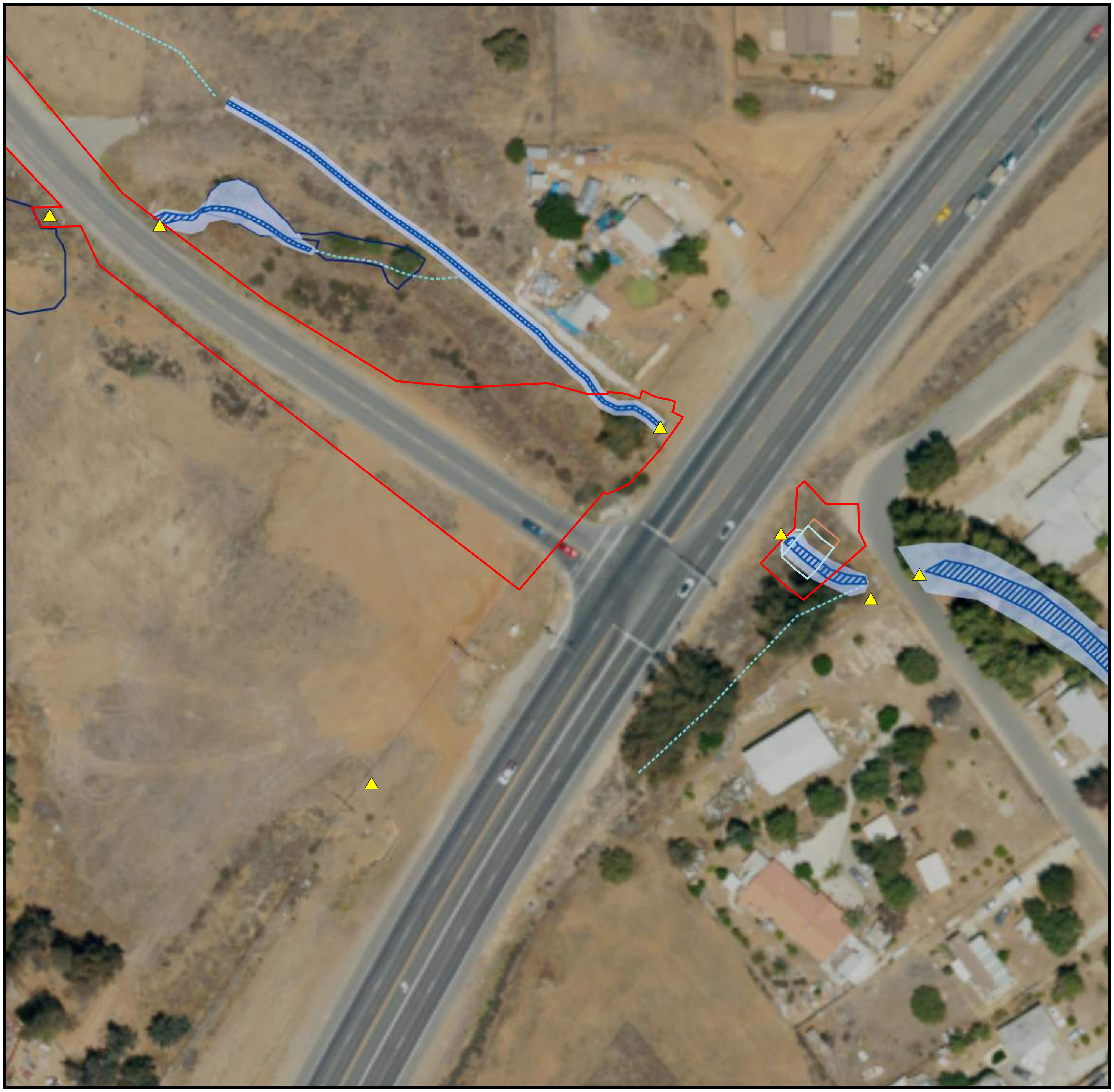


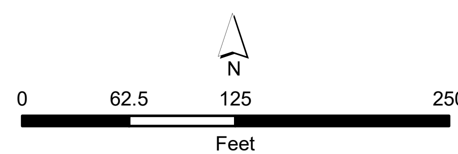
Figure 4c
Good Hope-Olive Ave Storm Drain
Jurisdictional Delineation
Drainage 3

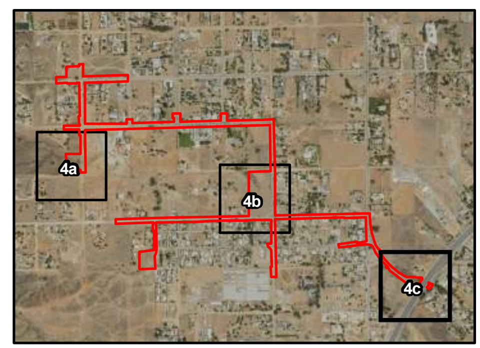
Project Location
Grading
Rip-Rap

Jurisdictional Delineation

Bank to Bank
Ordinary High Water Mark
Culvert
Sub-Surface Flow
Swale

RWQCB Jurisdictional	Temporary Impact (ac)	Permanent Impact (ac)
Drainage 3	0.00	0.003
CDFW Jurisdictional	Temporary Impact (ac)	Permanent Impact (ac)
Drainage 3	0.00	0.02





Name: 21382 BIO Fig 4 Jurisdictional Delineation.Mxd
Print Date: 7/19/2024, Author: pcarlos

CHAMBERS GROUP

4.7. SUMMARY OF JURISDICTIONAL FINDINGS

A total of three ephemeral drainages with upland vegetation were identified during the delineation. These areas are subject to RWQCB and CDFW jurisdiction. The results of this JD document the investigation, best professional judgement, and conclusions of Chambers Group. However, all jurisdictional determinations should be considered preliminary until reviewed and approved by the regulatory agencies. Table 1 provides a summary of acreages of Jurisdictional Waters that occur within the Project site.

Table 1. Summary of Acreages of Potential Jurisdictional Waters that Occur Within the Impact Areas of the Project Site

Potential Jurisdictional Waters	Temporary Impact (Acres)	Temporary Impact (Square Feet)	Permanent Impact (Acres)	Permanent Impact (Square Feet)
RWQCB Jurisdictional Total	**0.009**	**400.64**	**0.062**	**2,698.14**
Drainage 1	0	0	0.045	1,939.15
Drainage 2	0.009	400.64	0.014	612.37
Drainage 3	0	0	0.003	146.62
Total Non-Wetland Waters of the State	*0.009*	*400.64*	*0.062*	*2,698.14*
CDFW Jurisdictional Total	**0.019**	**822.59**	**0.249**	**10,829.92**
Drainage 1	0	0	0.204	8,871.93
Drainage 2	0.019	822.59	0.029	1,255.85
Drainage 3	0	0	0.016	702.14
Streambed (upland vegetated)	*0.019*	*822.59*	*0.249*	*10,829.92*

4.7.1 <u>Potential USACE Jurisdiction</u>

The USACE regulates discharge of dredged or fill material into WoUS. These waters would include wetland and non-wetland bodies of water that meet specific criteria. USACE regulatory jurisdiction pursuant to Section 404 of the Clean Water Act (CWA) is founded on a connection, or nexus, between the water body in question and a traditional navigable water, territorial sea, or an interstate commerce. This connection may be direct, through a tributary system linking a stream channel with TNW and is focused on whether the subject waters may significantly affect the chemical, physical, or biological integrity of these downstream waters. Based on database review and field observations during the delineation, no evidence of hydrologic connectivity (channelization or OHWM) was observed between the three drainages within the Project site due to the significant manipulation from the property owners and developments in the area. In addition, the most southeast drainage (Drainage 3) was no longer channelized approximately 0.29 miles to the southeast of the Project. No connectivity to a TNW (significant nexus) exists for the drainages mapped within the Project. In addition, no waters subject to SWANCC are present within the Project site. Therefore, no WoUS were identified within the Project site, and drainages identified during the delineation would not be subject to USACE jurisdiction pursuant to Section 404 of the CWA.

4.7.2 Potential RWQCB Jurisdiction

RWQCB jurisdiction includes all USACE jurisdictional areas, OHWMs, and any other features that influence surface or subsurface water quality within California. The RWQCB would have jurisdiction over surface waters, which may be identified as ephemeral waters, including those indicated by a change in the average sediment texture, a change in vegetation cover, and/or a break in bank slope. A total of 0.07 acre of non-wetland waters of the State under the potential jurisdiction of the RWQCB occur in the Project site. The limits of RWQCB jurisdiction were defined by the OHWM and surface waterbody features within the Project site.

4.7.3 Potential CDFW jurisdiction

There is 0.268 acre within the Project site that have upland vegetated bank to bank within the Project site that are potentially regulated by CDFW’s Lake and Streambed Alteration Agreement program. CDFW’s jurisdiction extends from the top of bank to top of bank and any adjacent wetlands or riparian canopies. The three ephemeral drainage features provide surface waters when water is present and are potentially considered State waters.

While the isolated swale feature near Drainage 2 will be directly impacted as a result of the construction of the detention basin, this area lacks evidence of wetland hydrology or hydric soils, and therefore is not classified as a wetland. This area receives nuisance water from the residential properties surrounding the area, and no hydrologic connectivity to Drainage 2 or any other drainage was identified during the survey. Therefore, this area should not be considered under CDFW jurisdiction.

No direct impacts to the riparian area near Drainage 3 (outside Project site) are anticipated to occur as a result of the Project. While hydrophytic vegetation is present within this area, no indicators of wetland hydrology or hydric soils were observed; therefore, this area is not considered a wetland. Project designs will allow for the riparian area to continue to receive flow after improvements and the riparian area will continue to receive sheet and nuisance flow from the surrounding area. Therefore, no direct or indirect impacts are anticipated to occur to this area as a result of Project activities.

SECTION 5.0 – CONCLUSION

All jurisdictional determinations should be considered preliminary until reviewed and approved by the regulatory agencies.

5.1. FEDERAL PERMITS

Based on the results this delineation, USACE does not have jurisdiction over this Project, a CWA Section 404 Permit is not required.

5.2. STATE PERMITS

Based on the results of this delineation, a total of 0.07 acre of non-wetland waters of the State under the potential jurisdiction of the RWQCB occur in the Project site; 0.07 acre may be impacted by diversion of the water flow into the proposed detention basin and the proposed placement of the drainage pipes and inlet structures. The addition of the approximately 1.88-acre detention basin bottom will result in an overall increase in surface waters. However, a Waste Discharge Requirements (WDR) permit is likely to be required by RWQCB for this Project. The Project may be eligible to be covered under Statewide WDR General Order Number 2004-0004-DWQ, which is restricted to dredge and fill discharges of less than 0.2 acre, 400 linear feet, and 50 cubic yards. The impact assessment is based on existing plans that are subject to change based on final design.

Based on this delineation, there is 0.268 acre within the Project site that has upland vegetated bank to bank and within the Project site. Therefore, CDFW has jurisdiction over a total of 0.268 acre of streambed; 0.268 acre will be impacted by the proposed detention basin as well as the diversion of water flow for through the proposed drainage pipes and culvert replacements. Upland vegetation occurs within and adjacent to the drainage features within the Project site. As stated previously, CDFW regulates impacts or alterations to streambeds, including any obstruction or diversion to the natural flow of a stream, substantial change or use of material from a stream, or a deposit or disposal of any debris into a stream as part of Fish and Wildlife Code Sections 1600-02. Therefore, a Streambed Alteration Agreement (SAA) is likely to be required from CDFW for this Project. Impacts to these jurisdictional areas may be offset through construction of the basin by creating up to approximately 1.88 acres of jurisdictional basin bottom.

A total of 0.071 acre of unvegetated streambeds was mapped within the Project impact area. The unvegetated streambeds do not meet the MSHCP definition of Riverine as they have no connectivity to downstream MSHCP Conservation areas and, therefore, do not contribute to the biological functions and values of downstream habitat for covered species within the MSHCP Conservation Area. Additionally, species listed in Section 6.1.2 of the MSHCP are not present and are not expected to occur within the Project area. For these reasons, the District, as a Permittee to the MSHCP, has determined that a Determination of Biologically Equivalent or Superior Preservation (DBESP) is not warranted for this Project.

Permitting conditions to offset impacts to the unvegetated streambed will be identified during coordination through the regulatory permitting process with the regulatory agencies (USACE, CDFW, RWQCB) and may include compensatory mitigation, avoidance, or nonnative plant removal within the communities.

SECTION 6.0 – REFERENCES

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

Barbour, M.G., J.H. Burk, W.D. Pitts, F.S. Gilliam, and M.W. Schwartz
1999 Terrestrial Plant Ecology, Third Edition. Addison Wesley Longman, Inc. Menlo Park, CA.

California State Water Resources Control Board
2018 Porter-Cologne Water Quality Act, Water Code Division 7 and Related Sections (As Amended, including Statutes 2017), January 2018.

Google
2022 Google Earth Pro, 7.3.1.4507 (64-bit). Microsoft Windows (6.2.9200.0). kh.google.com Accessed December 2022.

MSHCP
2022 MSHCP - Western Riverside Multiple Species Habitat Conservation Plan. 2004. Accessed December 2022 from https://www.wrc-rca.org/Permit_Docs/MSHCP/MSHCP-Volume%201.pdf

Psomas
2019 Habitat Assessment with a Jurisdictional Delineation for the Good Hope-Olive Avenue Storm Drain Project Report. December 2019.

Reed, Jr., P. B.
2016 National List of Plant Species That Occur in Wetlands: California (Region 0). U.S. Fish and Wildlife Service Biological Report 88 (26.10).

Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens
2009 A Manual of California Vegetation, Second Edition. California Native Plant Society, Sacramento, California.

University of California
2023 University of California Agricultural and Natural Resources weather data for Perris, CA. Accessed January 2023.

U.S. Army Corps of Engineers (USACE)
1987 U.S. Army Corps of Engineers Wetlands Delineation Manual. Wetlands Research Program Technical Report Y-87-1. Department of the Army, Vicksburg, Virginia. U.S. Army Waterways Experiment Station. Hickman. J.C. [ed.].

2007 Jurisdictional Determination Form Instructional Guidebook, Prepared by USACE and Environmental Protection Agency.

2008a A Field Guide to the Identification of the OHWM in the Arid West Region of the Western U.S., A Delineation Manual.

2008b Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0), ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-08-28. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS)
2022 USDA Web Soil Survey. http://websoilsurvey.nrcs.usda.gov/. Accessed December 2022.

U.S. Geological Survey
1973 Steele Peak 7.5-minute quadrangle. https://nationalmap.gov/ustopo/. Accessed December 2022.

APPENDIX A – REGULATORY FRAMEWORK

1.1 FEDERAL JURISDICTION

1.1.1 United States Army Corps of Engineers

Pursuant to Section 404 of the CWA, the United States Army Corps of Engineers (USACE) regulates the discharge of dredged and/or fill material into waters of the United States. The term "waters of the United States" is defined by 33 Code of Federal Regulations (CFR) Part 328 and currently includes: (1) all navigable waters (including all waters subject to the ebb and flow of the tide), (2) all interstate waters and wetlands, (3) all other waters (e.g., lakes, rivers, intermittent streams) that could affect interstate or foreign commerce, (4) all impoundments of waters mentioned above, (5) all tributaries to waters mentioned above, (6) the territorial seas, and (7) all wetlands adjacent to waters mentioned above. Waters of the United States do not include (1) waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the Clean Water Act (CWA), and (2) prior converted cropland. Waters of the United States typically are separated into two types: (1) wetlands and (2) "other waters" (non-wetlands) of the United States.

Wetlands are defined by 33 CFR 328.3(b) as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support … a prevalence of vegetation typically adapted for life in saturated soil conditions." In 1987, USACE published a manual (1987 Wetland Manual) to guide its field personnel in determining jurisdictional wetland boundaries. This manual was amended in 2008 to the USACE 2008 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0) (2008 Arid West Supplement). Currently, the 1987 Wetland Manual and the 2008 Arid West Supplement provide the legally accepted methodology for identification and delineation of USACE-jurisdictional wetlands in southern California.

In the absence of wetlands, the limits of USACE jurisdiction in nontidal waters, including intermittent Relatively Permanent Water (RPW) streams, extend to the Ordinary High Water Mark (OHWM), which is defined by 33 CFR 328.3(e) as:

> *… that line on the shore established by the fluctuation of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.*

On January 9, 2001, the U.S. Supreme Court ruled (in *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*) (SWANCC) that USACE jurisdiction does not extend to previously regulated isolated waters, including but not limited to isolated ponds, reservoirs, and wetlands. Examples of isolated waters that are affected by this ruling include vernal pools, stock ponds, lakes (without outlets), playa lakes, and desert washes that are not tributary to navigable or interstate waters or to other jurisdictional waters. A joint legal memorandum by EPA and USACE was signed on January 15, 2003.

In May 2007, USACE and EPA jointly published and authorized the use of the *Jurisdictional Determination Form Instructional Guidebook* (USACE 2007). The form and guidebook define how to determine if an area is USACE jurisdictional and if a significant nexus exists per the Rapanos decision. A nexus must have more than insubstantial and speculative effects on the downstream TNW to be considered a significant nexus. This guidebook is updated by the 2008 Arid West Supplement, the 2010 *Updated Datasheet for the*

Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States, and the 2011 *Ordinary High Flows and the Stage-Discharge Relationship in the Arid West Region*.

A joint guidance by EPA and USACE was issued on June 5, 2007, and revised on December 2, 2008, is consistent with the Supreme Court's decision in the consolidated cases *Rapanos v. United States* and *Carabell v. United States* (126 S. Ct. 2208 [2006]) (*Rapanos*), which addresses the jurisdiction over waters of the United States under the CWA (33 U.S.C. §1251 et seq.). A draft guidance was circulated in April 2011 to supercede both the 2003 SWANCC guidance and 2008 *Rapanos* decision; however, this guidance is not finalized and lacks the force of law.

USACE will continue to assert jurisdiction over Traditionally Navigable Waters (TNWs), wetlands adjacent to TNW, non-navigable tributaries of TNW that are Relatively Permanent Waters (RPW) where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months), and wetlands that directly abut such tributaries.

USACE generally will not assert jurisdiction over swales or erosional features (e.g., gullies or small washes characterized by low volume, infrequent, or short duration flow) or nontidal drainage ditches (including roadside ditches) that are (1) excavated wholly in and draining only uplands and (2) that do not carry a relatively permanent flow of water. USACE defines a drainage ditch as:

> *A linear excavation or depression constructed for the purpose of conveying surface runoff or groundwater from one area to another. An "upland drainage ditch" is a drainage ditch constructed entirely in uplands* (*i.e., not in waters of the United States*) *and is not a water of the United States, unless it becomes tidal or otherwise extends the ordinary high water line of existing waters of the United States.*

Furthermore, USACE generally does not consider "[a]rtificially irrigated areas which would revert to upland if the irrigation ceased" to be subject to their jurisdiction. Such irrigation ditches are linear excavations constructed for the purpose of conveying agricultural water from the adjacent fields. Therefore, such agricultural ditches are not considered to be subject to USACE jurisdiction.

USACE will use fact-specific analysis to determine whether waters have a significant nexus with (1) TNW for nonnavigable tributaries that are not relatively permanent (non-RPW); (2) wetlands adjacent to nonnavigable tributaries that are not relatively permanent; and (3) wetlands adjacent to, but that do not directly abut, a relatively permanent nonnavigable tributary. According to USACE, *"a significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical and biological integrity of downstream traditional navigable waters,"* including consideration of hydrologic and ecologic factors. A primary component of this determination lies in establishing the connectivity or lack of connectivity of the subject drainages to a TNW.

1.2 STATE JURISDICTION

The State of California (State) regulates discharge of material into waters of the State pursuant to Section 401 of the CWA as well as the California Porter-Cologne Water Quality Control Act (Porter-Cologne; California Water Code, Division 7, §13000 et seq.). Waters of the State are defined by Porter-Cologne as "any surface water or groundwater, including saline waters, within the boundaries of the state" (Water

Code Section 13050(e)). Waters of the State broadly includes all waters within the State's boundaries (public or private), including waters in both natural and artificial channels.

1.2.1 Regional Water Quality Control Board

Under Porter-Cologne, the State Water Resources Control Board (SWRCB) and the local Regional Water Quality Control Boards (RWQCB) regulate the discharge of waste into waters of the State. Discharges of waste include "fill, any material resulting from human activity, or any other 'discharge' that may directly or indirectly impact 'waters of the state.'" Porter-Cologne reserves the right for the State to regulate activities that could affect the quantity and/or quality of surface and/or groundwaters, including isolated wetlands, within the State. Wetlands were defined as waters of the State if they demonstrated both wetland hydrology and hydric soils. Waters of the State determined to be jurisdictional for these purposes require, if impacted, waste discharge requirements (WDRs).

When an activity results in fill or discharge directly below the OHWM of jurisdictional waters of the United States (federal jurisdiction), including wetlands, a CWA Section 401 Water Quality Certification is required. If a proposed project is not subject to CWA Section 401 certification but involves activities that may result in a discharge to waters of the State, the project may still be regulated under Porter-Cologne and may be subject to waste discharge requirements. In cases where waters apply to both CWA and Porter-Cologne, RWQCB may consolidate permitting requirements to one permit.

1.2.2 California Department of Fish and Wildlife

Pursuant to Division 2, Chapter 6, Sections 1600-1602 of the California Fish and Game Code, the California Department of Fish and Wildlife (CDFW) regulates all diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake, which supports fish or wildlife.

CDFW defines a "stream" (including creeks and rivers) as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having surface or subsurface flow that supports or has supported riparian vegetation" (California Code of Regulations, Title 14, Section 1.72). The jurisdiction of CDFW may include areas in or near intermittent streams, ephemeral streams, rivers, creeks, dry washes, sloughs, blue-line streams that are indicated on USGS maps, watercourses that may contain subsurface flows, or within the flood plain of a water body. CDFW's definition of "lake" includes "natural lakes or man-made reservoirs." CDFW limits of jurisdiction typically include the maximum extents of the uppermost bank-to-bank distance and/or the outermost extent of riparian vegetation dripline, whichever measurement is greater.

In a CDFW guidance of stream processes and forms in dryland watersheds (Vyverberg 2010), streams are identified as having one or more channels that may all be active or receive water only during some high flow event. Subordinate features, such as low flow channels, active channels, banks associated with secondary channels, floodplains, and stream-associated vegetation, may occur within the bounds of a single, larger channel. The water course is defined by the topography or elevations of land that confine a stream to a definite course when its waters rise to their highest level. A watercourse is defined as a stream with boundaries defined by the maximal extent or expression on the landscape even though flow may otherwise be intermittent or ephemeral.

Artificial waterways such as ditches (including roadside ditches), canals, aqueducts, irrigation ditches, and other artificially created water conveyance systems also may be under the jurisdiction of CDFW. CDFW may claim jurisdiction over these features based on the presence of habitat characteristics suitable to support aquatic life, riparian vegetation, and/or stream-dependent terrestrial wildlife. As with natural waterways, the limit of CDFW jurisdiction of artificial waterways includes the uppermost bank-to-bank distance and/or the outermost extent of riparian vegetation dripline, whichever measurement is greater.

CDFW does not have jurisdiction over wetlands, but has jurisdiction to protect against a net loss of wetlands. CDFW supports the wetland criteria recognized by USFWS; one or more indicators of wetland conditions must exist for wetlands conditions to be considered present. The following is the USFWS-accepted definition of a wetland:

> Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification, wetlands must have one or more of the following three attributes: (1) at least periodically, the lands supports hydrophytes, (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year (Cowardin et al. 1979).

In *A Clarification of the U.S. Fish and Wildlife Service's Wetland Definition* (Tiner 1989), the USFWS definition was further clarified "that in order for any area to be classified as wetland by the Service, the area must be periodically saturated or covered by shallow water, whether wetland vegetation and/or hydric soils are present or not; this hydrologic requirement is addressed in the first sentence of the definition." When considering whether an action would result in a net loss of wetlands, CDFW will extend jurisdiction to USFWS-defined wetland conditions where such conditions exist within the riparian vegetation that is associated with a stream or lake and does not depend on whether those features meet the three-parameter USACE methodology of wetland determination. If impacts to wetlands under the jurisdiction of CDFW are unavoidable, a mitigation plan will be implemented in coordination with CDFW to support the CDFW policy of "no net loss" of wetland habitat.

APPENDIX B – WETLAND DETERMINATION FORM

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Good Hope-Olive Storm Drain Project City/County: Perris/Riverside Sampling Date: 11-3-2022

Applicant/Owner: Riverside County Flood Control and Water District State: CA Sampling Point: 1

Investigator(s): H. Franklin, A. Burke Section, Township, Range: 03, 5S 4W

Landform (hillslope, terrace, etc.): Depression Area Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR): ____ Lat: 33.760601 N Long: -117.280763 W Datum: 11N

Soil Map Unit Name: Western Riverside Area, California area CA679 NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?		✔
Hydric Soil Present?		✔
Wetland Hydrology Present?		✔

Is the Sampled Area within a Wetland? Yes ____ No ✔

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Willow SP.	60	X	FACW
2. Arundo Donax	20		FACW
3.			
4.			
	80	= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1. N/A			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: ____)			
1. Non-native grasses	95	X	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	95	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1. N/A			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	80	x 2 =	160
FAC species		x 3 =	
FACU species		x 4 =	
UPL species	95	x 5 =	475
Column Totals:	175 (A)		635 (B)

Prevalence Index = B/A = 3.63

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ✔ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✔

Remarks:

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	7.5 YR 4/2	100					Sandy Loa	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? **Yes** ___ **No** ✔

Remarks:

No soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?		✔	
Water Table Present?		✔	
Saturation Present? (includes capillary fringe)		✔	

Wetland Hydrology Present? **Yes** ___ **No** ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX C – SITE PHOTOGRAPHS

APPENDIX C – SITE PHOTOGRAPHS

Photo 1.

Upstream of Drainage 1 flowing in a southeast direction. Photo is facing southeast.

Photo 2.

Drainage 1 receives water flow from the surrounding mountains to the west during heavy rain events. Photo is facing northwest.

Photo 3.

Drainage 1 just before it terminates at the dirt road near the eastern boundary of the Project site. Photo is facing southeast.

Photo 4.

The original flow path of Drainage 1 has been heavily manipulated and connectivity no longer exists. Photo is facing east.

Photo 5.

Downstream of Drainage 1 showing the area has been heavily manipulated and altered and no longer has connectivity downstream. Photo is facing east.

Photo 6.

Upstream of Drainage 2 flowing through a rural residential area and through a manmade culvert. Photo is facing west.

Photo 7.

Drainage 2 flows in an easterly direction. Bed and banks are composed of disturbed and ruderal vegetation. Photo is facing west.

Photo 8.

Drainage 2 turns into subsurface flow halfway through the property and eventually connects to a channelized surface flow near the eastern portion of the property. Photo is facing east.

Photo 9.

Drainage 2 then flows under the road through a culvert and continues to flow southeast until it terminates within the residential area. Photo is facing east.

	**Photo 10.** A large erosional feature is located north of Drainage 2 near the eastern boundary of the Project. This feature does not connect to Drainage 2. Photo is facing northeast.
	**Photo 11.** Riparian area located in the northwest corner of the property where Drainage 2 is located. No connectivity exists from this area to Drainage 2. Photo is facing north.
	**Photo 12.** Riparian area near Drainage 2. The area is composed of Disturbed Black Willow – Red Willow Thicket and is dominated by non-native giant reed. Photo is facing northwest.

Photo 13.

Northeast portion of the riparian area near Drainage 2. Photo is facing west.

Photo 14.

Location of the soil pit sample for the riparian area near Drainage 2. The sample area was composed of a willow and giant reed patch. Photo is facing southwest.

Photo 15.

Drainage 3 receives secondary flow from a large swale on the west side of Theda Street (outside Project) that flows through a concrete culvert that flows in a southeast direction under Theda Street. Photo is facing southwest.

	**Photo 16.** Photo showing the swale located on the west side of Theda Street. This area receives flow from road run-off and from the residential homes across the street to the west. Photo is facing southwest.
	**Photo 17.** Drainage 3 primarily receives flow from road run-off from Theda Street, which turns to sheet flow before channelizing downstream into Drainage 3. Photo facing south.
	**Photo 18.** Small riparian area located northwest of Drainage 3 (outside and adjacent to Project boundary), composed of Black Willow – Red Willow Thickets. Photo is facing northwest.

	**Photo 19.** Riparian area is located near Drainage 3. This feature flows southeast before turning subsurface and eventually connects to Drainage 3. Photo is facing southeast.
	**Photo 20.** Drainage 3 once it forms channelization, flows in a southeast direction towards SR-74. Photo is facing southeast.
	**Photo 21.** Drainage 3 flows through a concrete culvert under SR-74. Photo is facing southeast.

	**Photo 22.** Drainage 3 exits under SR-74 at the southern end of the Project. The concrete apron and rip rap will be replaced in kind. Surface water flows through two CMPs and into a residential neighborhood southeast of the site before terminating within private property. There is no connectivity to any downstream features. Photo is facing west.

APPENDIX D

THIS REPORT HAS BEEN WIDTHELD TO PROTECT SENSITIVE INFORMATION

FOR REVIEW OF THIS ARCHEOLOGICAL REPORT PLEASE CONTACT:

Riverside County Flood Control and Water

Conservation District 1995 Market Street

Riverside, CA 92501

Attn: Environmental Regulatory Services III

Environmental Project Manager

Jason Swenson: 951.955.8082

jdswenso@rivco.org

-OR-

Associate Flood Control Planner

Sean Berriman: 951.955.1242

sberrima@rivco.org

APPENDIX E

PALEONTOLOGICAL SURVEY REPORT

FOR

GOOD HOPE–OLIVE AVENUE STORM DRAIN, STAGES 1 AND 2

PROJECT NO. 4-0-00425

GOOD HOPE, RIVERSIDE COUNTY, CALIFORNIA

Prepared for:

RIVERSIDE COUNTY
Flood Control and Water Conservation District
1995 Market Street
Riverside, California 92501

Prepared by:

CHAMBERS GROUP, INC.
5 Hutton Centre Drive, Suite 750
Santa Ana, California 92707
(949) 261-5414

December 30, 2022

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF PHOTOGRAPHS

SECTION 1.0 – INTRODUCTION

Chambers Group, Inc. (Chambers Group) has been contracted by Riverside County Flood Control and Water Conservation District (RCFC&WCD, or District), within Riverside County, California, to complete a paleontological survey for the proposed Good Hope – Olive Avenue Storm Drain, Stages 1 and 2 Project (Project).

Chambers Group utilized a previously conducted records search requested from the Western Science Center as part of the Paleontological Literature Review process prior to site survey of the 27-acre Project location. This report outlines the Paleontological findings.

The following study has been conducted in accordance with the California Environmental Quality Act (CEQA), and all identified cultural resources have been evaluated for eligibility on the California Register of Historical Resources and the National Register of Historical Places. This report includes appropriate mitigation measures to ensure less than significant impacts to inadvertent findings of cultural resources during construction.

SECTION 2.0 – PROJECT DESCRIPTION AND LOCATION

2.1 PROJECT DESCRIPTION

The proposed Project is located in the unincorporated community of Good Hope in Riverside County. The Good Hope area currently has very little flood control infrastructure. Flooding in residential areas occurs during periods of heavy rain. Notable flooding during storms in 2015 and 2017 led to community members petitioning the District for flood control improvements. In response to the community's needs, the District proposes to improve drainage in the area.

The proposed Project consists of the construction, operation, and maintenance of approximately 12,500 feet (ft) of storm drains ranging in diameter from 18"–84", a detention basin, three (3) inlet structures, multiple catch basins, an outlet structure, energy dissipators, and potential slope stabilization measures in the Riverside County community of Good Hope. Storm drains are proposed in the rights-of-way (ROWs) of existing roads, providing 100-year flood protection to the properties between Quail Drive and Spring Street, and properties east of Spring Street and west of Theda Street between Olive Avenue and Eucalyptus Avenue. The District has also partnered with Riverside County Transportation Department (RCTD) to provide street improvements at the same time as the installation of the underground facilities. Collectively, these improvements will safely convey stormwater flows to the existing box culvert located near the intersection of State Route (SR-) 74 and Theda Street, thereby eliminating significant surface drainage from meandering through existing residential properties during large storm events.

The Project will construct three (3) inlet structures at the northwest corner of Read Street and Mountain Avenue, the northwest corner of Olympia Avenue and Read Street, and northwest of Eucalyptus Avenue and Quail Road to collect storm flows within the community and convey them to a detention basin at the northwest corner of Spring Street and Olive Avenue, which will then drain to the existing culvert and cross SR-74. The Project will repair and replace the existing outlet structure and riprap located southeast side of SR-74.

The Project area is generally bounded by Mountain Avenue to the north, Eucalyptus Avenue to the south, Read Street to the west, Theda Street to the east, and State Route (SR-) 74 to the southeast. The Project area includes Assessor Parcel Numbers (APNs) 343-20-1002, 343-10-0006, 343-18-0009, 343-23-0001, 345-08-0070, 345-08-0071, 345-08-0072, 345-08-0068, and 345-08-0067. The Project is located the U.S. Geological Survey (USGS) Steele Peak, California 7.5-minute topographic quadrangle. The Project area is located just west of SR- 74 and is surrounded by rural residential homes and open fields. The elevation at the Project area ranges from 1,560 to 1,605 feet above mean sea level (amsl).

2.2 PROJECT LOCATION

The Project area is generally bounded by Mountain Avenue to the north, Eucalyptus Avenue to the south, Read Street to the west, Theda Street to the east, and State Route (SR-) 74 to the southeast (Figure 1). The Project area includes Assessor Parcel Numbers (APNs) 343-20-1002, 343-10-0006, 343-18-0009, 343-23-0001, 345-08-0070, 345-08-0071, 345-08-0072, 345-08-0068, and 345-08-0067. The Project is located the U.S. Geological Survey (USGS) Steele Peak, California 7.5-minute topographic quadrangle. The Project area is located just west of SR- 74 and is surrounded by rural residential homes and open fields. The elevation at the Project area ranges from 1,560 to 1,605 feet above mean sea level (amsl).

SECTION 3.0 – REGULATORY SETTING

The California Environmental Quality Act is the overriding environmental document that sets the requirement for protecting California's cultural and paleontological resources. While CEQA does not specifically establish rules that must be followed, it does require governing permitting agencies (lead agencies) to set their own guidelines for the protection of nonrenewable paleontological resources under their jurisdiction. In addition, several federal laws often are applicable when a nexus is made between a non-federal project or entity and a required federal permit, block grant or other monies, or oversite is involved.

3.1 FEDERAL

3.1.1 Federal Antiquities Act

The federal Antiquities Act of 1906 was enacted with the primary goal of protecting cultural resources in the United States. As such, it explicitly prohibits appropriation, excavation, injury, and destruction of "any historic or prehistoric ruin or monument, or any object of antiquity" located on lands owned or controlled by the federal government without permission of the Secretary of the federal department with jurisdiction. It also establishes criminal penalties, including fines and/or imprisonment, for these acts. Neither the Antiquities Act itself nor its implementing regulations (Title 43, Code of Federal Regulations [CFR] Part 3) specifically mentions paleontological resources. However, several federal agencies – including the National Park Service, the Bureau of Land Management, and the U.S. Forest Service – have interpreted objects of antiquity as including fossils. Consequently, the Antiquities Act also represents an early cornerstone for efforts to protect the nation's paleontological resources.

3.1.2 Paleontological Resources Preservation Act

The federal Paleontological Resources Preservation Act of 2009 (PRPA) (16 United States Code [U.S.C.] 470aaa et seq.) was specifically intended to codify the generally accepted practice of limiting collection on public (federal) land of vertebrate fossils and other rare and scientifically significant fossils to qualified researchers who obtain a permit from the appropriate state or federal agency and agree to donate any materials recovered to recognized public institutions where they will remain accessible to the public and to other researchers.

3.1.3 Actions by the U.S. Army Corps of Engineers

Appendix C of Title 33 CFR Section 325 establishes procedures to be followed by the U.S. Army Corps of Engineers (ACOE) to fulfill the requirements of the National Historic Preservation Act (NHPA), as well as other applicable historic preservation laws and Presidential directives related to historic resources potentially affected by ACOE actions (including issuance of permits pursuant to the federal Clean Water Act [CWA]). It specifies that when a project's authorization requires a federal action (for example, issuance of permit pursuant to Section 404 of the CWA), the project must comply with the requirements of Section 106 of the NHPA.

3.2 STATE OF CALIFORNIA

Under Guidelines for the Implementation of CEQA, as amended (California Code of Regulations [CCR] Title 14, Division 6, Chapter 3, Sections 15000 et seq.), procedures define the types of activities, persons, and public agencies required to comply with CEQA. Section 15063 of the CCR provides a process by which a lead agency may review a project's potential impact to the environment, whether the impacts are significant, and provide recommendations, if necessary. In the Environmental Checklist, one of the questions to answer is, "Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?" (Appendix G, Section V, Part c). California Public Resources Code Section 5097.5 states:

> A) No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, rock art, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.
>
> B) As used in this section, "public lands" means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.

3.3 COUNTY OF RIVERSIDE

An interactive paleontological sensitivity mapping database is available online and maintained by the County of Riverside as a research tool to access the County's assignment of paleontological sensitivity levels for the various geologic formations within the county (County of Riverside 2022).

Riverside County's "SABER Policy" (Safeguard Artifacts Being Excavated in Riverside County), enacted in October 2011 by the Riverside County Board of Supervisors, may be applicable to the current project. The "SABER Policy" requires that any paleontological resources found or unearthed in the county of Riverside be curated at a facility within Riverside County, including the Western Science Center located in the city of Hemet (County of Riverside 2015, Policy OS 19.9).

SECTION 4.0 – GEOLOGIC SETTING

4.1 GEOLOGY

The proposed Project area is located in the community of Good Hope, within western Riverside County, and is depicted on the USGS *Steele Peak* 7.5-minute topographic quadrangle. The *Steele Peak* quadrangle is located in the northern part of the Peninsular Ranges Province within the central part of the Perris block, a relatively stable, rectangular area located between the Elsinore and San Jacinto fault zones.

The region is underlain by alluvium, and Cretaceous and older basement rocks (Figure 2). Cretaceous plutonic rocks are part of the composite Peninsular Ranges batholith. A wide variety of mafic to intermediate composition granitic rocks occurs in the area, mainly of tonalitic composition but ranging from monzogranite to gabbro (Figure 2). Most rock units are faintly to intensely foliated, compositionally heterogenous, and contain varying amounts of meso-and melanocratic discoidal-shaped inclusions. Some rocks are composed almost wholly of inclusion material, and some are migmatitic. Included within these granitic rocks are septa not shown on the geologic map of Paleozoic schist of upper amphibolite metamorphic grade (Morton 1991).

Due to the plate tectonics of California, fault lines follow a northerly trend, and mountain ranges (such as those of the Peninsular Mountain Ranges in Southern California) normally follow this trend with some slight variance heading northwest. The Peninsular Ranges bordering the Upper Santa Ana Valley to the southwest and southeast are divided into three major, fault-bounded blocks. These ranges include the Santa Ana Mountains, Perris Mountains, and the San Jacinto Mountains. The Santa Ana Mountains, which lie southwest of Corona, divide the San Bernardino quadrangle and the surrounding inland area from the coast. The San Jacinto Mountains lie southeast of the *San Bernardino* and *Santa Ana* quadrangles and narrow to the northwest toward the convergence of the San Andreas and San Jacinto fault zones in the Cajon Pass slightly north of San Bernardino. The Perris Mountains lie between the San Jacinto and Elsinore-Chico fault zones, bounded on the north by the San Gabriel Fault (Morton et al. 2006:11, 17, 73; Anderson et al. 2004:2-3).

As shown on Figure 2, the proposed alignment is underlain by a variety of geologic structures including old fan deposits (Qof), very old alluvial fan deposits (Qvof), Cretaceous and Pre-Cretaceous metamorphic materials (pKm), and granitic bedrock (gr). These geologic units are briefly described below in increasing geologic age (Leighton 2020).

4.1.1 <u>Geologic Units</u>

Topsoil/Old Alluvium

As indicated on Figure 2, old alluvial fan deposits are expected along most of the alignment. These sedimentary units are moderately consolidated and slightly to moderately dissected. Older surficial deposits have upper surfaces that are capped by moderately to well-developed pedogenic soils as much as 1 to 2 meters thick (Leighton 2020; Morton et al. 2002). Old alluvial fan deposits (late to middle Pleistocene) typically comprise indurated, sandy alluvial fan deposits and locally contain matrix supported gravel. Some areas include thin, discontinuous surface layers of Holocene alluvial fan material (Morton et al. 2002).

Very Old Alluvium

The older alluvial fan deposits are anticipated to be encountered in the northwestern portion of the alignment. Very old alluvial fan deposits (early Pleistocene) are mostly well-dissected and well-indurated, and commonly contain duripans and locally silcretes (Leighton 2020; Morton et al. 2002).

Cretaceous Metamorphic Formation

Cretaceous Metamorphic Formation will be encountered at varying depth mainly along the far east portion of the alignment and is expected to be highly weathered. Lower metamorphic-grade rocks typically consist of andalusite- biotite schist, while higher metamorphic-grade rocks include cordierite biotite schist, and highest metamorphic-grade rocks form sillimanite schist and less commonly garnet bearing schist (Leighton 2020; Morton et al. 2002).

Granitic Bedrock

Granitic bedrock will be encountered at varying depth throughout the proposed alignment. This overall granitic rock unit in this area is relatively uniform, massive granodiorite grading into tonalite. This granitic bedrock will vary in hardness and density depending on depth (Leighton 2020).

SECTION 5.0 – PALEONTOLOGICAL SENSITIVITY

5.1 COUNTY OF RIVERSIDE SENSITIVITY

Low Potential

In lands for which previous field surveys and documentation demonstrate as having a low potential for containing significant paleontological resources subject to adverse impacts. The mapping of low potential was determined based on actual documentation and was not generalized to cover all areas of a particular rock unit on a geologic map.

It must be noted that surface geology, such as soils, are not always indicative of subsurface geology or the potential for paleontological resources. For instance, an area mapped as soil type “Qal” may actually be a thin surficial layer of non-fossiliferous sediments which covers fossil-rich Pleistocene sediments. Also, an area mapped as granite may be covered by a Pleistocene soil horizon that contains fossils. Thus, actual sensitivity must be ultimately determined by both a records search and a field inspection by a paleontologist.

Undetermined Potential

Areas underlain by sedimentary rocks for which literature or unpublished studies are not available have undetermined potential for containing significant paleontological resources. These areas need to be inspected by a qualified vertebrate paleontologist before a specific determination of high potential or low potential can be assigned.

High Potential

Sedimentary rock units with high potential for containing significant non-renewable paleontological resources include rock units in which vertebrate or significant invertebrate fossils have been found or determined likely to be present. These units include, but are not limited to, sedimentary formations which contain significant non-renewable paleontological resources anywhere within their geographical extent and sedimentary rock units temporally or lithologically suitable for the preservation of fossils. High sensitivity includes not only the potential for yielding abundant vertebrate fossils, but also for production of a few significant fossils that may provide new and significant data. High sensitivity areas are mapped as either “High A” or “High B,” according to the following criteria:

High Sensitivity A

High A is based on geologic formations or mapped rock units that are known to contain or have the correct age and depositional conditions to contain significant paleontological resources. These include rocks of Silurian or Devonian age and younger that have potential to contain remains of fossil fish, Mesozoic and Cenozoic rocks that contain fossilized body elements, and trace fossils such as tracks, nests, and eggs.

High Sensitivity B

High B is a sensitivity equivalent to High A but is based on the occurrence of fossils at a specified depth below the surface. This category indicates fossils that are likely to be encountered at or below 4 feet of depth and may be impacted during construction activities.

5.2 PALEONTOLOGICAL RESOURCES RECORDS SEARCH

5.2.1 Previously Recorded Paleontological Sites

As provided by Psomas (2019), a paleontological records search was conducted by Darla Radford at the Western Science Center (WSC) on October 8, 2019. The records search did not result in any paleontological resource localities within the Project study area or the extended one-mile radius. However, hundreds of localities have been documented as part of the Diamond Valley Lake Project, approximately 13 miles to the east. This is one of the largest Late Pleistocene faunal assemblages in the southwest, with over 100,000 fossil specimens from 105 plant and animal taxa (Springer et al. 2009).

A search of the database of Late Pleistocene vertebrate localities for California (Jefferson 1991), which includes institutional records and published references, indicates that no previously recorded fossil localities have been recorded within one mile of the Project study area.

5.3 PALEONTOLOGICAL SENSITIVITY ASSESSMENT

The paleontological sensitivity criteria are based on the County of Riverside's interactive online database (County of Riverside 2022). Figure 3 shows the Project area overlain on the USGS *Steele Peak* 7.5-minute topographic map and delineates the degrees of paleontological sensitivity assigned by the County of Riverside to the geologic formations within the vicinity (Low and Undetermined) (County of Riverside 2022). The bulk of the Project area is located within a "Low" designation. Detailed interaction with the County of Riverside's interactive online database did not result in differing interpretation of this assessment. Only a portion of the Project, including the eastern extents of Olive Avenue and Club Drive, and along Theda Street between Olive Avenue and SR-74, is defined as "Undetermined."

As documented by Psomas (2019) the paleontological records search did not identify any known paleontological resources within one mile of the Project area. Riverside County has designated the Project area as low sensitivity for paleontological resources, but recommends that a more in-depth study, including a pedestrian survey, be conducted to support their assessment. While the record search of the database of Late Pleistocene vertebrate localities for California, which includes institutional records and published references, indicates that no previously recorded fossil localities have been recorded within one mile of the Project, the surface sediments at, and surrounding, the Project area consist of the same Pleistocene alluvial deposits as found at the Diamond Valley Lake Project, where several hundred fossil localities have been documented. Based on this, Psomas recommended that the Project should assess the sensitivity to paleontological resources via a pedestrian survey.

5.4 PALEONTOLOGICAL SURVEY

Chambers Group conducted archaeological and paleontological surveys within the Good Hope–Olive Avenue Project area on November 3, 2022. The primary goal of the surveys was to gather and analyze information needed to determine if the Project would impact cultural and paleontological resources. The Project area was surveyed along road margins up to residential and commercial property lines, as well as 10- to 15-meter survey intervals for undeveloped parcels or unencumbered residential areas within the Project area for proposed detention infrastructure (Figure 1). The Project area was surveyed by Eduvijes Davis-Mullens and Richard Shultz, who were equipped with a sub-meter accurate Global Positioning Systems (GPS) unit for recording spatial data and documented the survey area and all findings with a high-resolution digital camera.

Survey of the Project area did not result in the identification of any paleontological materials. The majority of the Project area sediments appeared as silty sandy loam derived from granitic basement rock, (Photograph 1, Photograph 2, Photograph 3). Along Theda Street, near the intersection with SR-74, sediments appear to be derived from metamorphosed sedimentary rock (Photograph 4). Within these areas minor exposures of bedrock were observed. No fossil material was identified within the metamorphosed sedimentary structures. A review of historical aerials indicates that much of the Project area was utilized for agricultural purposes prior to residential development (Photograph 5, Photograph 6). Based on these photographs it appears that these practices consisted of either dry farming or grove orchards. It is expected that the tilling of these areas would have disturbed and possibly exposed potential fossil materials that lay within the plow zone.

SECTION 6.0 – RECOMMENDATIONS

As noted in the paleontological records search (Psomas 2019), sediments at and surrounding the Project area consist of the same Pleistocene alluvial deposits as found at the Diamond Valley Lake Project, where several hundred fossil localities have been documented. Although no paleontological materials were identified on the surface during the survey, it is possible that conditions at the time of the survey precluded their observation. Psomas concluded that the Project "involves disturbance of native soils [that] could result in the disturbance and/or destruction of paleontological resources that may be present in Pleistocene alluvial deposits that underlie the Project." However, it is also recognized that the County of Riverside lists the area within a low sensitivity and thus a low propensity for encountering such resources.

Chambers Group recommends that a qualified paleontologist shall oversee the monitoring of the initial ground-disturbing construction activity. For the bulk of the Project the monitoring approach may include spot checking after the initial ground disturbance and associated subsurface context have been observed and assessed by a qualified paleontologist. However, Chambers Group recommends full-time monitoring for all ground disturbing in areas designated as "undefined" as indicated in Figure 3, or any areas identified as potentially significant by a qualified paleontologist after initial spot-check monitoring.

6.1 MITIGATION MONITORING AND REPORTING PROGRAM

1. If paleontological resources are discovered during earth disturbance activities, the discovery shall be cordoned off with a 50-foot radius buffer to protect the discovery from further potential damage, and a Riverside County-qualified paleontologist shall be consulted to assess the discovery. If the discovery is determined to be significant by the paleontologist, a Mitigation Monitoring and Reporting Program (MMRP) shall be initiated, which will include appropriate monitoring of earth disturbance activities.

2. Monitoring may be reduced if the potentially fossiliferous units are not present in the subsurface or, if present, are determined by qualified paleontological personnel upon exposure and examination to have a low potential to contain or yield fossil resources.

3. Paleontological monitors will be equipped to salvage fossils as they are unearthed to avoid construction delays and to remove samples of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates. The monitor must be empowered to temporarily halt or divert equipment to allow for the removal of abundant or large specimens in a timely manner.

4. Paleontological salvage during trenching and boring activities is typically from the generated spoils and does not delay the trenching or drilling activities. Fossils will be collected and placed in cardboard flats or plastic buckets and identified by field number, collector, and date collected. Notes will be taken on the map location and stratigraphy of the discovery site, and the discovery site will be photographed before it is vacated, and the fossils are removed to a safe place.

5. Particularly small invertebrate fossils typically represent multiple specimens of a limited number of organisms, and a scientifically suitable sample can be obtained from one to several five-gallon buckets of fossiliferous sediment. If it is possible to dry screen the sediment in the field, a concentrated sample may consist of one or two buckets of material. For vertebrate

fossils, the test is usually the observed presence of small pieces of bones within the sediments. If present, as many as 20 to 40 five-gallon buckets of sediment can be collected and returned to a separate facility to wet-screen the sediment. In the laboratory, individual fossils are cleaned of extraneous matrix, any breaks are repaired, and the specimen, if needed, is stabilized by soaking in an archivally approved acrylic hardener (e.g., a solution of acetone and Paraloid B-72).

6. Preparation of recovered specimens to a point of identification and permanent preservation, including screen washing sediments to recover small invertebrates and vertebrates, if necessary. Preparation of individual vertebrate fossils is often more time-consuming than accumulation of invertebrate fossils.

7. Identification and curation of specimens into a professional, accredited public museum repository with a commitment to archival conservation and permanent retrievable storage (e.g., the Western Science Center, 2345 Searl Parkway, Hemet, California 92543). The paleontological program should include a written repository agreement prior to the initiation of mitigation activities.

8. Preparation of a final monitoring and mitigation report of findings and significance, including lists of all fossils recovered and necessary maps and graphics to accurately record their original location(s). The report, when submitted to the appropriate lead agency (District), will signify satisfactory completion of the Project program to mitigate impacts to any paleontological resources.

SECTION 7.0 – FIGURES AND PHOTOGRAPHS

Figure 1: Project Location Map

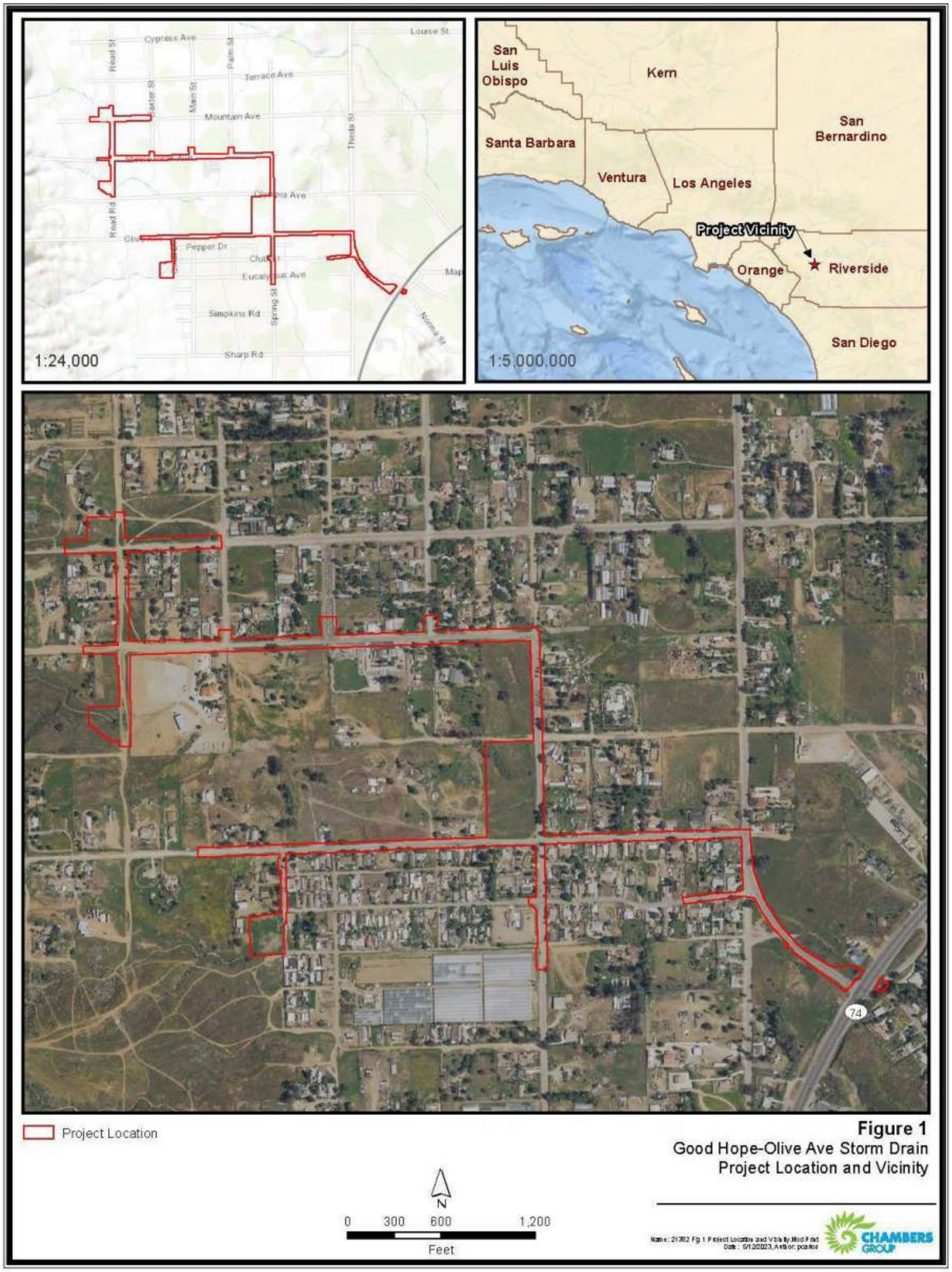


Figure 2: Regional Geology

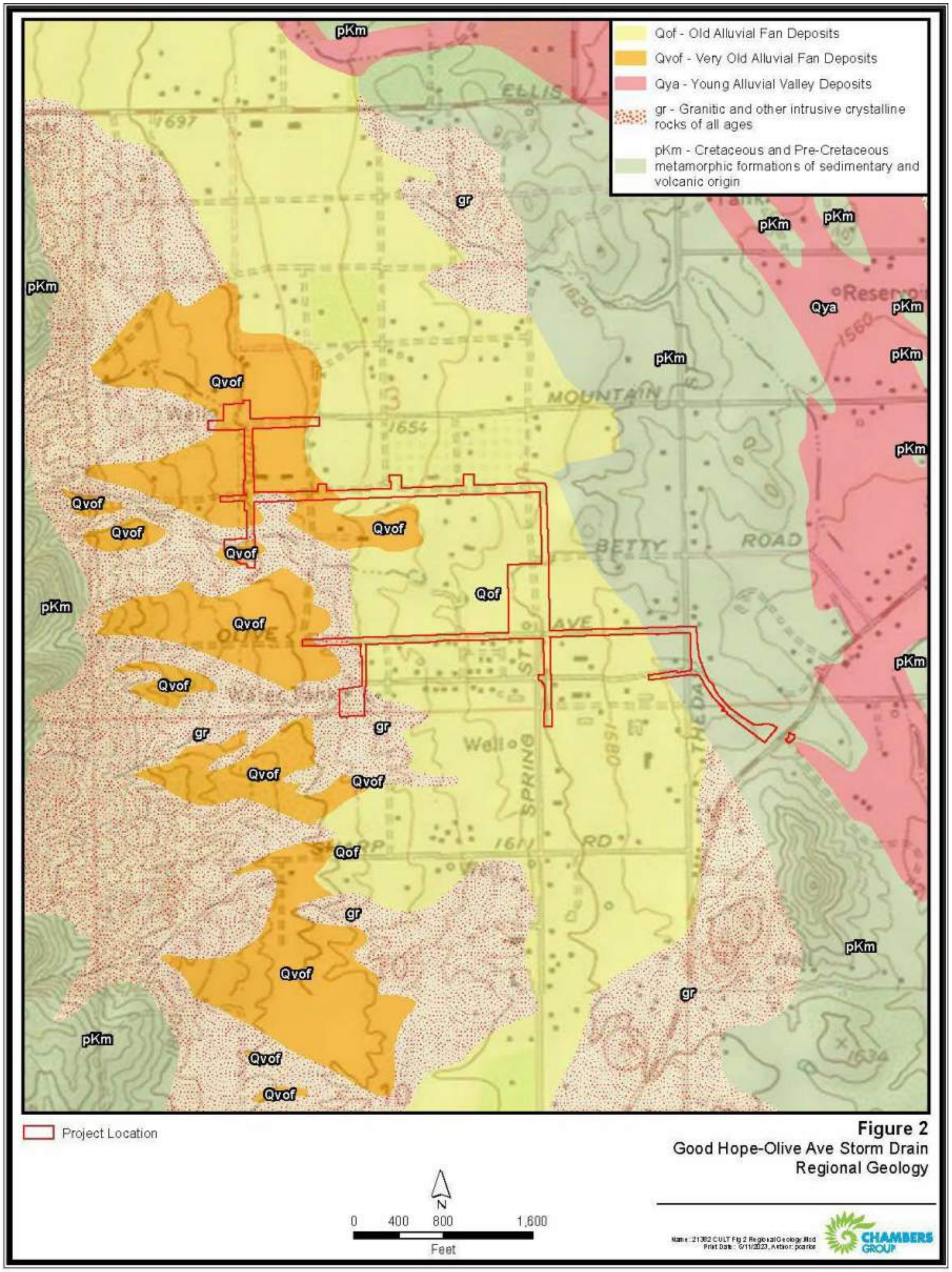
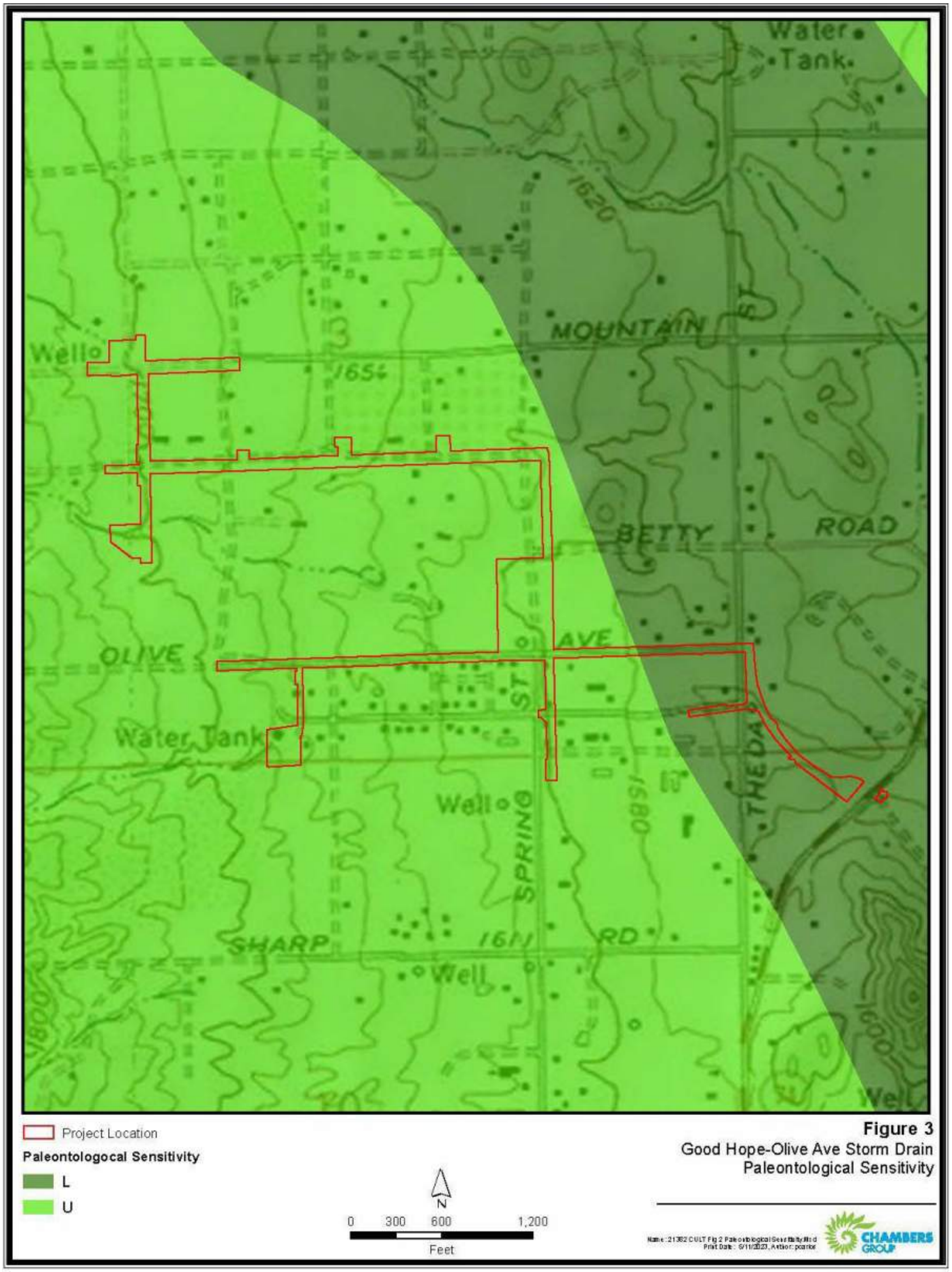


Figure 3: Paleontological Sensitivity



PHOTOGRAPHS

	Photograph 1: Sediments within Location Recorded as *Qvof*. View: South

Photograph 2: Sediments within Location Recorded as *gr*.

Photograph 3: Sediments within Location Recorded as *Qof.*
View: West

	Photograph 4: Formation within Location Recorded as *pKm.* View: West
	Photograph 5: General conditions along Mountain Avenue from Read Street. View: East

	Photograph 6: General conditions along Spring Street from near Olympia Avenue. View: South

SECTION 8.0 – REFERENCES

Anderson, M., J. Matti, and R. Jachens
2004 Structural model of the San Bernardino basin, California, from analysis of gravity, aeromagnetic, and seismicity data. *Journal of Geophysical Research: Solid Earth*, 109(B4): 2-3.

County of Riverside.
2015 Draft program EIR No. 521. State Clearinghouse No. 2009041065, Part 1 of 2. https://planning.rctlma.org/Portals/14/genplan/general_plan_2015/DEIR%20521/DEIR%20No.%20521.pdf.

2022 Map My County; Paleontological Sensitivity: https://gis.countyofriverside.us/Html5Viewer/?viewer=MMC_Public.

Jefferson, G. T.
1991 A Catalogue of Late Quaternary Vertebrates from California. *Natural History Museum of Los Angeles County, Technical Reports* 7: 1–129, updated 2006.

Leighton Consulting, Inc. (Leighton)
2020 Geophysical/Seismic Refraction Survey Good Hope – Olive Avenue Storm Drain Stages 1 and 2. Letter report prepared for Riverside County Flood Control & Water Conservation District. Riverside County, California.

Morton, Douglas M.
1991 Geologic Map of the *Steele Peak* 7.5-minute Quadrangle, Riverside County, California (No. 90-696). US Geological Survey, https://pubs.usgs.gov/of/1990/0696/report.pdf. Accessed November 6, 2018. Pp 5.

Morton, Douglas M., Rachel M. Alvarez, and Van M Diep
2002 Geologic Map of the *Steele Peak* 7.5-minute Quadrangle, Riverside County, California (OF-2001-449). US Geological Survey, https://ngmdb.usgs.gov/Prodesc/proddesc_46484.htm. Accessed November 4, 2022.

Morton, D.M., Fred K. Miller, Pamela M. Cossette, and Kelly R. Bovard
2006 Geologic Map of the *San Bernardino* and *Santa Ana* 30-minute by 60-minute Quadrangles, California. US Geological Survey. Pp 1-2. 10-11, 15-17, 73.

Psomas
2019 Cultural and Paleontological Resources Technical Memorandum. Report prepared for Riverside County Flood Control & Water Conservation District. Riverside County, California.

Springer, K.B., E. Scott, J.C. Sagebiel, and L.K. Murray.
2009 The Diamond Valley Lake local fauna: Late Pleistocene Vertebrates from Inland Southern California, in, *Papers on Geology, Vertebrate Paleontology, and Biostratigraphy in Honor of Michael O. Woodburne*, edited by L.B.I. Albright. Museum of Northern Arizona Flagstaff

APPENDIX F

GEOTECHNICAL EXPLORATION
GOOD HOPE – OLIVE AVENUE STORM DRAIN
STAGES 1 AND 2
UNINCORPORATED RIVERSIDE COUNTY CALIFORNIA
(RCFC&WCD PN 4-0-00425)

Prepared For
RCFC & WCD
1995 MARKET STREET
RIVERSIDE, CALIFORNIA 92501

Prepared By
LEIGHTON CONSULTING, INC.
41715 ENTERPRISE CIRCLE N, SUITE 103
TEMECULA, CALIFORNIA 92590

Project Number 10206.006

May 31, 2023 (*Revision 01*)

May 31, 2023
Revision 01

Project No. 10206.006

RCFC & WCD
1995 Market Street
Riverside, California 92501

Attention: Mr. Entcho Anguelov

Subject: Geotechnical Exploration
Good Hope – Olive Avenue Storm Drain Stages 1 and 2
Unincorporated Riverside County, California
(RCFC&WCD PN 4-0-00425)

In accordance with your authorization, we performed a geotechnical exploration for the subject project located in the Good Hope area of Unincorporated Riverside County, California. This report presents our findings and provides geotechnical recommendations for the design and construction of the proposed storm drain. *This report is updated/revised based on comments received from you and discussed during our telecommunications on May 18, 2023.*

Based on the results of our geotechnical exploration, the soil conditions at the site consist of surficial fill materials, alluvial deposits, and granitic bedrock. Groundwater was encountered in some of our exploratory borings as shallow as 12 feet below ground surface (BGS). The site is not located within an Alquist-Priolo or Riverside County Earthquake Fault Zone.

The opportunity to be of service is sincerely appreciated. If you should have questions, please do not hesitate to call our office.

Respectfully submitted,

LEIGHTON CONSULTING, INC.

PROFESSIONAL ENGINEER SIMON I SAIID 2641 GEOTECHNICAL STATE OF CALIFORNIA

Simon I. Saiid, GE
Senior Principal Engineer
Ext 8013 ssaiid@leightongroup.com

Robert F. Riha, CEG
Senior Principal Geologist
Ext 8914 rriha@leightongroup.com

REGISTERED GEOLOGIST ROBERT F. RIHA No. 1921 CERTIFIED ENGINEERING GEOLOGIST STATE OF CALIFORNIA

Distribution: (1) Addressee (electronic copy)

TABLE OF CONTENTS

Section | Page

LIST OF TABLES

LIST OF FIGURES AND PLATES

LIST OF APPENDICES

1.0 INTRODUCTION

1.1 Site and Project Description

The proposed storm drain system is generally located within the Good Hope Community located in an unincorporated area of Riverside County between the City of Menifee and Canyon Lake (Figure 1, Appendix A). More specifically, the project consists of an approximately 12,500 LF of RCP storm drain pipeline along with incised detention basin, inlet areas, and RCB outlet structure. As indicated on Figure 3, the pipeline alignment starts on Theda Street, near the intersection with Hwy 74, continues north to Olive Street, north and south on Spring Street, west on Steele Peak Drive, north and south again on Read Street, and a branch along Quail Drive, south of Olive Street. The proposed storm drains will vary in diameter from 18 to 84 inches and installed at approximately 8 to 12 feet below existing ground surface within existing streets right-of-way. We also understand that potential incised detention basins are located on privately owned parcels (APNs 343-220-026, -028 and 343-230-001) north of Olive Avenue along the west side of Spring Street.

1.2 Purpose and Scope of Evaluation

The purpose of our evaluation is to (1) evaluate geotechnical engineering characteristics of the soil at the project site (2) evaluate the rippability characteristics of the underlying granitic bedrock to help the District in the selection process for the most suitable alignment and the excavation characteristics of the subsurface materials and (3) provide geotechnical recommendations for design and construction of the proposed storm drain. As described in our proposal, the scope of our evaluation included the following tasks:

- Desktop Review: Review available in-house including our previous studies for this project, referenced at the end of this report.
- Permits: Obtained an encroachment permit from the County of Riverside to perform borings and geophysical surveys within existing street ROWs.
- Field Exploration - Borings: Our field exploration consisted of 17 borings drilled within accessible locations along the proposed alignment. Two percolation/infiltration tests were also performed within the proposed detention basin.
- Field Exploration – Seismic Refraction: This portion of the field exploration included 28 seismic refraction traverses at locations along the proposed alignment.
- Geotechnical Laboratory Tests: Geotechnical laboratory tests were performed on selected soil samples collected during our field exploration. This laboratory testing program was designed to evaluate general physical and engineering characteristics of soil along the proposed alignment.

- Engineering Analysis: Data obtained from our field exploration, and geotechnical laboratory testing program was evaluated to develop geotechnical conclusions and recommendations for the proposed basin design and construction.
- Report Preparation: Results of this evaluation have been summarized in this report, presenting our findings, conclusions and geotechnical recommendations for the proposed storm drain improvements.

This report does not address the potential for encountering hazardous materials. Important information about limitations of geotechnical reports, in general, is presented in Appendix D, *GBC Important Information about This Geotechnical Report.*

1.3 Field Exploration

Our field exploration consisted of the excavation of 17 borings in accessible areas along the proposed pipeline alignment, and two percolation/infiltration tests performed within the proposed detention basin. Prior to excavating, we located and marked boring locations for coordination with Underground Service Alert (USA). Our field explorations were performed on March 31, 2022 and May 25, 2022, after obtaining required encroachment permits from County of Riverside and private properties. Boring LB-16 could not be completed due to conflict with existing underground utilities.

The exploratory borings were excavated utilizing a truck-mounted, CME 75 drill rig using 8-inch hollow-stem flight augers. During the drilling operations, bulk and relatively undisturbed samples were obtained from the borings for laboratory testing and evaluation. Sampling was conducted by a staff geologist from our office and samples were then transported to our laboratory for testing. Borings were backfilled with native soil and capped with cold patch asphalt. The logs of borings are presented in Appendix A. Approximate location of the borings is depicted on the Boring Location Map (Figure 3).

1.4 Laboratory Testing

Laboratory tests were performed on selected samples to provide a basis for development of geotechnical design parameters. Samples were tested to evaluate the following parameters: in-situ moisture and density, shear strength, maximum dry density and optimum moisture content, gradation (sieve analysis), and soluble sulfate content. The results of our laboratory testing and summaries of the testing procedures are presented in Appendix B.

1.5 Seismic Refraction Survey

Based on discussions with the District, a total of twenty-eight (28) seismic refraction traverses were performed at selected locations along the proposed alignment (see Figure

3 and Appendix C). This seismic P-wave (compression wave) refraction study was performed to evaluate the rippability characteristics of the subsurface materials and to develop subsurface velocity profiles. The seismic refraction method uses first-arrival times of refracted seismic waves to estimate the thicknesses and seismic velocities of subsurface layers. The resulting velocity models for each seismic line will provide a tomography image of the estimated geologic conditions. Both vertical and lateral velocity information is contained in the tomography model. Changes in layer velocity are revealed as gradients rather than discrete contacts, which typically are more representative of actual conditions. The results of these surveys are provided in a report prepared by our subconsultants Southwest Geophysics and Atlas included in Appendix C.

2.0 SUMMARY OF GEOTECHNICAL FINDINGS

A summary of our findings from research of pertinent literature, site-specific field exploration, geotechnical laboratory testing and engineering analysis, is discussed in this section.

2.1 Overall Site Geology

As shown on the Regional Geology Map (Figure 2), the subject site is primarily located within Quaternary-age alluvial fan deposits (Qof) underlain by granitic bedrock at depth. The site-specific geology/ subsurface conditions are discussed in Section 2.2 below. Detailed descriptions of the geologic units encountered in each excavation are provided in Appendix A.

2.2 Subsurface Conditions

Based on the results of our geotechnical exploration, the alignment of the proposed storm drain is underlain by the following:

- ***Existing Pavement:*** Portions of the alignment is within paved streets. Where encountered, the pavement section at the locations of our borings are included in Table 1 below.

Table 1. Pavement Thickness

Boring/Location	Asphalt (Inches)	Aggregate Base (Inches)
LB-3 (Olive Street)	3	7
LB-10 (Spring Street)	3	6

- ***Undocumented Fill***: Undocumented fill up to 5.5 feet below existing surface elevations was encountered during our exploration within the existing roadways (LB-12). The undocumented fill soils consist primarily of moist silty sand. The undocumented fill appears to be locally derived and possess grain size distribution similar to that of the alluvium.
- ***Quaternary-age Alluvium:*** These alluvial deposits were encountered in each of our geotechnical borings below the undocumented fill to a depth of 2 to 10 feet BGS. The sampled alluvium consisted generally of moist, loose to medium dense, silty sand (SM) and clayey sand (SC). In-situ density and moisture contents of the alluvium encountered in our soil borings are presented on the soil boring logs, in Appendix A. Alluvium is expected to generally possess very low expansion (EI<21) and very slight collapse potential.

- ***Granitic Bedrock***: Bedrock was encountered below the artificial fill and alluvial deposits in all borings to the depth explored. This overall granitic rock unit is relatively uniform, massive granodiorite grading into tonalite. The bedrock will vary in hardness and density depending on depth. As encountered, the bedrock is highly weathered within the depth explored and excavates to silty sand and well graded sand with varying amounts of gravel.

2.3 Excavation Characteristics

Based on our exploration and the seismic refraction survey (Appendix C) the encountered bedrock is expected to be generally excavatable within the upper 10 to 15 feet BGS. Scattered resistant, non-weathered core stones should be anticipated within shallow depth or upper 10 feet in some locations, especially in western portions of site. Grading and/or trench excavation characteristics using conventional excavators or earthmoving equipment may vary based on the specific equipment used. It is important that a contractor with excavation experience in similar conditions should be consulted for the proper excavation method, equipment, and production rate. Caving of excavations in the non-cohesive sands should be anticipated. This is discussed further in Section 3.2 and Appendix C.

2.4 Surface and Groundwater

No surface water was observed at the time of our field exploration. Groundwater was encountered at depths of approximately 12 feet in LB-3, 19.5 feet in LB-5, and 13 feet in LB-7.

2.5 Faulting and Seismicity

The subject site, like the rest of Southern California, is located within a seismically active region as a result of being located near the active margin between the North American and Pacific tectonic plates. The principal source of seismic activity on this site is movement along the northwest-trending regional fault systems such as the San Andreas and San Jacinto. There are no known active faults traversing the pipeline alignment.

For the purpose of structural design, seismic coefficients based on the 2022 California Building Code (CBC) are provided in Table 2 below.

Table 2. Site Categorization and Seismic Coefficients

CBC Categorization/Coefficient	USGS site parameters
Site Longitude (decimal degrees)	33.75987
Site Latitude (decimal degrees)	-117.28051
Site Class Definition	C
Mapped Spectral Response Acceleration at 0.2s Period, S_s	1.50 g
Mapped Spectral Response Acceleration at 1s Period, S_1	0.56 g
Short Period Site Coefficient at 0.2s Period, F_a	1.20
Long Period Site Coefficient at 1s Period, F_v	1.44
Adjusted Spectral Response Acceleration at 0.2s Period, S_{MS}	1.80 g
Adjusted Spectral Response Acceleration at 1s Period, S_{M1}	0.80 g
Design Spectral Response Acceleration at 0.2s Period, S_{DS}	1.20 g
Design Spectral Response Acceleration at 1s Period, S_{D1}	0.54 g

2.6 Liquefaction Potential

Liquefaction is the loss of soil strength due to a buildup of pore-water pressure during severe ground shaking. Liquefaction is associated primarily with loose (low density), saturated, fine- to medium-grained, cohesionless soil. Due to the dense nature of the underlying bedrock, liquefaction potential is considered very low.

2.7 Percolation/Infiltration Testing

Two (2) preliminary percolation tests were performed in proposed infiltration basin located northwest of Olive Avenue and Spring Street (see Figure 3) in general accordance with the procedures of the Riverside County Flood Control and Water Conservation District (RCFC&WCD) Design Handbook (RCFC, 2018). Percolation tests were performed at a depth of approximately 10 feet BGS. The test results indicate relatively low percolation rates in the younger alluvial soils and much higher rates in the weathered bedrock at locations tested. The actual test results/data sheets are included in Appendix A. The converted infiltration rates are presented in Table 3 below, in units of inches per hour (in/hr). The measured rates are defined as “unfactored” in that no safety factor has been applied.

Table 3. Field Percolation Testing Summary

Percolation Test ID	Percolation Test Method	Approx. Depth BGS (feet)	Infiltration Rate (in/hr)	Soil Description
P-1	Falling Head	10	8.66	Weathered granitic bedrock
P-2	Falling Head	10	0.46	Alluvium (SM/SC)

3.0 CONCLUSIONS AND RECOMMENDATIONS

3.1 General

Construction of the proposed storm drain pipeline and associated improvements are feasible from a geotechnical viewpoint provided that the following recommendations are incorporated into the design and construction phases of development. The encountered fill and alluvium should be considered CalOSHA Type C soil, and sloped excavations will be required to protect workers in the excavations, if shoring and/or shields are not used. Geotechnical recommendations for design and construction of the proposed pipelines are presented below.

3.2 Earthwork Considerations

Earthwork associated with the proposed pipeline should be performed in accordance with applicable RCFC&WCD/District Specifications, “Standard Specifications for Public Works Construction” (Green Book, latest edition) and the recommendations included in the text of this report.

3.2.1. Trench Excavation

Based on the results of our exploratory borings and the geophysical refraction survey, the onsite alluvium (upper 5 to 15 feet) should generally be easy to excavate with conventional earthmoving excavation equipment, such as Cat 235 trackhoe. However, the degree of trenching difficulty shall be evaluated by the contractor based on means-and-methods or capabilities of contractor’s excavation equipment.

Excavation/rippability characteristics of underlying granitic rock is further discussed in Appendix A. Weathered rock with less than 4,000 ft/sec P-wave velocities are typically classified as moderate/rippable if excavated by Caterpillar D-9 dozer with a single shank (see Table 4 below). This classification is based on published information from the Caterpillar Performance Handbook (Caterpillar, 2018). Although no similar correlations are published for typical trench excavation equipment, a cut-off velocity of ±3,500 ft/sec may be used as a basis for non-rippable trenching using Cat 235 trackhoe (hydraulic excavator with rock ripper/bucket).

Table 4. Rippability Classification

Seismic P-wave Velocity	Rippability
0 to 2,000 feet/second	Easy
2,000 to 4,000 feet/second	Moderate
4,000 to 5,500 feet/second	Difficult, Possible Blasting
5,500 to 7,000 feet/second	Very Difficult, Probable Blasting
Greater than 7,000 feet/second	Blasting Generally Required

Localized high velocities (>4000 feet/second) exist within the upper 10 feet, which indicate the presence of less weathered bedrock, and buried corestones/remnant boulders. Accordingly, contractors should make their own evaluation of rock rippability/excavation prior to submitting their bids based on the seismic P-wave velocities including in Appendix A, and the equipment to be used.

Excavation should be performed in accordance with the project plans, specifications, and applicable OSHA requirements. The contractor should be responsible for providing the "competent person" required by OSHA standards. Contractors should be advised that sandy soil (such as existing, onsite fill and alluvium) could make excavations particularly unsafe, and hence necessary safety precautions should be taken.

3.2.2. Subgrade Preparation

Medium dense to dense silty to clayey sand are expected below the bottom of the proposed storm drain pipeline (5 to 10 feet bgs). The exposed grade should be suitable for pipe subgrade. However, depending on actual field conditions encountered during construction, localized over-excavation (OX) may be required if dense granitic rock is encountered to transition from bedrock to alluvial soils. A 2-foot OX will be require in the granitic rock side of subgrade for a distance of 10 feet or at least length of pipe segment. Any resulting voids in rock excavation should be properly backfilled with suitable soil.

3.2.3. Fill and Backfill

The onsite undocumented fill and alluvium within the proposed excavation depths are generally suitable as fill soil provided they are relatively free of rocks over 6 inches in diameter and organic matter. Backfill materials should be placed in thin lifts, moisture conditioned, as necessary, and mechanically compacted using a minimum standard of 90 percent relative compaction, relative to the ASTM D 1557 laboratory maximum dry density or as required per District standard specifications.

3.3 Recommended Soil Parameters

3.3.1. Soil Erodibility Factor (K)

Based on the results of our laboratory testing (grain size analysis), the Soil Erodibility Factor (K) is expected to range from 0.35 to 0.55 per the Erickson/USDA nomograph. These values are applicable to the on-site alluvium and locally derived fill soil.

3.3.2. Rankine's Factor (K)

Based on the results of our laboratory testing (shear strength), a Rankine's ratio of active lateral pressure to vertical unit pressure (K) of 0.33 may be used for pipe D-Load calculations. This value is applicable to the on-site alluvium and locally derived fill soil.

3.3.3. Sliding Friction (μ')

Based on the results of our laboratory testing (shear strength), a coefficient of sliding friction (μ'), between backfill soil and trench walls of 0.55 may be used for pipe D-Load calculations. This value is applicable to the on-site alluvium and locally derived fill soil.

3.4 Lateral Earth Pressures

3.4.1. Lateral Pressure

Soil's resistance ability to withstand lateral loads on a shallow foundation is a function of the frictional resistance along the base of the footing and the passive resistance that may develop as the face of the structure tends to move into the soil. The frictional resistance between the base of the concrete and the subgrade soil may be computed using a coefficient of friction of 0.35. The passive resistance may be computed using an equivalent fluid pressure of 300 pounds-per-cubic-foot (pcf), assuming there is constant contact between concrete and undisturbed soil. These friction and passive values have already been reduced by a factor-of-safety of 1.5, and can be increased by one-third when considering short-duration wind or seismic loads.

3.4.2. Soil Parameters for Pipe Design

Structural design of pipes requires proper evaluation of possible loads acting on the pipe, including dead and live or transient loads. Stresses and strains induced in a buried pipe depend on many factors, including the type of pipe, depth and width of trench, bedding and embedment conditions, soil density, angle of internal friction, coefficient of passive earth pressure, and coefficient of friction at the interface between the backfill and in-situ soil. We recommend the following soil parameters for the proposed concrete pipe design shown in Table 5 below:

Table 5. Soil Parameters for Pipe Design

Soil Parameters	Recommended Values
Average Compacted fill moist unit weight, (pcf)	125-135
Angle of internal friction of soil (degrees)	34
Soil cohesion, c (psf)	0
Sliding friction between concrete pipe and native soil	0.40
Coefficient of active earth pressure/Rankine, Ka	0.33
Coefficient of earth pressure at rest, Ko	0.50

3.5 Corrosivity Evaluation

Sulfate ions in the soil can lower soil resistivity and can be highly aggressive to Portland cement concrete by combining chemically with certain constituents of the concrete, principally tricalcium aluminate. This reaction is accompanied by expansion and eventual disruption of the concrete matrix. Potentially high sulfate content could also cause corrosion of the reinforcing steel in concrete. Table 6 below summarizes current standards for concrete exposed to sulfate-containing solutions.

Table 6. Sulfate Concentration and Sulfate Exposure

Sulfate In Water (parts-per-million)	Water-Soluble Sulfate (SO_4) in soil (percentage by weight)	Sulfate Exposure
0-150	0.00 - 0.10	Negligible
150-1,500	0.10 - 0.20	Moderate (Seawater)
1,500-10,000	0.20 - 2.00	Severe
>10,000	Over 2.00	Very Severe

The sulfate content was evaluated in the laboratory for representative onsite soil sample. The results indicate that the water soluble sulfate range is less than 0.1 percent by weight, which is considered negligible as per the table above. Based upon these test results, <u>no special concrete considerations are required for sulfate exposure from the onsite soil</u>.
Many factors can affect corrosion potential of soil including soil moisture content, resistivity, permeability and pH, as well as chloride and sulfate concentration. In general, soil resistivity, which is a measure of how easily electrical current flows through soil, is the most influential factor. Based on the findings of studies presented in ASTM STP 1013 titled “Effects of Soil Characteristics on Corrosion” (February, 1989), the approximate relationship between soil resistivity and soil corrosiveness was developed as shown in Table 7 below.

Table 7. Relationship between Soil Resistivity and Soil Corrosivity

Soil Resistivity (ohm-cm)	Classification of Soil Corrosiveness
0 to 900	Very Severely Corrosive
900 to 2,300	Severely Corrosive
2,300 to 5,000	Moderately Corrosive
5,000 to 10,000	Mildly Corrosive
10,000 to >100,000	Very Mildly Corrosive

Acidity is an important factor of soil corrosivity. The lower the pH (the more acidic the environment), the higher the soil corrosivity will be with respect to buried metallic structures and utilities. As soil pH increases above 7 (the neutral value), the soil is increasingly more alkaline and less corrosive to buried steel structures, due to protective surface films, which form on steel in high pH environments. The lowest pH sample obtained from the site is 7.7 which is generally considered less active from a corrosion standpoint. Chloride and sulfate ion concentrations, and pH play secondary roles in affecting corrosion potential. High chloride levels tend to reduce soil resistivity and break down otherwise protective surface deposits, which can result in corrosion of buried steel or reinforced concrete structures.

Based on minimum resistivity laboratory test result of 1,300 ohm-cm, the onsite soil is considered severely corrosive. Ferrous pipe can be protected by polyethylene bags, tape or coatings, di-electric fittings, concrete encasement or other means to separate the pipe from wet soil. If corrosion sensitive materials are intended to be used onsite, further testing of import and possibly site soil could be performed and specific recommendations for corrosion protection may need to be provided by a qualified corrosion engineer.

3.6 Temporary Cut Slopes

The contractor is responsible for temporary slopes and trenches excavated at the site and the design of required temporary shoring. Shoring, bracing and benching should be performed by the contractor in accordance with the current edition of the *California Construction Safety Orders*, see:

http://www.dir.ca.gov/title8/sb4a6.html

During construction, exposed soil conditions should be regularly evaluated to check that conditions are as anticipated. The contractor is responsible for providing the "competent person" required by OSHA standards to evaluate soil conditions. Close coordination between the competent person and geotechnical consultant should be maintained to facilitate construction while providing safe excavations. The existing alluvial soil encountered is classified as OSHA soil Type C. Unshored temporary cut slopes should be no steeper than 1½:1 (horizontal:vertical), for a height no-greater-than (≤) 20 feet (*California Construction Safety Orders*, Appendix B to Section 1541.1, Table B-1). These recommended temporary cut slopes assume a level ground surface for a distance equal to one-and-a-half (x1.5) the depth of excavation. For steeper temporary slopes, deeper excavations, and/or where slopes terrain exists within close proximity to excavation (<1.5xdepth), appropriate shoring methods or flatter slopes may be required to protect the workers in the excavation and adjacent improvements. Such methods should be implemented by the contractor and reviewed by the geotechnical consultant.

3.7 Temporary Shoring

If the sloped open cut excavation is not feasible based on requirements above and due to existing structures, excavations should be supported by a temporary shoring system such as cross-braced hydraulic shoring, conventional shields, sheet piles, or soldier piles and wood lagging. The choice should be left to the contractor's judgment since economic considerations and/or the individual contractor's construction experience may be important factors. The contractor and shoring designer should also perform additional geotechnical studies as necessary to refine the means-and-methods of shoring construction.

The support of adjacent existing structures during excavation and construction (including pavements) without distress is the contractor's responsibility. In addition, it should be the contractor's responsibility to undertake a pre-construction survey with benchmarks and photographs of the adjacent properties. Shoring systems should be designed by a California licensed civil or structural engineer. As preliminary design guidelines, we present the following geotechnical parameters for shoring design. The following lateral earth pressures are recommended for temporary shoring supporting the anticipated alignment soil types with level ground behind the shoring. Passive pressure also may be used to compute lateral soil resistance, if necessary, for sheet piles. Earth pressures provided are ultimate values and a safety factor should be applied as appropriate.

Table 8. Static Lateral Earth Pressures

Conditions[1]	Static Equivalent Fluid Weight (pcf)
Active (cantilever)	35
At-Rest (braced)	50
Passive[2]	300

1. For temporary excavations only, with level backfill, not including surcharges
2. Passive equivalent fluid pressure may be doubled for isolated soldier piles spaced at least 2½ diameters on-center. Passive resistance should not exceed 3,500 pounds-per-square-foot (psf)

Determination of appropriate design conditions (active or at-rest) depends on shoring flexibility. If a rotation of more than 0.001 radian (0.06 degrees) is allowed, active pressure conditions apply; otherwise, at-rest condition governs.

Surcharge loads (dead or live) should be added to the indicated lateral earth pressures and should be applied uniformly, if such loads are within a horizontal distance that is less-than the exposed shoring height. The corresponding lateral earth pressure will approximately be 33-percent of the vertical surcharge for active conditions, and 50-percent for at-rest conditions. Surcharge pressures from concentrated loads should be evaluated after geometric constraints and loading conditions are evaluated on individual basis.

3.8 Dewatering during Trenching and Pipeline Construction

Based on the results of our exploration, groundwater was encountered and may become a geotechnical concern during construction. If encountered during excavations, groundwater control, such as dewatering, will be required to limit instability of the excavation bottom, side and face, and aid construction and soil backfill. Groundwater due to perched saturated conditions can be dewatered utilizing sump-pumps. Dewatering or other suitable methods for stabilizing the excavation bottom may be selected by the contractor based on actual groundwater conditions encountered and based on the contractor's chosen means-and-methods of construction. The method selected by the contractor should be able to effectively mitigate for bottom heave or stabilize subgrade soil during construction and backfilling.

3.9 Additional Geotechnical Services

This report was based in part on data obtained from a limited number of observations, site visits, soil excavations, samples and tests. Such information is, by necessity, incomplete. The nature of many construction projects is such that differing soil or geologic conditions can be present within relatively small distances between borings and under varying climatic conditions. Changes in subsurface conditions can and do occur over time. Therefore, our findings, conclusions and recommendations presented in this report are only valid if Leighton Consulting, Inc. has the opportunity to observe subsurface conditions during construction, to confirm that our preliminary data are representative for the site. Geotechnical observation and testing should be provided by Leighton Consulting, Inc. during backfill and when unusual conditions are encountered.

4.0 LIMITATIONS

This report was necessarily based in part upon data obtained from a limited number of observances, site visits, soil samples, tests, analyses, histories of occurrences, spaced subsurface explorations and limited information on historical events and observations. Such information is necessarily incomplete. The nature of many sites is such that differing characteristics can be experienced within small distances and under various climatic conditions. Changes in subsurface conditions can and do occur over time. This investigation was performed with the understanding that the subject site is proposed for development as described in Section 1.1 of this report. The client is referred to Appendix C regarding important information provided by the Geoprofessional Business Association (GBA) on geotechnical engineering studies and reports and their applicability.

This report was prepared for RCFC & WCD based on RCFC & WCD needs, directions, and requirements at the time of our investigation. This report is not authorized for use by, and is not to be relied upon by any party except RCFC & WCD, and its successors and assigns as owner of the property, with whom Leighton Consulting, Inc. has contracted for the work. Use of or reliance on this report by any other party is at that party's risk. Unauthorized use of or reliance on this report constitutes an agreement to defend and indemnify Leighton Consulting, Inc. from and against any liability which may arise as a result of such use or reliance, regardless of any fault, negligence, or strict liability of Leighton Consulting, Inc.

.

REFERENCES

California Building Code (CBC), 2022, "*California Code of Regulations*," Title 24, Part 2, Vol. 2.

California, Division of Mines and Geology (CDMG), 1980, *Special Study Zones, San Jacinto Quadrangle, Revised Official Map,* Effective January 1, 1980.

Dibblee, T.W., and Minch. J.A., 2003, Geologic Map of the Steele Peak quadrangle, Riverside County, California, Dibblee Geological Foundation, Dibblee Foundation Map DF-111.

Hart, E.W., Bryant, W.A., 2007, Fault-Rupture Hazard Zones in California, Alquist-Priolo Earthquake Fault Zoning Act with Index to Earthquake Zones Maps, Department of Conservation, California Geological Survey, Special Publication 42, 2007 Interim Revision.

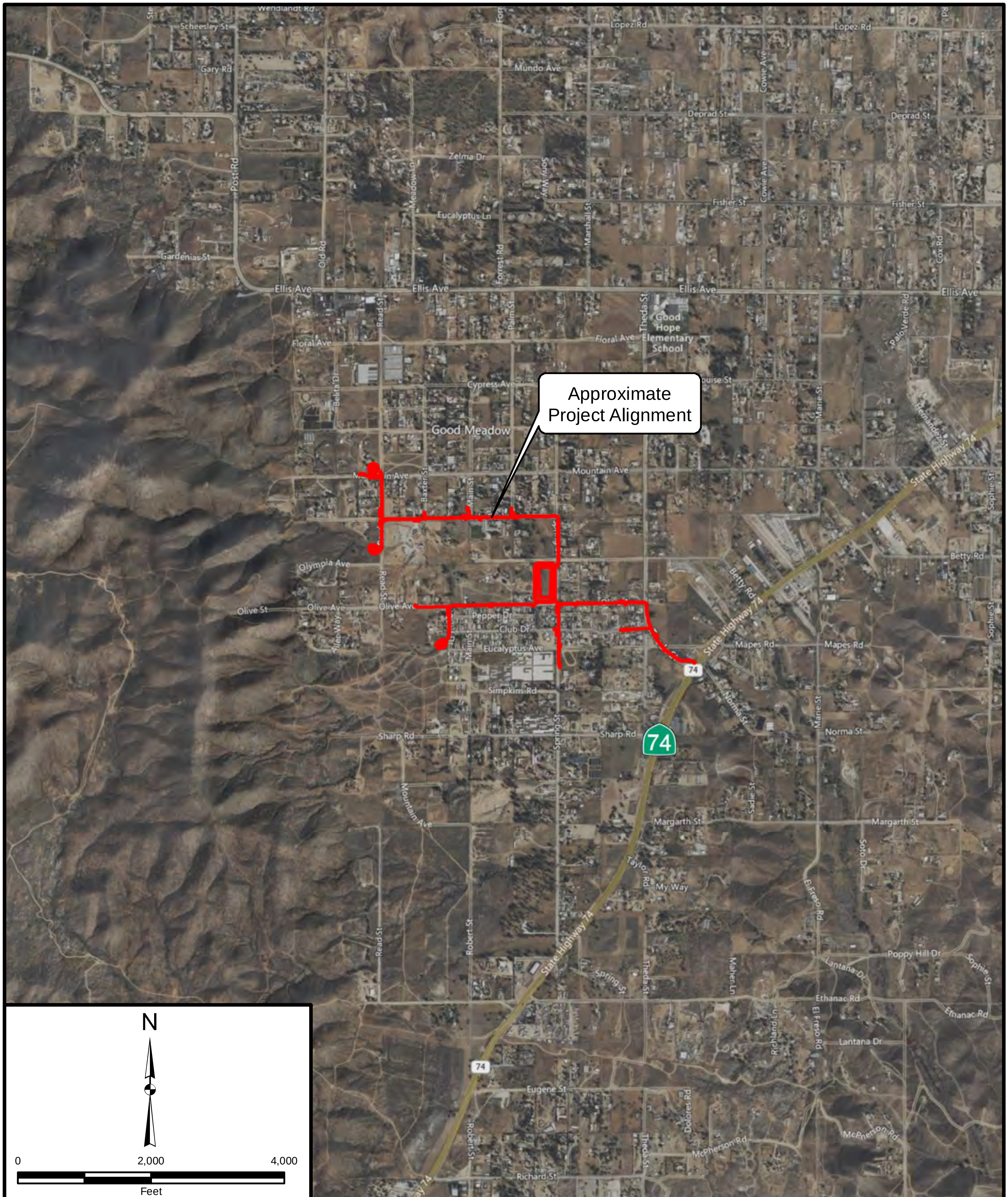
Morton, D.M., Alvarez, R.M., and Diep, V.M., 2002, Geologic map of the Steele Peak 7.5' quadrangle, Riverside County, California, U.S. Geological Survey, Open-File Report OF-2001-449.

National Center for Earthquake Engineering Research, (NCEER), 1997, Proceedings of the NCEER Workshop of Liquefaction Resistance of Soils, Technical Report NCEER-97-0022, dated December 31.

OSHPD, 2023, Seismic Design Maps, on OSHPD Website to Calculate Seismic Response and Design Parameters based on ASCE 7-16 Seismic Procedures, https://seismicmaps.org/

Public Works Standard, Inc., 2021, Greenbook, *Standard Specifications for Public Works Construction*: BNI Building News, Anaheim, California.

USDA, 2018, United States Department of Agriculture National Resources Conservation Services Web Site.



Project: 10206.006	Eng/Geol: SIS/RFR
Scale: 1 " = 2,000 '	Date: March 2023
Base Map: ESRI ArcGIS Online 2023	
Author: (mmurphy)	

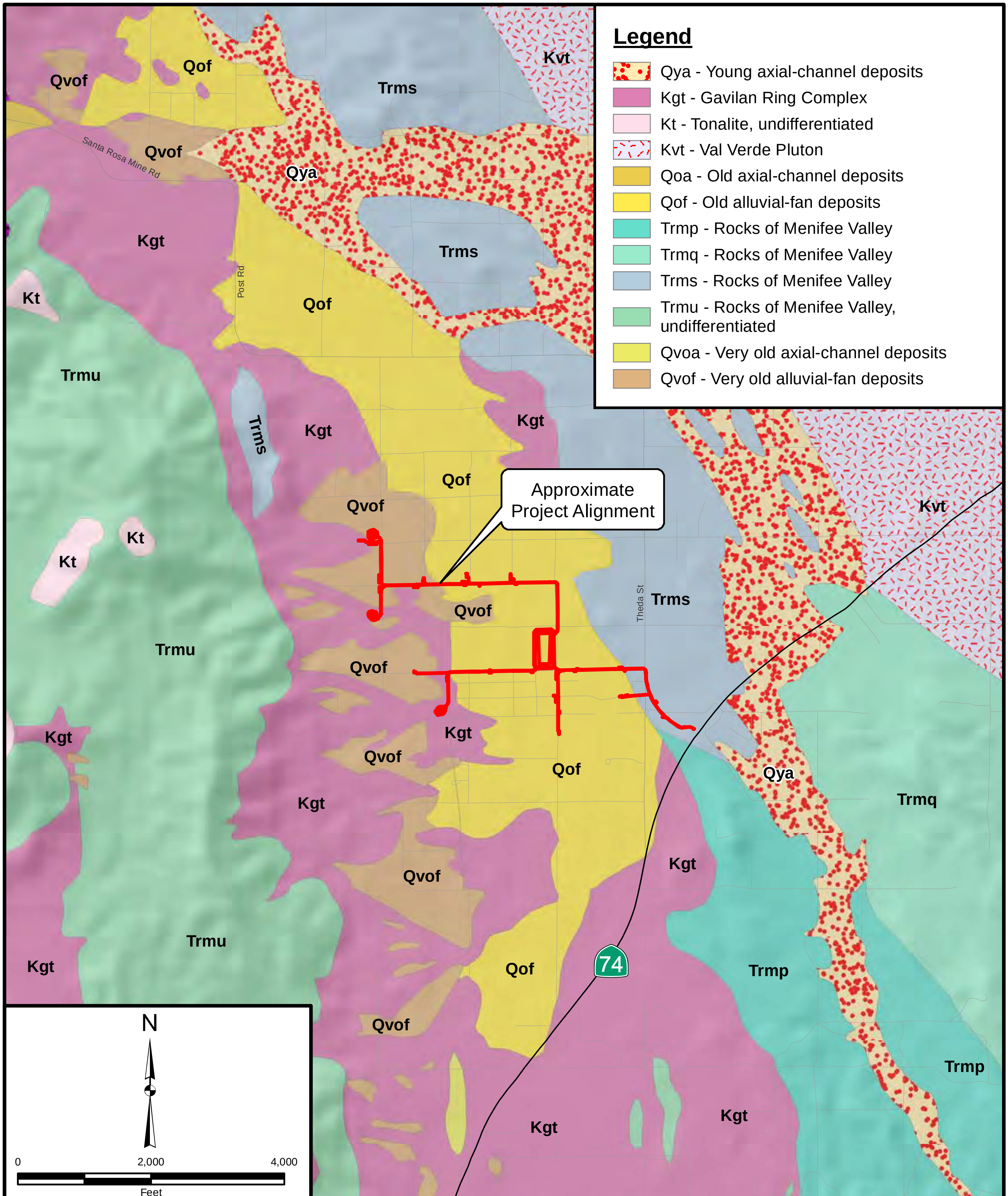
SITE LOCATION MAP

Good Hope - Olive Avenue Storm Drain
Phases1 and 2
Riverside County Flood Control and
Water Conservation District
Unincorporated Riverside County, California

FIGURE 1

Leighton

Map Saved as V:\Drafting\10206\006\Maps\10206-006_F01_SLM_2023-03-10.mxd on 3/10/2023 8:34:07 AM



Project: 10206.006	Eng/Geol: SIS/RFR
Scale:1 " = 2,000 '	Date: March 2023

Reference: USGS, 2006 Geologic map of the San Bernardino and Santa Ana 30'x60 quadrangle, California Version 1,0 Open File Report 2006-1217.
Author: Leighton Geomatics (mmurphy)

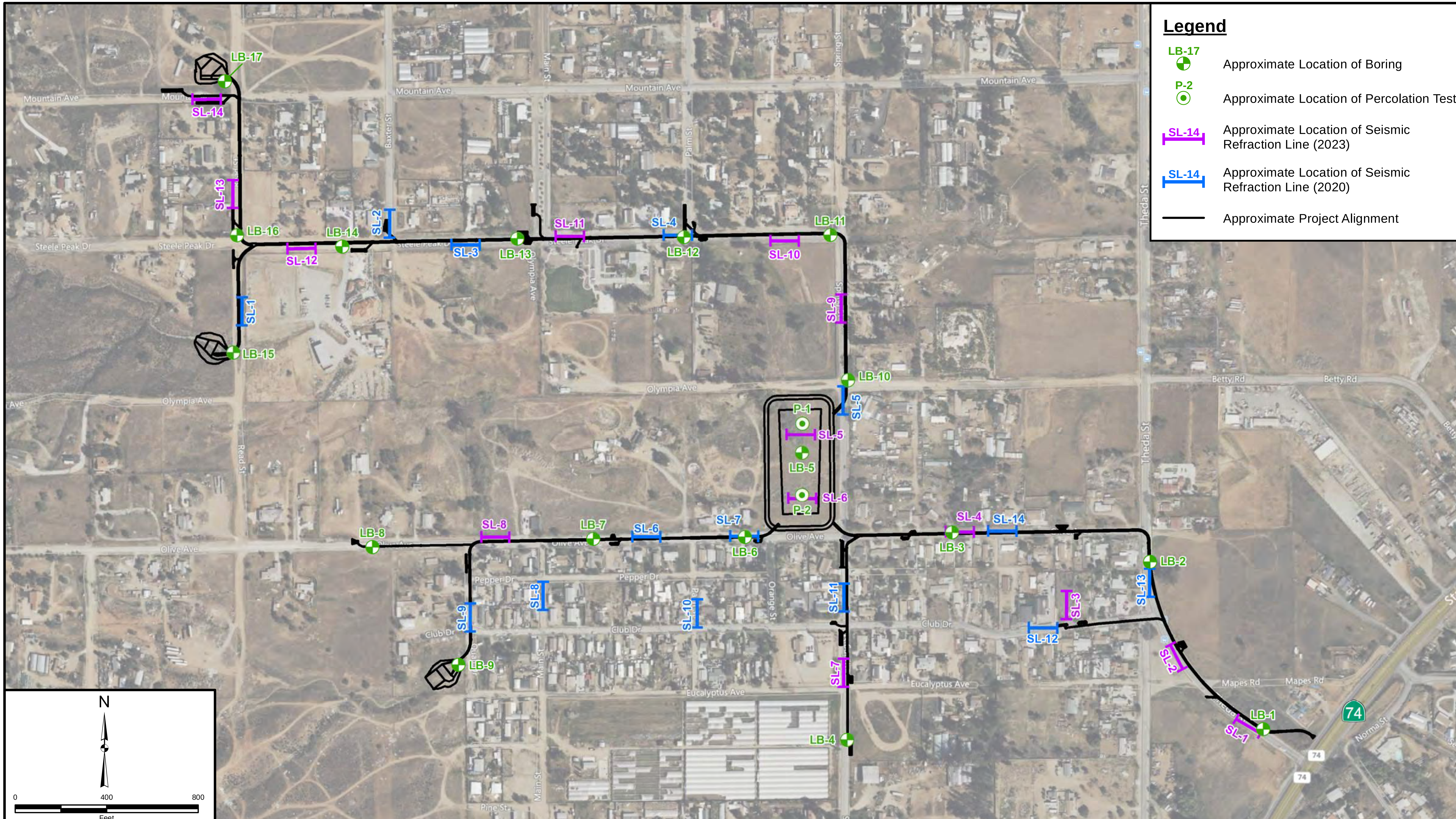
REGIONAL GEOLOGY MAP

Good Hope - Olive Avenue Storm Drain
Phases1 and 2
Riverside County Flood Control and
Water Conservation District
Unincorporated Riverside County, California

FIGURE 2

Leighton

Map Saved as V:\Drafting\10206\006\Maps\10206-006_F02_RGM_2023-03-10.mxd on 3/10/2023 8:33:15 AM



Project: 10206.006	Eng/Geol: SIS/RFR
Scale: 1 " = 400 '	Date: May 2023

Base Map: Bing Maps, 2016 2023

Author: (mmurphy)

BORING AND SEISMIC LINE LOCATION MAP

Good Hope - Olive Avenue Storm Drain

Riverside County Flood Control and Water Conservation District

Unincorporated Riverside County, California

FIGURE 3

Leighton

Map Saved as V:\Drafting\10206\006\Maps\10206-006_F03_BSLM_2023-05-30.mxd on 5/30/2023 3:56:22 PM

APPENDIX A

Field Exploration / Logs of Exploratory Borings

Our field exploration consisted of a site reconnaissance and a subsurface exploration program consisting of hollow-stem auger soil borings. Approximate soil boring locations are shown on the accompanying *Boring Location Map (Figure 3)*. The encountered soil was continuously logged in the field by our representative and described in accordance with the Unified Soil Classification System (ASTM D 2488). Logs of these subsurface explorations, as well as a key to the classification of the soil, are included as part of this appendix.

Relatively undisturbed soil samples were obtained at selected intervals within the borings using a California ring sampler, with 2.42-inch inside diameter brass rings, driven into the soil with a 140-pound hammer falling 30-inches in general accordance with ASTM Test Method D3550. The numbers of blows required for each 6 inches of drive penetration were noted in the field and are recorded on the boring logs. Unless otherwise indicated, the blows per foot recorded on the boring logs represent the number of blows required to drive 18 inches in 6 inch increments. In addition disturbed bag (or bulk) samples were also obtained from soil cuttings. Types of samples obtained from each location are shown on the boring logs at corresponding depths. Our borings were backfilled with soil cuttings obtained during the drilling. Representative soil samples obtained from these subsurface explorations were transported to our Temecula geotechnical laboratory for evaluation and appropriate testing.

The attached subsurface exploration logs and related information depict subsurface conditions only at the locations indicated and at the particular date designated on the logs. Subsurface conditions at other locations may differ from conditions occurring at these locations. The passage of time may result in altered subsurface conditions due to environmental changes. In addition, stratification lines on the logs represent the approximate boundary between soil types and the transition may be gradual.

GEOTECHNICAL BORING LOG LB-1

Project No.	10206.005	**Date Drilled**	3-31-22
Project	RCFCWCD Good Hope - Olive Avenue Storm Drain	**Logged By**	DP
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Geotechnical Map	**Sampled By**	DP

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0							SM	**Artificial Fill (Af)**; SILTY SAND, strong brown, slightly moist, fine to coarse grained sand	
	5			R1 B1	24 50/3"		4.4		**Granitic Bedrock (Kgr)**; Recovered as: SILTY SAND with gravel, dense, yellowish brown, moist, fine to coarse grained sand with coarse gravel, sample disturbed	SA, CR
	10			R2	50/4"				No Recovery	
	15			R3	50/3"				Recovered as: SILTY SAND, dense, yellowish brown, moist, fine to coarse grained sand with gravel, difficult drilling	
									Total Depth 15.25', No groundwater encountered, backfilled with spoils on 03/31/22	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

***** This log is a part of a report by Leighton and should not be used as a stand-alone document. *****

GEOTECHNICAL BORING LOG LB-2

Project No.	10206.005	**Date Drilled**	3-31-22
Project	RCFCWCD Good Hope - Olive Avenue Storm Drain	**Logged By**	DP
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Geotechnical Map	**Sampled By**	DP

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
	0			B1				SM	@ Surface: **Quaternary Alluvium (Qal)**; SILTY SAND, reddish brown, slightly moist, fine to coarse grained sand	
	5			R1	23 49 50/5"	126	5		SILTY SAND, medium dense, reddish brown, moist, fine to coarse grained sand **Granitic Bedrock (Kgr)**; Recovered as: SILTY SAND, dense, light reddish brown, slightly moist, fine to medium grained sand	
	10			R2	50/5"	119	4		As Above	
	15			R3	50/6"				As Above, fine to coarse grained sand	
									Total Depth 15.5', No groundwater encountered, backfilled with spoils on 03/31/22	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG LB-3

Project No.	10206.005	**Date Drilled**	3-31-22
Project	RCFCWCD Good Hope - Olive Avenue Storm Drain	**Logged By**	DP
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Geotechnical Map	**Sampled By**	DP

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
	0								@ Surface: 3" AC over 7" AB	
								SM	**Quaternary Alluvium (Qal)**; SILTY SAND, brown, moist, fine to medium grained sand	
	5			R1	7 11 22	112	18	SC	SILTY SAND, medium dense, olive brown, moist, fine to medium grained sand	
									Granitic Bedrock (Kgr); Recovered as: Poorly Graded SAND with CLAY, dense, dark grayish brown, moist, fine to coarse grained sand	
	10			R2	50/6"				As Above, moist to wet	
	15			R3	50/5"				Recovered as: CLAYEY SAND, dense, dark grayish brown, wet, fine to coarse grained sand	
	20			R4	50/6"				As Above	
									Total Depth 20.5', Groundwater encountered at 12.0' bgs, backfilled with spoils on 03/31/22	
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG LB-4

Project No.	10206.005	**Date Drilled**	3-31-22
Project	RCFCWCD Good Hope - Olive Avenue Storm Drain	**Logged By**	DP
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Geotechnical Map	**Sampled By**	DP

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION *This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	Type of Tests
	0							SM	**Quaternary Alluvium (Qal)** SILT SAND, yellowish brown, moist, fine to coarse grained sand	
	5			B1 R1	50/5"	107	10		**Granitic Bedrock (Kgr)** Recovered as: SILTY SAND, dense, yellowish brown, moist, fine to coarse grained sand	
	10			R2	50/4"				As Above	
	15			R3	50/3"				As Above	
									Total Depth 15.25', No groundwater encountered, backfilled with spoils on 03/31/22	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

*** * * This log is a part of a report by Leighton and should not be used as a stand-alone document. * * ***

GEOTECHNICAL BORING LOG LB-5

Project No.	10206.005	**Date Drilled**	5-25-22
Project	RCFCWCD Good Hope - Olive Avenue Storm Drain	**Logged By**	JTD
Drilling Co.	2-R Drilling Corp	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0							SM	@ Surface: **<u>Quaternary Alluvium (Qal)</u>**; SILTY SAND, light grayish brown, slitghtly moist, fine to coarse grained sand	
	5			R-1 B-1	26 37 53	132	5	SC-SM	**<u>Older Alluvium (Qalo)</u>**; SILTY, CLAYEY SAND with GRAVEL, dense, reddish brown, moist, fine to coarse grained sand with angular gravel to 1"	
	10			R-2	50/2"				**<u>Granitic Bedrock (Kgr)</u>**; Moderately weathered, recovered as: Well-graded SAND with SILT, dense, dark gray, moist, fine to coarse grained sand	
	15			R-3	50/4"				Moderately weathered, recovered as: Well-graded SAND with SILT, dense, dark gray, moist, fine to coarse grained sand	
	20			R-4	50/2"				Moderately weathered, recovered as: Well-graded SAND with SILT, dense, dark gray, moist, fine to coarse grained sand Total Depth = 20.16' bgs, Groundwater encountered as 19' 7" bgs at time of drilling, backfilled with cuttings on 5-26-22	
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

-200	% FINES PASSING	DS	DIRECT SHEAR	SA	SIEVE ANALYSIS
AL	ATTERBERG LIMITS	EI	EXPANSION INDEX	SE	SAND EQUIVALENT
CN	CONSOLIDATION	H	HYDROMETER	SG	SPECIFIC GRAVITY
CO	COLLAPSE	MD	MAXIMUM DENSITY	UC	UNCONFINED COMPRESSIVE STRENGTH
CR	CORROSION	PP	POCKET PENETROMETER		
CU	UNDRAINED TRIAXIAL	RV	R VALUE		

Leighton

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG LB-6

Project No.	10206.005	**Date Drilled**	3-31-22
Project	RCFCWCD Good Hope - Olive Avenue Storm Drain	**Logged By**	DP
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Geotechnical Map	**Sampled By**	DP

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
	0							SM	**Quaternary Alluvium (Qal)**; SILTY SAND, yellowish brown, moist, fine to coarse grained sand	
	5			B1 R1	7 10 20	117	14		SILTY SAND, medium dense, yellowish brown, moist, fine to medium grained sand, SE=20	SE
	10			R2	50/5"	111	5		**Granitic Bedrock (Kgr)**; Recovered as: Well-graded SAND with SILT, dense, dark grayish brown, slightly moist, fine to coarse grained sand	
	15			R3	50/6"				As Above	
	20			R4	50/4"				As Above	
									Total Depth 20.33', No groundwater encountered, backfilled with spoils on 03/31/22	
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

* * * This log is a part of a report by Leighton and should not be used as a stand-alone document. * * *

GEOTECHNICAL BORING LOG LB-7

Project No.	10206.005	**Date Drilled**	3-31-22
Project	RCFCWCD Good Hope - Olive Avenue Storm Drain	**Logged By**	DP
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Geotechnical Map	**Sampled By**	DP

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION *This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	Type of Tests
	0							SM	**Quaternary Alluvium (Qal)**; SILTY SAND, yellowish brown, moist, fine to coarse grained sand	
				R1	50/6"	118	3		**Granitic Bedrock (Kgr)**; Recovered as: Well-graded SAND with SILT, dense, grayish brown, slightly moist, fine to coarse grained sand	
	5			R2	50/2"				As Above	
	10			R3	50/4"				As Above	
	15			R4	50/4"				As Above	
	20			R5	50/3"				No Recovery	
									Total Depth 20.25', Groundwater encountered at 13.0' bgs, backfilled with spoils on 03/31/22	
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

GEOTECHNICAL BORING LOG LB-8

Project No.	10206.005	**Date Drilled**	3-31-22
Project	RCFCWCD Good Hope - Olive Avenue Storm Drain	**Logged By**	DP
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Geotechnical Map	**Sampled By**	DP

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0							SC	**Quaternary Alluvium (Qal)**; CLAYEY SAND, dark reddish brown, moist, fine to coarse grained sand	
								SM	SILTY SAND, brown, moist, fine to coarse grained sand	
									Granitic Bedrock (Kgr) recovered as: Well-graded SAND with SILT, grayish brown, slightly moist, fine to coarse grained sand	
	5			R1	30 50/4"	120	4			
	10			R2	50/5"				As Above	
	15			R3	50/4"				No Recovery	
	20			R4	50/3"				No Recovery	
									Total Depth 20.25', No groundwater encountered, backfilled with spoils on 03/31/22	
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

GEOTECHNICAL BORING LOG LB-9

Project No.	10206.005	**Date Drilled**	5-25-22
Project	RCFCWCD Good Hope - Olive Avenue Storm Drain	**Logged By**	JTD
Drilling Co.	2-R Drilling Corp	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
	0							SM	@ Surface: **Quaternary Alluvium (Qal)**; SILTY SAND with GRAVEL, light grayish brown, slightly moist, fine to coarse grained sand with gravel to 1", concrete/grout block drilled through to 1.5'.	
				R-1 B-1	16 50/6"				SILTY SAND, medium dense, dark brown, moist, fine to coarse grained sand	
									Granitic Bedrock (Kgr); Highly weathered, recovered as: SILTY SAND, dense, grayish brown, moist, fine to coarse grained sand	
	5			R-2	50/5"				Moderately weathered, recovered as: Well-graded SAND with SILT and GRAVEL, dense, dark gray, moist, fine to coarse grained sand with fine gravel	
	10			R-3	25 50/5"	130	5		Moderately weathered, recovered as: Well-graded SAND with SILT and GRAVEL, dense, dark gray, moist, fine to coarse grained sand with fine gravel	
									Auger Refusal @ 12.5' bgs, no groundwater encountered, backfilled with cuttings on 5/25/22	
	15									
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

*** * * This log is a part of a report by Leighton and should not be used as a stand-alone document. * * ***

GEOTECHNICAL BORING LOG LB-10

Project No.	10206.005	**Date Drilled**	3-31-22
Project	RCFCWCD Good Hope - Olive Avenue Storm Drain	**Logged By**	DP
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Geotechnical Map	**Sampled By**	DP

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0								@ Surface: 3" AC over 6" AB	
								SM	**Quaternary Alluvium (Qal)**; SILTY SAND, reddish brown, slightly moist, fine to coarse grained sand	
	5			R1	19 34 50/1"	115	6		SILTY SAND, medium dense, reddish brown, moist, fine to meidum grained sand	
									Granitic Bedrock (Kgr); Recovered as: SILTY SAND, dense, brown, moist, fine to coarse grained sand	
	10			R2	50/5"	114	3		As Above	
	15			R3	50/6"				As Above	
									Total Depth 15.5', No groundwater encountered, backfilled with spoils on 03/31/22	
	20									
	25									
	30									

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

* * * This log is a part of a report by Leighton and should not be used as a stand-alone document. * * *

GEOTECHNICAL BORING LOG LB-11

Project No.	10206.005	**Date Drilled**	3-31-22
Project	RCFCWCD Good Hope - Olive Avenue Storm Drain	**Logged By**	DP
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Geotechnical Map	**Sampled By**	DP

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0							SM	**Quaternary Alluvium (Qal)**; SILTY SAND, light reddish brown, slightly moist, fine to coarse grained sand	
	5			B1 R1	12 17 27	113	6		SILTY SAND, medium dense, reddish brown, moist, fine to medium grained sand	
	10			R2	31 50/6"				**Granitic Bedrock (Kgr)**; Recovered as: SILTY SAND, brown, moist, fine to coarse grained sand	
	15			R3	14 22 31				As Above	
									Total Depth 16.5', No groundwater encountered, backfilled with spoils on 03/31/22	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

* * * This log is a part of a report by Leighton and should not be used as a stand-alone document. * * *

GEOTECHNICAL BORING LOG LB-12

Project No.	10206.005	**Date Drilled**	5-25-22
Project	RCFCWCD Good Hope - Olive Avenue Storm Drain	**Logged By**	JTD
Drilling Co.	2-R Drilling Corp	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
	0			B-1				SM	@ Surface: **Artificial Fill (Af)**; SILTY SAND with GRAVEL, light grayish brown, slightly moist, fine to coarse grained sand with gravel to 1", SE = 25	SE
									SILTY SAND, dark yellowish brown, moist, fine to coarse grained sand	
	5			R-1	5 50/4"	113	4		SILTY SAND, loose, dark yellowish brown, moist, fine to coarse grained sand	
									Granitic Bedrock (Kgr); Highly weathered, recovered as: SILTY SAND, dense, light grayish brown, moist, fine to coarse grained sand	
	10			R-2	50/3"				Moderately weathered, recovered as: SILTY SAND, dense, dark grayish brown, moist, fine to coarse grained sand	
	15			R-3	50/2"				Moderately weathered, recovered as: SILTY SAND, dense, dark grayish brown, moist, fine to coarse grained sand	
	20			R-4	50/1"				Moderately weathered, recovered as: SILTY SAND, dense, dark gray, moist, fine to coarse grained sand	
									Total Depth = 20.08' bgs, no groundwater encountered, backfilled with cuttings on 5/25/22	
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG LB-13

Project No.	10206.005	**Date Drilled**	5-25-22
Project	RCFCWCD Good Hope - Olive Avenue Storm Drain	**Logged By**	JTD
Drilling Co.	2-R Drilling Corp	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION *This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	Type of Tests
	0			B-1				SM	@ Surface: **Artificial Fill (Af)**; SILTY SAND with GRAVEL, light grayish brown, slightly moist, fine to coarse grained sand with fine gravel	
				R-1	50/3"				**Granitic Bedrock (Kgr)**; Severely weathered, recovered as: SILTY SAND, dense, grayish brown, moist, fine to coarse grained sand	
	5			R-2 B-2	50/4"				Severely weathered, recovered as: SILTY SAND, dense, grayish brown, moist, fine to coarse grained sand	
	10			R-3	50/2"				Moderately Weathered, recovered as: Well-graded SAND with SILT, dense, grayish brown, moist, fine to coarse grained sand	
	15			R-4	50/4"				Moderately Weathered, recovered as: Well-graded SAND with SILT, dense, dark gray, moist, fine to coarse grained sand	
									Total Depth = 15.33' bgs, no groundwater enocuntered, backfilled with cuttings on 5/25/22	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

*** * * This log is a part of a report by Leighton and should not be used as a stand-alone document. * * ***

GEOTECHNICAL BORING LOG LB-14

Project No.	10206.005	**Date Drilled**	5-25-22
Project	RCFCWCD Good Hope - Olive Avenue Storm Drain	**Logged By**	JTD
Drilling Co.	2-R Drilling Corp	**Hole Diameter**	8"
Drilling Method	Hand Auger - 140lb - Hand Sampling	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION *This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	Type of Tests
	0								@ Surface: **Artificial Fill (Af)**; SILTY SAND, light grayish brown, slightly moist, fine to coarse grained sand	
									Well-graded SAND, light gray, slightly moist, fine to coarse grained sand	
	5								Hole stopped at 4' due to encountering buried utilities, backfilled with cuttings on 5/25/22	
	10									
	15									
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG LB-15

Project No.	10206.005	**Date Drilled**	5-25-22
Project	RCFCWCD Good Hope - Olive Avenue Storm Drain	**Logged By**	JTD
Drilling Co.	2-R Drilling Corp	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	Soil Description	Type of Tests
	0								@ Surface: **<u>Granitic Bedrock (Kgr)</u>**; Highly weathered, recovered as: SILTY SAND with GRAVEL, grayish brown, slightly moist, fine to coarse grained sand	
	5			R-1	50/4"	138	3		Moderately weathered, recovered as: Well-graded SAND with SILT, dense, dark gray, moist, fine to coarse grained sand	
	10			R-2	50/3"				Moderately weathered, recovered as: Well-graded SAND with SILT, dense, dark gray, moist, fine to coarse grained sand	
	15			R-3	50/2"				Moderately weathered, recovered as: Well-graded SAND with SILT, dense, dark gray, moist, fine to coarse grained sand	
									Total Depth = 15.16' bgs, no groundwater encountered, backfilled with cuttings on 5/25/22	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

*** * * This log is a part of a report by Leighton and should not be used as a stand-alone document. * * ***

GEOTECHNICAL BORING LOG LB-17

Project No.	10206.005	**Date Drilled**	5-25-22
Project	RCFCWCD Good Hope - Olive Avenue Storm Drain	**Logged By**	JTD
Drilling Co.	2-R Drilling Corp	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
	0			B-1				SM	@ Surface: **Quaternary Alluvium (Qal)**; SILTY SAND with GRAVEL, brown, slightly moist, fine to coarse grained sand with fine gravel, MD = 129.0 @ 8.5%	MD, SA, CR
				R-1	15 15 18	118	2		SILTY SAND, medium dense, light grayish brown, moist, fine to coarse grained sand	
	5			R-2	14 16 17	113	5		SILT SAND, medium dense, dark gray, moist, fine to medium grained sand	
	10			R-3	50/4"				**Granitic Bedrock (Kgr)**; Moderately weathered, recovered as: Well-graded SAND with SILT, dense, dark gray, moist, fine to coarse grained sand	
	15			R-4	50/2"				Moderately weathered, recovered as: Well-graded SAND with SILT, dense, dark gray, moist, fine to coarse grained sand	
	20			R-5	50/1"				Moderately weathered, recovered as: Well-graded SAND with SILT, dense, dark gray, moist, fine to coarse grained sand Total Depth = 20.08' bgs, no groundwater encountered, backfilled with cuttings on 5/25/22	
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

*** * * This log is a part of a report by Leighton and should not be used as a stand-alone document. * * ***

GEOTECHNICAL BORING LOG P-1

Project No.	10206.005	**Date Drilled**	5-25-22
Project	RCFCWCD Good Hope - Olive Avenue Storm Drain	**Logged By**	JTD
Drilling Co.	2-R Drilling Corp	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
	0							SM	@ Surface: **Quaternary Alluvium (Qal)**; SILTY SAND with GRAVEL, light grayish brown, sightly moist, fine to coarse grained sand with fine gravel	
	5							SC-SM	**Older Alluvium (Qalo)**; SILTY, CLAYEY SAND with GRAVEL, dark reddish brown, moist, fine to coarse grained sand with angular gravel to 1"	
									Granitic Bedrock (Kgr); Moderately weathered, recovered as: Well-graded SAND with SILT, grayish brown, moist, fine to coarse grained sand	
				S-1	33 50/5"				Moderately weathered, recovered as: SILTY SAND, dense, gray, moist, fine to coarse grained sand	SA
	10									
									Total Depth = 10' bgs, no groundwater encountered, backfilled with cuttings on 5/26/22	
	15									
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

*** * * This log is a part of a report by Leighton and should not be used as a stand-alone document. * * ***

GEOTECHNICAL BORING LOG P-2

Project No.	10206.005	**Date Drilled**	5-25-22
Project	RCFCWCD Good Hope - Olive Avenue Storm Drain	**Logged By**	JTD
Drilling Co.	2-R Drilling Corp	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

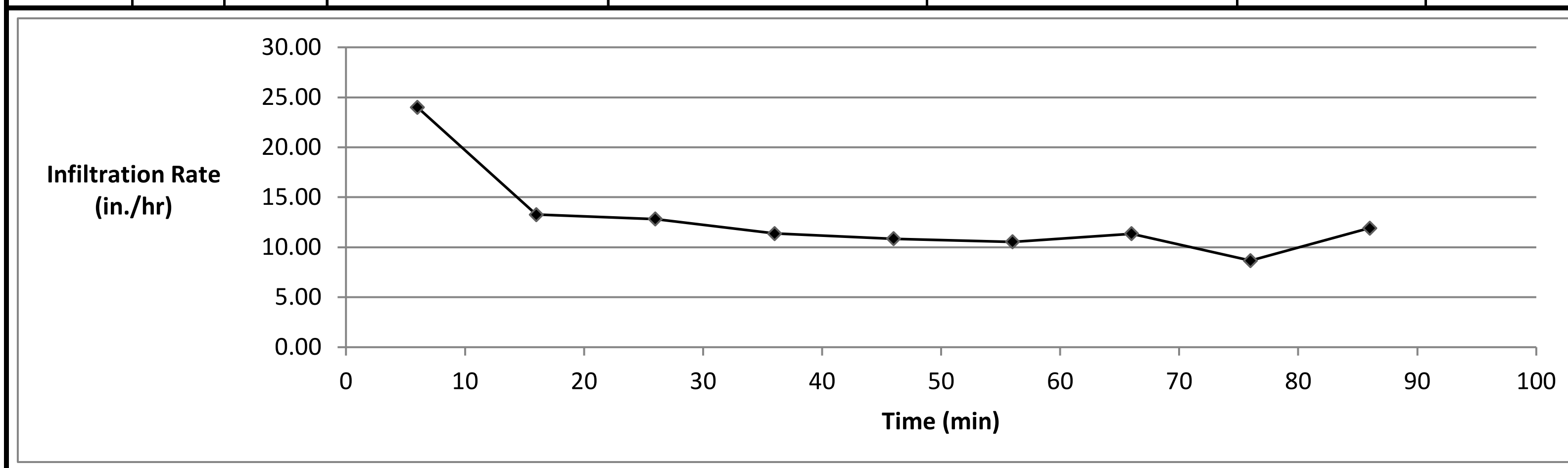
Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
	0							SM	@ Surface: **Quaternary Alluvium (Qal)**; SILTY SAND, brown, slightly moist, fine to coarse grained sand	
									SILTY SAND, grayish brown, moist, fine to coarse grained sand, trace cobble	
	5									
				S-1	3 3 4			SC-SM	SILTY, CLAYEY SAND with GRAVEL, loose, dark grayish brown, moist, fine to coarse grained sand with fine angular gravel	
	10								Total Depth = 10' bgs, no groundwater encountered, backfilled with cuttings on 5/26/22	
	15									
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Test Hole Number:	P-1	Project	RCFC Good Hope SD	
Date Excavated:	5/25/2022	Project Number	10206.005	
Tested by:	JTD	Date Tested	5/26/2022	
Soil Unit:	Granitic Bedrock (Kgr)	Depth of Test Hole (in.)	120	85 °
USCS Soil Type:	Well-Graded SAND with SILT	Diameter (in.)	8	Effective Radius (in) 4

Time	Δt (min)	Total Time (min)	Initial Water Depth (inches)	Final Water Depth (inches)	Change In Water Level (inches)	Infiltration Rate* (inches/hour)	Peroclation Rate (minute/inch)
7:36:00 7:42:00	6	6	94.00	115.00	21.00	24.00	0.3
7:44:00 7:54:00	10	16	92.00	113.35	21.35	13.26	0.5
7:55:00 8:05:00	10	26	94.00	113.50	19.50	12.82	0.5
8:05:00 8:15:00	10	36	97.50	113.25	15.75	11.37	0.6
8:15:00 8:25:00	10	46	97.50	112.75	15.25	10.84	0.7
8:25:00 8:35:00	10	56	97.00	112.25	15.25	10.53	0.7
8:35:00 8:45:00	10	66	98.25	113.50	15.25	11.35	0.7
8:45:00 8:55:00	10	76	93.25	108.50	15.25	8.66	0.7
8:55:00 9:05:00	10	86	99.00	114.25	15.25	11.90	0.7



* Based on Porchet Method

Percolation Test Data

P- 1

Project Number: 10206.005

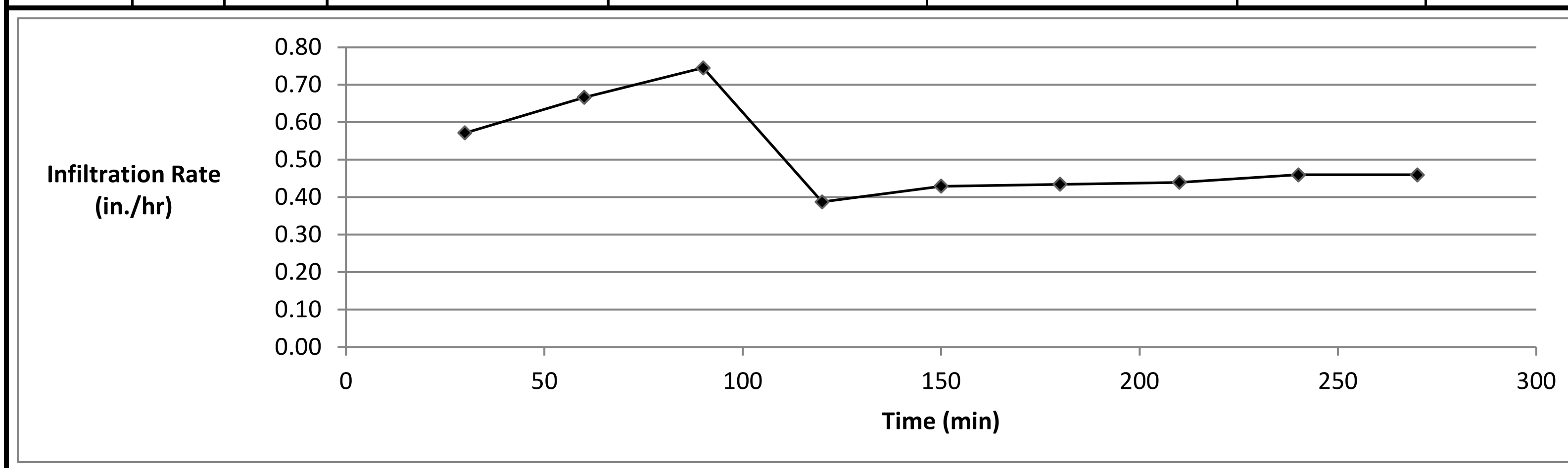
Project Name: *RCFC Good Hope SD*

Date: May-22

Leighton

Test Hole Number:	P-2	Project	RCFC Good Hope SD	
Date Excavated:	5/25/2022	Project Number	10206.005	
Tested by:	JTD	Date Tested	5/26/2022	
Soil Unit:	Quaternary Alluvium (Qal)	Depth of Test Hole (in.)	120	85 °
USCS Soil Type:	SILTY-CLAYEY SAND	Diameter (in.)	8	Effective Radius (in) 4

Time	Δt (min)	Total Time (min)	Initial Water Depth (inches)	Final Water Depth (inches)	Change In Water Level (inches)	Infiltration Rate* (inches/hour)	Peroclation Rate (minute/inch)
7:39:00 8:09:00	30	30	92.00	96.00	4.00	0.57	7.5
8:09:00 8:39:00	30	60	96.00	100.00	4.00	0.67	7.5
8:39:00 9:09:00	30	90	100.00	103.75	3.75	0.75	8.0
9:09:00 9:39:00	30	120	92.25	95.00	2.75	0.39	10.9
9:39:00 10:09:00	30	150	95.00	97.75	2.75	0.43	10.9
10:09:00 10:39:00	30	180	97.75	100.25	2.50	0.43	12.0
10:39:00 11:09:00	30	210	98.00	100.50	2.50	0.44	12.0
11:09:00 11:39:00	30	240	99.00	101.50	2.50	0.46	12.0
11:39:00 12:09:00	30	270	99.00	101.50	2.50	0.46	12.0



* Based on Porchet Method

Percolation Test Data P-2	***Project Number:*** 10206.005 ***Project Name:*** *RCFC Good Hope SD* ***Date:*** May-22	Leighton

APPENDIX B

Results of Laboratory Testing

MODIFIED PROCTOR COMPACTION TEST

ASTM D 1557

Project Name:	Good Hope/Olive Ave Storm Drain	Tested By:	F. Mina	Date:	04/26/22
Project No.:	10206.005	Input By:	M. Vinet	Date:	04/26/22
Boring No.:	LB-11	Depth (ft.):	5.0 - 10.0		
Sample No.:	B-1				
Soil Identification:	Silty Sand (SM), Yellowish Brown.				

Preparation Method: [X] Moist [ ] Dry — [X] Mechanical Ram [ ] Manual Ram

Mold Volume (ft^3) 0.03340 — *Ram Weight = 10 lb.; Drop = 18 in.*

TEST NO.	1	2	3	4	5	6
Wt. Compacted Soil + Mold (g)	5580	5669	5701	5621		
Weight of Mold (g)	3538	3538	3538	3538		
Net Weight of Soil (g)	2042	2131	2163	2083		
Wet Weight of Soil + Cont. (g)	807.3	2403.2	2436.0	2357.9		
Dry Weight of Soil + Cont. (g)	779.7	2255.4	2249.8	2143.7		
Weight of Container (g)	280.9	281.0	277.5	275.6		
Moisture Content (%)	5.5	7.5	9.4	11.5		
Wet Density (pcf)	134.8	140.7	142.8	137.5		
Dry Density (pcf)	127.7	130.9	130.5	123.3		

Maximum Dry Density (pcf) **131.3** **Optimum Moisture Content (%)** **8.3**

PROCEDURE USED

[X] **Procedure A**
Soil Passing No. 4 (4.75 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
May be used if +#4 is 20% or less

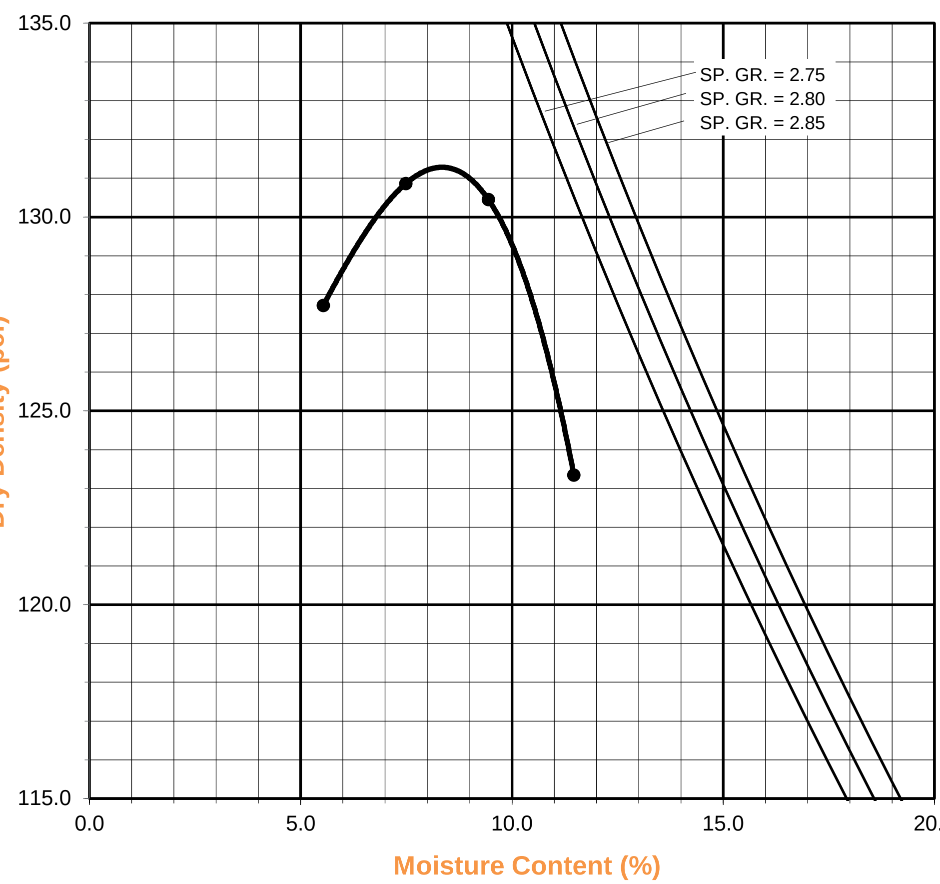
[ ] **Procedure B**
Soil Passing 3/8 in. (9.5 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
Use if +#4 is >20% and +3/8 in. is 20% or less

[ ] **Procedure C**
Soil Passing 3/4 in. (19.0 mm) Sieve
Mold : 6 in. (152.4 mm) diameter
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
Use if +3/8 in. is >20% and +¾ in. is <30%

Particle-Size Distribution:
2::63:35
GR:SA:FI

Atterberg Limits:

LL,PL,PI



Compaction; LB-11, B-1 (03-31-22)

MODIFIED PROCTOR COMPACTION TEST
ASTM D 1557

Leighton

Project Name:	Good Hope/Olive Ave Storm Drain	Tested By:	M. Vinet	Date:	06/07/22
Project No.:	10206.005	Input By:	M. Vinet	Date:	06/08/22
Boring No.:	LB-17	Depth (ft.):	0 - 5.0		
Sample No.:	B-1				
Soil Identification:	Silty Sand (SM), Yellowish Brown.				

Note: Corrected dry density calculation assumes specific gravity of 2.70 and moisture content of 1.0% for oversize particles

Preparation Method:	X	Moist
		Dry
Compaction Method	X	Mechanical Ram
		Manual Ram

Scalp Fraction (%)	
#3/4	7.8
#3/8	
#4	

Rammer Weight (lb.) = 10.0
Height of Drop (in.) = 18.0
Mold Volume (ft^3) 0.07500

TEST NO.	1	2	3	4	5	6
Wt. Compacted Soil + Mold (g)	9920	10097	10206	10163		
Weight of Mold (g)	5506	5506	5506	5506		
Net Weight of Soil (g)	4414	4591	4700	4657		
Wet Weight of Soil + Cont. (g)	1362.2	1250.0	1309.5	1263.2		
Dry Weight of Soil + Cont. (g)	1309.2	1185.8	1226.7	1168.2		
Weight of Container (g)	328.4	327.4	332.5	327.8		
Moisture Content (%)	5.4	7.5	9.3	11.3		
Wet Density (pcf)	129.7	135.0	138.2	136.9		
Dry Density (pcf)	123.1	125.6	126.4	123.0		

Maximum Dry Density (pcf)	**126.5**	**Optimum Moisture Content (%)**	**9.0**
Corrected Dry Density (pcf)	**129.0**	**Corrected Moisture Content (%)**	**8.5**

☐ **Procedure A**
Soil Passing No. 4 (4.75 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
May be used if +#4 is 20% or less

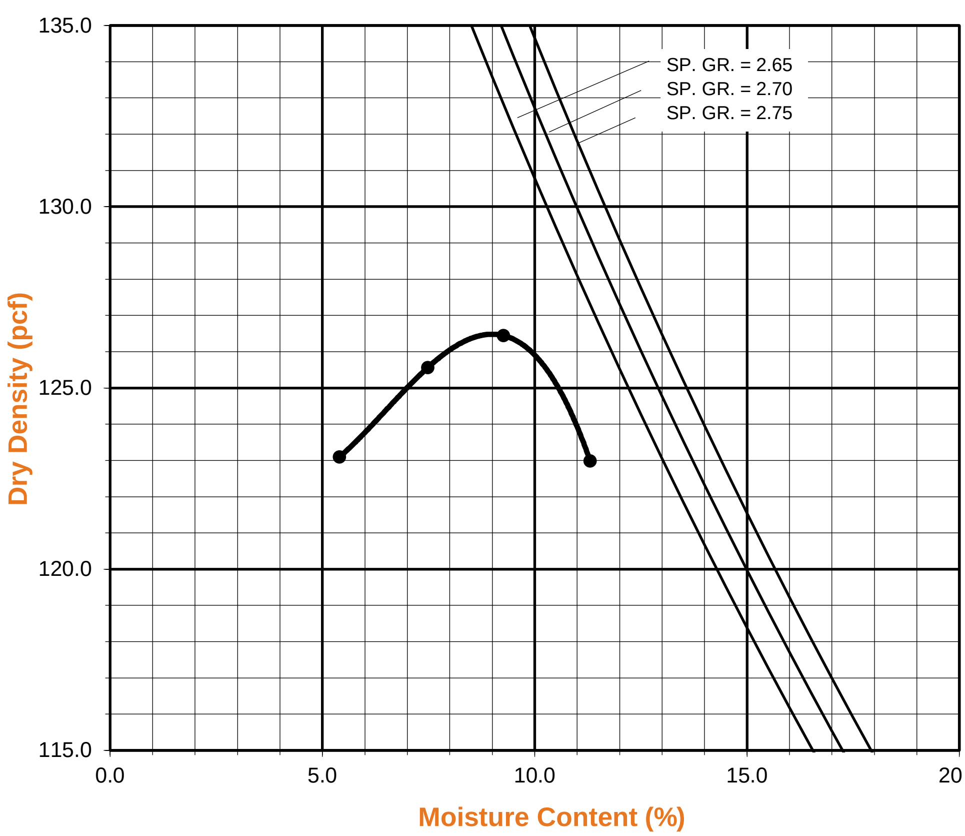
☐ **Procedure B**
Soil Passing 3/8 in. (9.5 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
Use if +#4 is >20% and +3/8 in. is 20% or less

☒ **Procedure C**
Soil Passing 3/4 in. (19.0 mm) Sieve
Mold : 6 in. (152.4 mm) diameter
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
Use if +3/8 in. is >20% and +¾ in. is <30%

Particle-Size Distribution:
13:72:15
GR:SA:FI

Atterberg Limits:

LL,PL,PI



PARTICLE-SIZE DISTRIBUTION (GRADATION) of SOILS USING SIEVE ANALYSIS
ASTM D 6913

Project Name:	Good Hope/Olive Ave Storm Drain	Tested By:	MRV	Date:	04/20/22
Project No.:	10206.005	Checked By:	MRV	Date:	04/26/22
Boring No.:	LB-11	Depth (feet):	5.0 - 10.0		
Sample No.:	B-1				
Soil Identification:	Silty Sand (SM), Yellowish Brown.				

		Moisture Content of Total Air - Dry Soil	
Container No.:	L	Wt. of Air-Dry Soil + Cont. (g)	807.3
Wt. of Air-Dried Soil + Cont.(g)	807.3	Wt. of Dry Soil + Cont. (g)	779.7
Wt. of Container (g)	280.9	Wt. of Container No.______ (g)	280.9
Dry Wt. of Soil (g)	498.8	Moisture Content (%)	5.5

After Wet Sieve	Container No.	L
	Wt. of Dry Soil + Container (g)	627.6
	Wt. of Container (g)	280.9
	Dry Wt. of Soil Retained on # 200 Sieve (g)	346.7

U. S. Sieve Size (in.)	U. S. Sieve Size (mm.)	Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
3"	75.000		100.0
1"	25.000		100.0
3/4"	19.000		100.0
1/2"	12.500		100.0
3/8"	9.500	0.0	100.0
#4	4.750	10.2	98.0
#8	2.360	26.2	94.7
#16	1.180	70.0	86.0
#30	0.600	124.4	75.1
#50	0.300	193.3	61.2
#100	0.150	261.5	47.6
#200	0.075	324.8	34.9
PAN			

GRAVEL: **2 %**

SAND: **63 %**

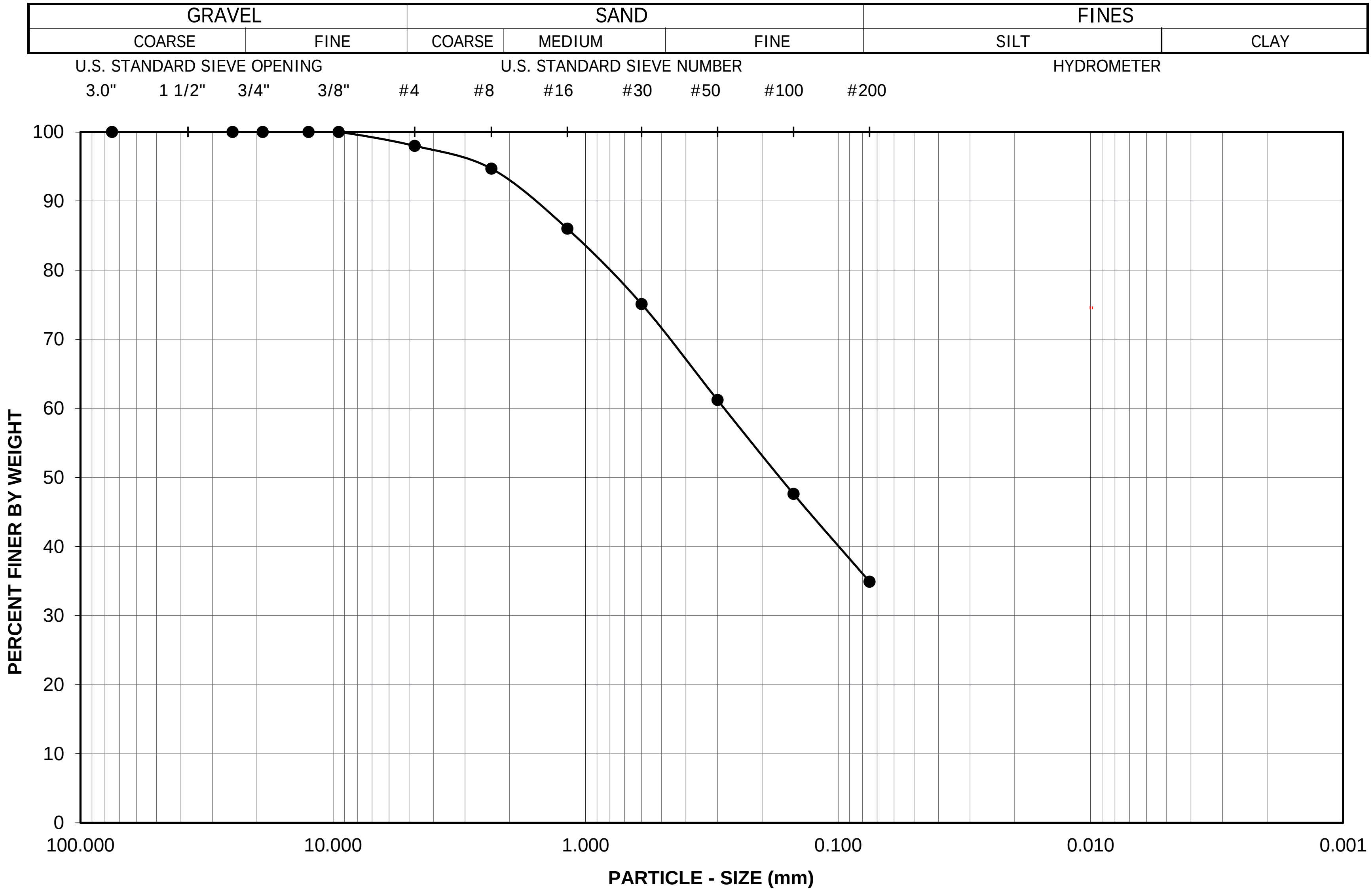
FINES: **35 %**

GROUP SYMBOL: **SM**

Cu = D60/D10 = N/A

Cc = $(D30)^2/(D60*D10)$ = N/A

Remarks:



Project Name: Good Hope/Olive Ave Storm Drain

Project No.: 10206.005

Boring No.: LB-11 Sample No.: B-1

Depth (feet): 5.0 - 10.0 Soil Type : SM

Soil Identification: Silty Sand (SM), Yellowish Brown.

Leighton

PARTICLE - SIZE DISTRIBUTION ASTM D 6913

GR:SA:FI : (%) 2 : 63 : 35

Apr-22

PARTICLE-SIZE DISTRIBUTION (GRADATION) of SOILS USING SIEVE ANALYSIS
ASTM D 6913

Leighton

Project Name:	Good Hope/Olive Ave Storm Drain	Tested By:	MRV	Date:	06/07/22
Project No.:	10206.005	Checked By:	MRV	Date:	06/08/22
Boring No.:	LB-17	Depth (feet):	0 - 5.0		
Sample No.:	B-1				
Soil Identification:	Silty Sand (SM), Yellowish Brown.				

Calculation of Dry Weights	Whole Sample	Sample Passing #4	Moisture Contents	Whole Sample	Sample passing #4
Container No.:	B	B	Wt. of Air-Dry Soil + Cont.(g)	2153.1	1011.7
Wt. Air-Dried Soil + Cont.(g)	2153.1	1011.7	Wt. of Dry Soil + Cont. (g)	2129.5	1011.7
Wt. of Container (g)	673.2	673.2	Wt. of Container No.______(g)	673.2	673.2
Dry Wt. of Soil (g)	1456.6	338.5	Moisture Content (%)	1.6	0.0

Passing #4 Material After Wet Sieve		
	Container No.	B
	Wt. of Dry Soil + Container (g)	964.1
	Wt. of Container (g)	673.2
	Dry Wt. of Soil Retained on # 200 Sieve (g)	290.9

U. S. Sieve Size		Cumulative Weight of Dry Soil Retained (g)		Percent Passing (%)
	(mm.)	Whole Sample	Sample Passing #4	
1 1/2"	37.500	0.0		100.0
1"	25.000	100.3		93.1
3/4"	19.000	113.6		92.2
1/2"	12.500	145.3		90.0
3/8"	9.500	151.6		89.6
#4	4.750	192.9		86.8
#8	2.360		11.0	84.0
#16	1.180		52.0	73.5
#30	0.600		108.5	59.0
#50	0.300		178.8	41.0
#100	0.150		240.0	25.3
#200	0.075		280.6	14.8
PAN				

GRAVEL: **13 %**

SAND: **72 %**

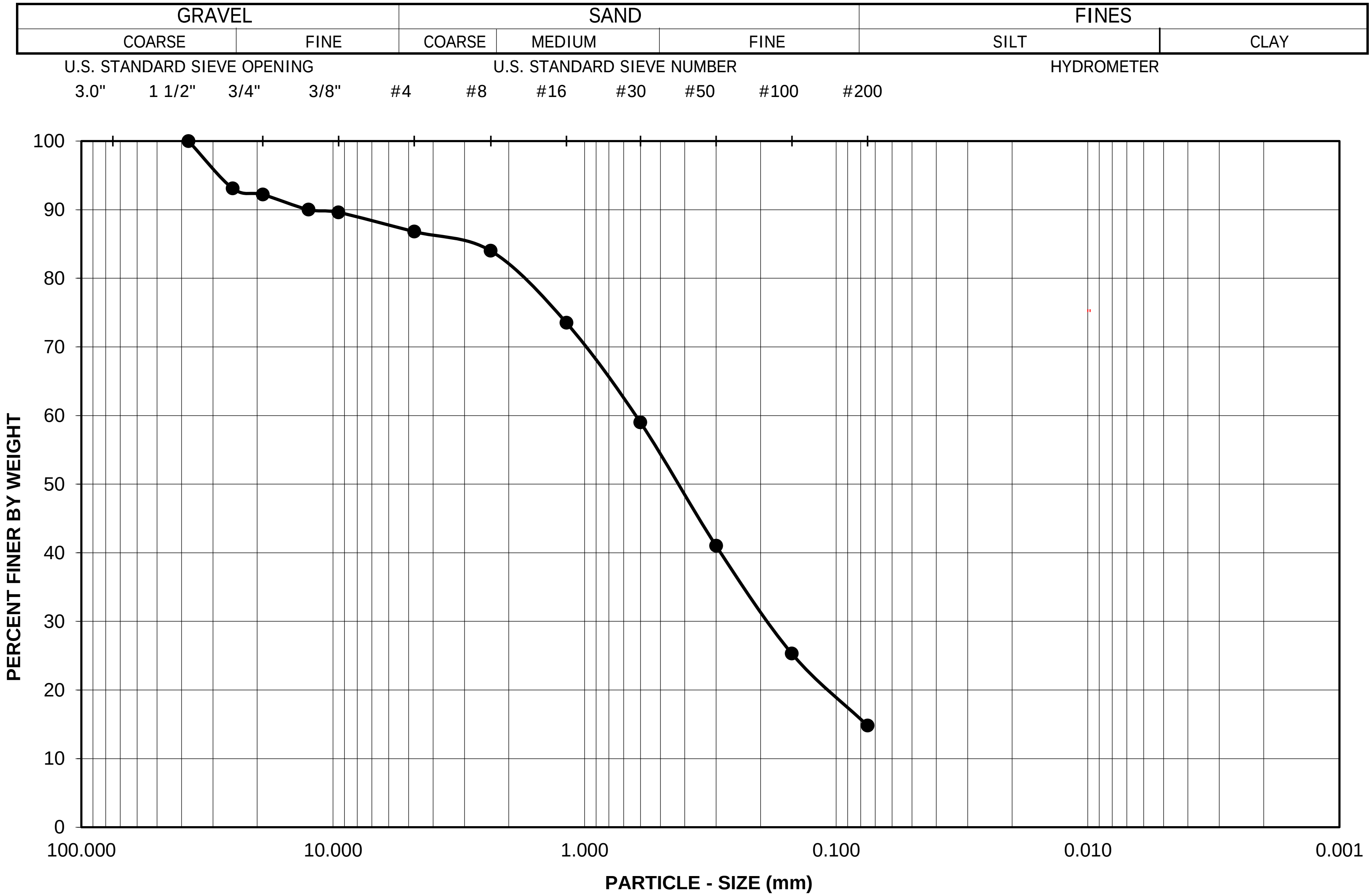
FINES: **15 %**

GROUP SYMBOL: **SM**

Cu = D60/D10 = N/A

Cc = (D30)²/(D60*D10) = N/A

Remarks:



Project Name: Good Hope/Olive Ave Storm Drain

Project No.: 10206.005

Boring No.: LB-17 Sample No.: B-1

Depth (feet): 0 - 5.0 Soil Type : SM

Soil Identification: Silty Sand (SM), Yellowish Brown.

Leighton

PARTICLE - SIZE DISTRIBUTION ASTM D 6913

GR:SA:FI : (%) 13 : 72 : 15

Jun-22

PARTICLE-SIZE DISTRIBUTION (GRADATION) of SOILS USING SIEVE ANALYSIS
ASTM D 6913

Leighton

Project Name:	Good Hope/Olive Ave Storm Drain	Tested By:	MRV	Date:	06/07/22
Project No.:	10206.005	Checked By:	MRV	Date:	06/08/22
Boring No.:	P-1	Depth (feet):	8.5		
Sample No.:	B-1				
Soil Identification:	Silty Sand (SM), Yellowish Brown.				

		Moisture Content of Total Air - Dry Soil	
Container No.:	M	Wt. of Air-Dry Soil + Cont. (g)	1063.6
Wt. of Air-Dried Soil + Cont.(g)	1063.6	Wt. of Dry Soil + Cont. (g)	1043.3
Wt. of Container (g)	666.7	Wt. of Container No.______ (g)	666.7
Dry Wt. of Soil (g)	376.6	Moisture Content (%)	5.4

After Wet Sieve	Container No.	M
	Wt. of Dry Soil + Container (g)	970.7
	Wt. of Container (g)	666.7
	Dry Wt. of Soil Retained on # 200 Sieve (g)	304.0

U. S. Sieve Size (in.)	U. S. Sieve Size (mm.)	Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
3"	75.000		100.0
1"	25.000		100.0
3/4"	19.000		100.0
1/2"	12.500		100.0
3/8"	9.500	0.0	100.0
#4	4.750	2.3	99.4
#8	2.360	36.6	90.3
#16	1.180	117.3	68.9
#30	0.600	175.6	53.4
#50	0.300	219.9	41.6
#100	0.150	257.2	31.7
#200	0.075	291.1	22.7
PAN			

GRAVEL: **1 %**

SAND: **76 %**

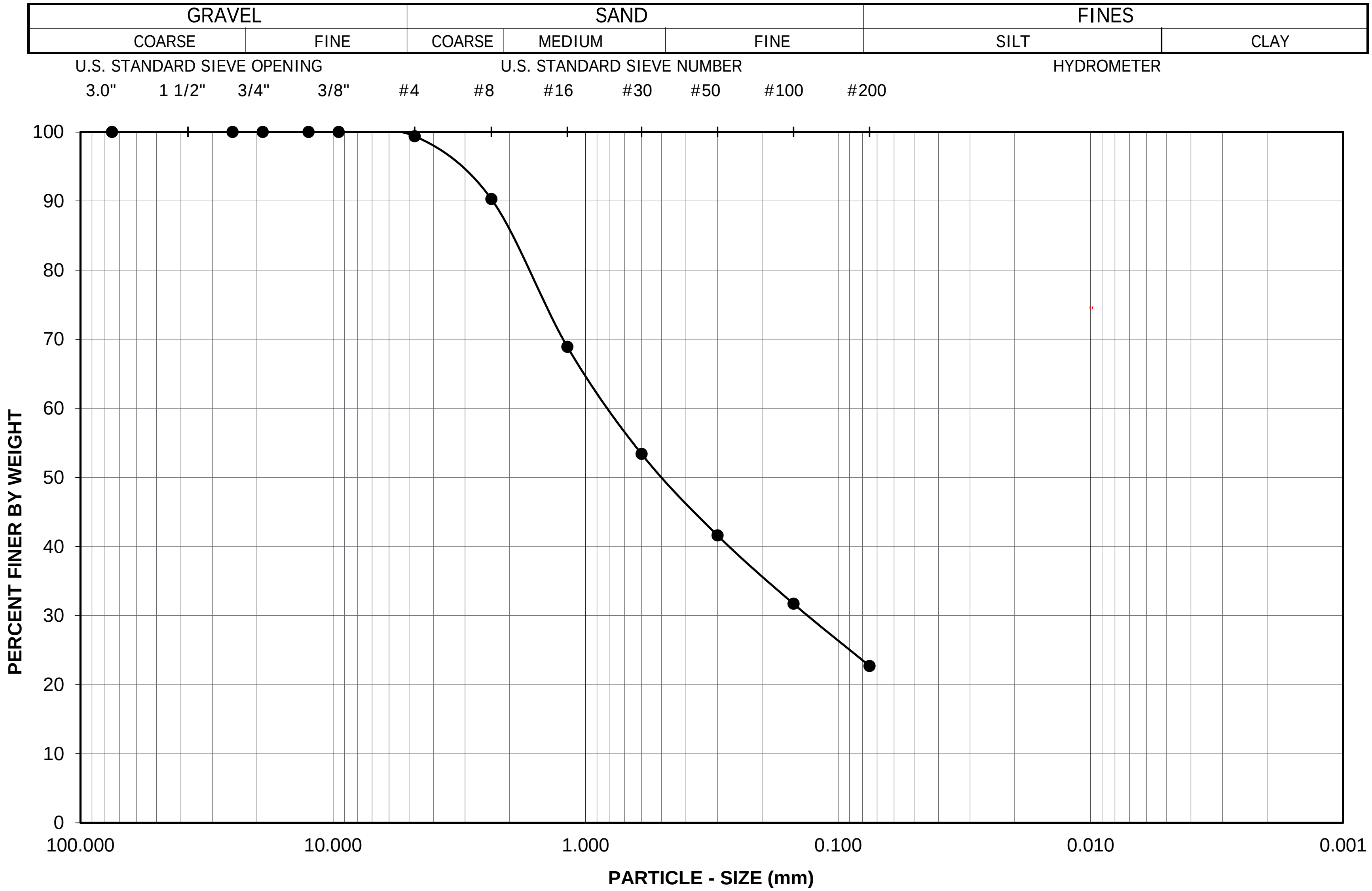
FINES: **23 %**

GROUP SYMBOL: **SM**

Cu = D60/D10 = N/A

Cc = $(D30)^2/(D60*D10)$ = N/A

Remarks:



Project Name: Good Hope/Olive Ave Storm Drain

Project No.: 10206.005

Boring No.: P-1 Sample No.: B-1

Depth (feet): 8.5 Soil Type : SM

Soil Identification: Silty Sand (SM), Yellowish Brown.

Leighton

PARTICLE - SIZE DISTRIBUTION ASTM D 6913

GR:SA:FI : (%) 1 : 76 : 23

Jun-22

SAND EQUIVALENT TEST

ASTM D 2419 / DOT CA Test 217

Project Name:	Good Hope/Olive Ave Storm Drain	Tested By:	M. Vinet	Date:	4/20/22
Project No. :	10206.005	Computed By:	M. Vinet	Date:	4/20/22
Client:	RCFC & WCD	Checked By:	M. Vinet	Date:	4/26/22

Boring No.	Sample No.	Depth (ft.)	Soil Description	T1	T2	T3	T4	R1	R2	SE	Average SE
LB-6	B-1	5.0 - 10.0	Silty Sand (SM)	11:45	11:55	11:57	12:17	11.3	2.2	20	**20**
				11:47	11:57	11:59	12:19	11.3	2.1	19	

T1 = Starting Time

T2 = (T1 + 10 min) Begin Agitation

T3 = Settlement Starting Time

T4 = (T3 + 20 min) Take Clay Reading (R1)

Sand Equivalent = R2 / R1 * 100

Record SE as Next Higher Integer

SAND EQUIVALENT TEST

ASTM D 2419 / DOT CA Test 217

Project Name:	Good Hope/Olive Ave Storm Drain	Tested By:	M. Vinet	Date:	6/7/22
Project No. :	10206.005	Computed By:	M. Vinet	Date:	6/7/22
Client:	RCFC & WCD	Checked By:	M. Vinet	Date:	6/8/22

Boring No.	Sample No.	Depth (ft.)	Soil Description	T1	T2	T3	T4	R1	R2	SE	Average SE
LB-12	B-1	0 - 5.0	Silty Sand (SM)	09:45	09:55	09:57	10:17	11.2	2.6	24	**25**
				09:47	09:57	09:59	10:19	10.7	2.6	25	

T1 = Starting Time

T2 = (T1 + 10 min) Begin Agitation

T3 = Settlement Starting Time

T4 = (T3 + 20 min) Take Clay Reading (R1)

Sand Equivalent = R2 / R1 * 100

Record SE as Next Higher Integer

Leighton

TESTS for SULFATE CONTENT CHLORIDE CONTENT and pH of SOILS

Project Name: Good Hope/Olive Ave Storm Drain   Tested By : M. Vinet   Date: 04/20/22

Project No. : 10206.005   Data Input By: M. Vinet   Date: 04/26/22

Boring No.	LB-6			
Sample No.	B-1			
Sample Depth (ft)	5.0 - 10.0			
Soil Identification:	Silty Sand (SM)			
Wet Weight of Soil + Container (g)	100.00			
Dry Weight of Soil + Container (g)	100.00			
Weight of Container (g)	0.00			
Moisture Content (%)	0.00			
Weight of Soaked Soil (g)	100.00			

SULFATE CONTENT, DOT California Test 417, Part II

Beaker No.	1			
Crucible No.	1			
Furnace Temperature (°C)	850			
Time In / Time Out	Timer			
Duration of Combustion (min)	45			
Wt. of Crucible + Residue (g)	25.0418			
Wt. of Crucible (g)	25.0360			
Wt. of Residue (g) (A)	0.0058			
PPM of Sulfate (A) x 41150	238.67			
PPM of Sulfate, Dry Weight Basis	**239**			

CHLORIDE CONTENT, DOT California Test 422

ml of Extract For Titration (B)	30			
ml of $AgNO_3$ Soln. Used in Titration (C)	1.2			
PPM of Chloride (C -0.2) * 100 * 30 / B	100			
PPM of Chloride, Dry Wt. Basis	**100**			

pH TEST, DOT California Test 643

pH Value	**7.70**			
Temperature °C	21.0			

SOIL RESISTIVITY TEST

DOT CA TEST 643

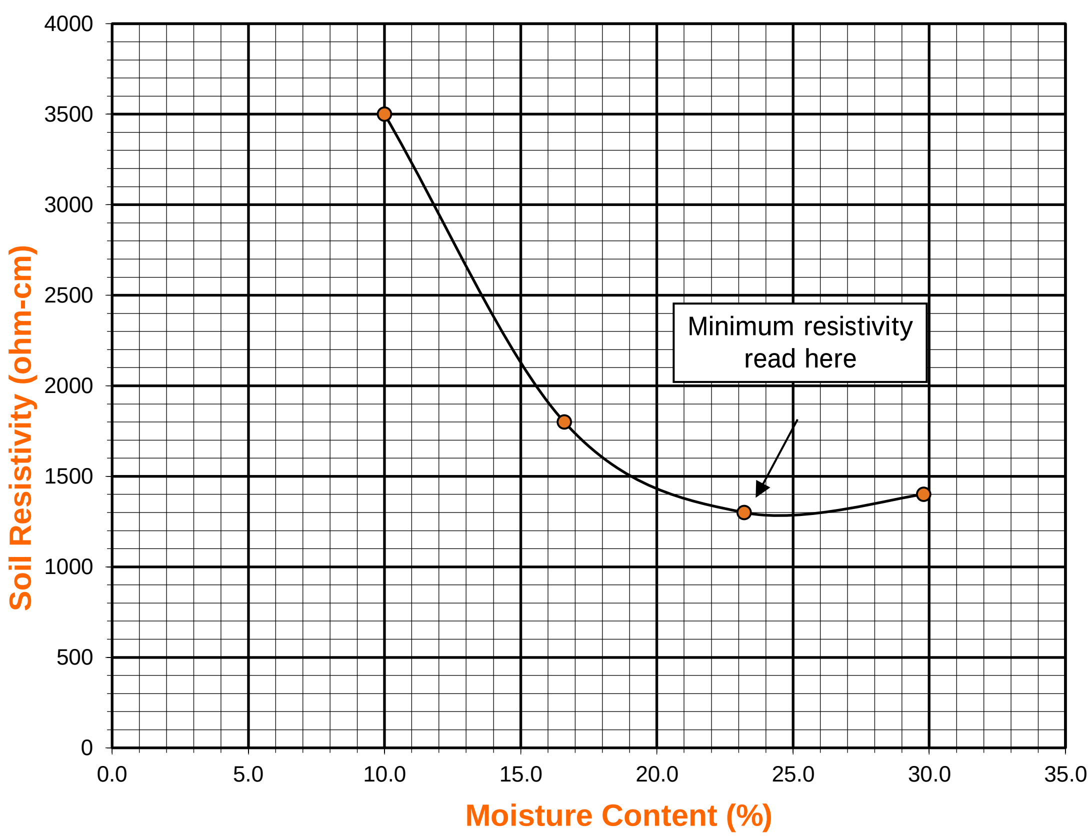
Project Name:	Good Hope/Olive Ave Storm Drain	Tested By :	M. Vinet Date: 04/20/22
Project No. :	10206.005	Data Input By:	M. Vinet Date: 04/26/22
Boring No.:	LB-6	Depth (ft.) :	5.0 - 10.0
Sample No. :	B-1		
Soil Identification:*	Silty Sand (SM)		

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	50	10.00	3500	3500
2	83	16.60	1800	1800
3	116	23.20	1300	1300
4	149	29.80	1400	1400
5				

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	100.00
Dry Wt. of Soil + Cont. (g)	100.00
Wt. of Container (g)	0.00
Container No.	A
Initial Soil Wt. (g) (Wt)	500.00
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
1300	**23.2**	**239**	**100**	**7.70**	**21.0**



TESTS for SULFATE CONTENT

Project Name:	Good Hope/Olive Ave Storm Drain	Tested By :	M. Vinet	Date: 04/20/22
Project No. :	10206.005	Data Input By:	M. Vinet	Date: 04/26/22

Boring No.	LB-1			
Sample No.	B-1			
Sample Depth (ft)	5.0 - 10.0			
Soil Identification:	Silty Sand with Gravel (SM)g			
Wet Weight of Soil + Container (g)	100.00			
Dry Weight of Soil + Container (g)	100.00			
Weight of Container (g)	0.00			
Moisture Content (%)	0.00			
Weight of Soaked Soil (g)	100.00			

SULFATE CONTENT, DOT California Test 417, Part II

Beaker No.	1			
Crucible No.	1			
Furnace Temperature (°C)	850			
Time In / Time Out	Timer			
Duration of Combustion (min)	45			
Wt. of Crucible + Residue (g)	25.0425			
Wt. of Crucible (g)	25.0362			
Wt. of Residue (g) (A)	0.0063			
PPM of Sulfate (A) x 41150	259.24			
PPM of Sulfate, Dry Weight Basis	**259**			

TESTS for SULFATE CONTENT

Project Name: Good Hope/Olive Ave Storm Drain
Tested By : M. Vinet Date: 06/08/22

Project No. : 10206.005
Data Input By: M. Vinet Date: 06/08/22

Boring No.	LB-17			
Sample No.	B-1			
Sample Depth (ft)	0 - 5.0			
Soil Identification:	Silty Sand (SM)			
Wet Weight of Soil + Container (g)	100.00			
Dry Weight of Soil + Container (g)	100.00			
Weight of Container (g)	0.00			
Moisture Content (%)	0.00			
Weight of Soaked Soil (g)	100.00			

SULFATE CONTENT, DOT California Test 417, Part II

Beaker No.	1			
Crucible No.	1			
Furnace Temperature (°C)	850			
Time In / Time Out	Timer			
Duration of Combustion (min)	45			
Wt. of Crucible + Residue (g)	25.0405			
Wt. of Crucible (g)	25.0364			
Wt. of Residue (g) (A)	0.0041			
PPM of Sulfate (A) x 41150	168.72			
PPM of Sulfate, Dry Weight Basis	**169**			

APPENDIX C

Seismic Refraction Survey

SEISMIC REFRACTION SURVEY

GOOD HOPE – OLIVE AVENUE STORM DRAIN, STAGES 1 AND 2

RIVERSIDE COUNTY FLOOD CONTROL AND
WATER CONSERVATION DISTRICT

Unincorporated Riverside County, California

PREPARED FOR:

Mr. Jeffrey T. DeLand
Leighton
41715 Enterprise Circle North, Suite 103
Temecula, CA 92590

PREPARED BY:

Atlas Technical Consultants LLC
6280 Riverdale Street
San Diego, CA 92120

March 6, 2023

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

March 6, 2023

Atlas No. 8783

MR. JEFFREY T. DELAND
LEIGHTON
41715 ENTERPRISE CIRCLE NORTH, SUITE 103
TEMECULA, CA 92590

Subject: Seismic Refraction Survey
Riverside County Flood Control and Water Conservation District
Good Hope – Olive Avenue Storm Drain, Stages 1 and 2
Unincorporated Riverside County, California

Dear Mr. DeLand:

In accordance with your authorization, Atlas has performed a seismic refraction study pertaining to the subject project located in Riverside County, California. Specifically, our evaluation consisted of performing fourteen seismic P-wave refraction traverses at preselected locations. The purpose of our evaluation was to develop subsurface velocity profiles of the study areas in order to assess the depth to bedrock and apparent rippability of the subsurface materials. Our field services were conducted on January 31st through February 2nd, 2022. This data report presents our methodology, equipment used, analysis, and results.

We appreciate the opportunity to be of service on this project. Should you have any questions related to this report, please contact the undersigned at your convenience.

Respectfully submitted,
Atlas Technical Consultants LLC

REGISTERED PROFESSIONAL GEOPHYSICIST
PATRICK F. LEHRMANN
No. 1043
Exp. 1/31/2024
STATE OF CALIFORNIA

Paul W. Gresoro	Patrick F. Lehrmann, P.G., P.Gp. 1043
Senior Staff Geophysicist	Principal Geologist/Geophysicist

PWG:SGM:SL:PFL:ds

Distribution: JdeLand@leightongroup.com

CONTENTS

TABLE

FIGURES

1. INTRODUCTION

In accordance with your authorization, Atlas has performed a seismic refraction study pertaining to the subject project located in Riverside County, California (Figure 1). Specifically, our evaluation consisted of performing fourteen seismic P-wave refraction traverses at preselected locations. The purpose of our evaluation was to develop subsurface velocity profiles of the study areas in order to assess the depth to bedrock and apparent rippability of the subsurface materials. Our field services were conducted on January 31st through February 2nd, 2022. This data report presents our methodology, equipment used, analysis, and results.

2. SCOPE OF SERVICES

Our scope of services included:

- Performance of fourteen seismic P-wave refraction traverses at the project site.
- Compilation and analysis of the data collected.
- Preparation of this data report presenting our results and conclusions.

3. SITE AND PROJECT DESCRIPTION

The project sites were located within a residential area approximately 0.5 to 1.0 mile west of Highway 74 in Perris, California (Figure 1). The seismic traverses were conducted in study area locations selected by a representative from your office. The traverses were conducted in areas of minimal topographic relief. Figures 2a through 2d and Figures 3a through 3d show the seismic line locations and depict the general site conditions, respectively. Based on our discussions with you, it is our understanding that your office requested this study in advance of trenching activities for proposed storm drain alignments for the subject project. We also understand that the results of our study may be used in the formulation of design and construction parameters for the project.

4. STUDY METHODOLOGY

Fourteen seismic P-wave (compression wave) refraction studies were conducted at the project sites to develop subsurface velocity profiles of the areas studied, and to assess the depth to bedrock and apparent rippability of the subsurface materials. The seismic refraction method uses first-arrival times of refracted seismic waves to estimate the thicknesses and seismic velocities of subsurface layers. Seismic P-waves generated at the surface, using a hammer and plate, are refracted at boundaries separating materials of contrasting velocities. These refracted seismic waves are then detected by a series of surface vertical component 14-Hz geophones and recorded with a 24-channel Geometrics Geode seismograph. The travel times of the seismic P-waves are used in conjunction with the shot-to-geophone distances to obtain thickness and velocity information on the subsurface materials.

Geophones were placed at intervals of 5 feet for SL-1 through SL-14. Profile lengths include the two innermost off-end shots for total profile lengths of 125 feet. The general locations and lengths of the lines were determined by surface conditions, site access, depth of investigation, and you and your office. Shot points (signal-generation locations) were conducted along the lines at the ends, midpoint, and intermediate points between the ends of the midpoint.

In general, classical seismic refraction theory requires that subsurface velocities increase with depth (generalized reciprocal method (GRM) and time-intercept modeling). In classical analysis methods, a layer having a velocity lower than that of the layer above will not generally be detectable by the seismic refraction method and could lead to errors in the depth calculations of subsequent layers. In addition, lateral variations in velocity such as those caused by core stones, intrusions, or boulders can also result in the misinterpretation of the subsurface conditions. However, application of seismic tomography methods, as was performed for this project by Atlas, produces velocity models which, in general, are not subject to this limitation. Even the application of seismic tomography analysis does have certain limitations regarding vertical and horizontal resolution. When a velocity anomaly target is of similar scale length to the seismic wavelet (or smaller), then diffraction behavior dominates because scattering is governing the loci of the wavefronts. For travel time analysis a target feature must be at a scale versus its depth that is detectable relative to the scale length of the seismic wavelet we produce and receive. There is a general limit to what scale of feature seismic tomography methods can detect regarding relatively small velocity anomaly features, related to both source and to medium velocities, and travel time uncertainties. In effect, some relatively smaller scale features including "thin" velocity inversion layers or voids, and some types of lateral and vertical velocity variations caused by core stones and intrusions might not be detected in our results. In general, the effective depth of evaluation for a seismic refraction traverse is approximately one third to one-fifth of the length of the spread.

Generally, the seismic P-wave velocity of a material can be correlated to rippability (see Table 1 below), or to some degree "hardness." Table 1 is based on published information from the Caterpillar Performance Handbook (Caterpillar, 2018), as well as our experience with similar materials, and assumes that a Caterpillar D-9 dozer ripping with a single shank is used. We emphasize that the cutoffs in this classification scheme are approximate and that rock characteristic, such as fracture spacing and orientation, play a significant role in determining rock quality or rippability. The rippability of a mass is also dependent on the excavation equipment used and the skill and experience of the equipment operator.

For trenching operations, the rippability values should be scaled downward. For example, velocities as low as 3,500 feet/second may indicate difficult ripping during trenching operations. In addition, the presence of boulders, which can be troublesome in narrow trenching operations, should be anticipated.

Table 1 – Rippability Classification

Seismic P-wave Velocity	Rippability
0 to 2,000 feet/second	Easy
2,000 to 4,000 feet/second	Moderate
4,000 to 5,500 feet/second	Difficult, Possible Blasting
5,500 to 7,000 feet/second	Very Difficult, Probable Blasting
Greater than 7,000 feet/second	Blasting Generally Required

It should be noted that the rippability cutoffs presented in Table 1 are slightly more conservative than those published in the Caterpillar Performance Handbook. Accordingly, the above classification scheme should be used with discretion, and contractors should not be relieved of making their own independent evaluation of the rippability of the on-site materials prior to submitting their bids.

5. DATA ANALYSIS

The collected data were processed using SIPwin (Rimrock Geophysics, 2003), a seismic interpretation program, and analyzed using Rayfract® Version 4.02 (Intelligent Resources Inc., 2022) which employs wave path analysis. Rayfract first provides forward modeling of refraction, transmission, and diffraction and then back-projects travel-time residuals along wave paths also known as Fresnel volumes instead of conventional analysis by rays. This increases the numerical robustness of the inversion. A smooth minimum-structure one dimensional (1-D) starting velocity-depth profile model is determined automatically directly from the seismic travel-time data first arrival picks and elevation data to produce subsurface velocities by horizontally averaging via the Delta t-V method. The Delta t-V method is based on common mid-point sorted travel times and assumes multiple horizontal layers with constant interior velocity gradients (Rohdewald 2007; Gebrande 1985). Modeled seismic rays follow circular arcs inside each modeled layer. The Delta t-V starting model is then refined with 2-D Wavepath Eikonal Traveltime (WET) inversion method (Schuster, 1993). The resulting 2-D WET velocity model provides a 2-D tomographic image of the P-wave velocities which can be used to estimate subsurface geologic conditions. Both vertical and lateral velocity information is contained in the tomography model. Changes in layer velocity are generally revealed as gradients rather than discrete contacts, which typically are more representative of actual conditions.

6. RESULTS AND CONCLUSIONS

As previously indicated, fourteen seismic traverses were conducted as part of our study and Figures 4a through 4n present the velocity models generated from our analysis. Based on the results, it appears that the study area is generally underlain by low velocity materials in the near subsurface and higher velocity material at depth. Distinct vertical and lateral velocity variations are evident in the models. Moreover, the degree of bedrock weathering and the depth to bedrock appears to be highly variable across the study areas. In addition, remnant boulders appear to be present in the subsurface in some areas.

Based on the refraction results, variability in the excavatability (including depth of rippability) of the subsurface materials may be expected across the project area. Furthermore, blasting may be required depending on the excavation, depth, location, equipment used, and desired rate of production. In addition, oversized materials should be expected. A contractor with excavation experience in similarly difficult conditions should be consulted for expert advice on excavation methodology, equipment, and production rate.

7. LIMITATIONS

The field evaluation and geophysical analyses presented in this report have been conducted in general accordance with current practice and the standard of care exercised by consultants performing similar tasks in the project area. No warranty, express or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be present. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface surveying will be performed upon request.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Atlas should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document. This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

8. SELECTED REFERENCES

Caterpillar, Inc., 2018, Caterpillar Performance Handbook, Edition 48, Caterpillar, Inc., Peoria, Illinois.

Gebrande H. and Miller H., 1985, Refraktionsseismik (in German). In: F. Bender (Editor), Angewandte Geowissenschaften II. Ferdinand Enke, Stuttgart; pp. 226-260. ISBN 3-432-91021-5.

Intelligent Resources Inc., 2022, Seismic Refraction Interpretation and Modeling Program (Rayfract), V-3.36.

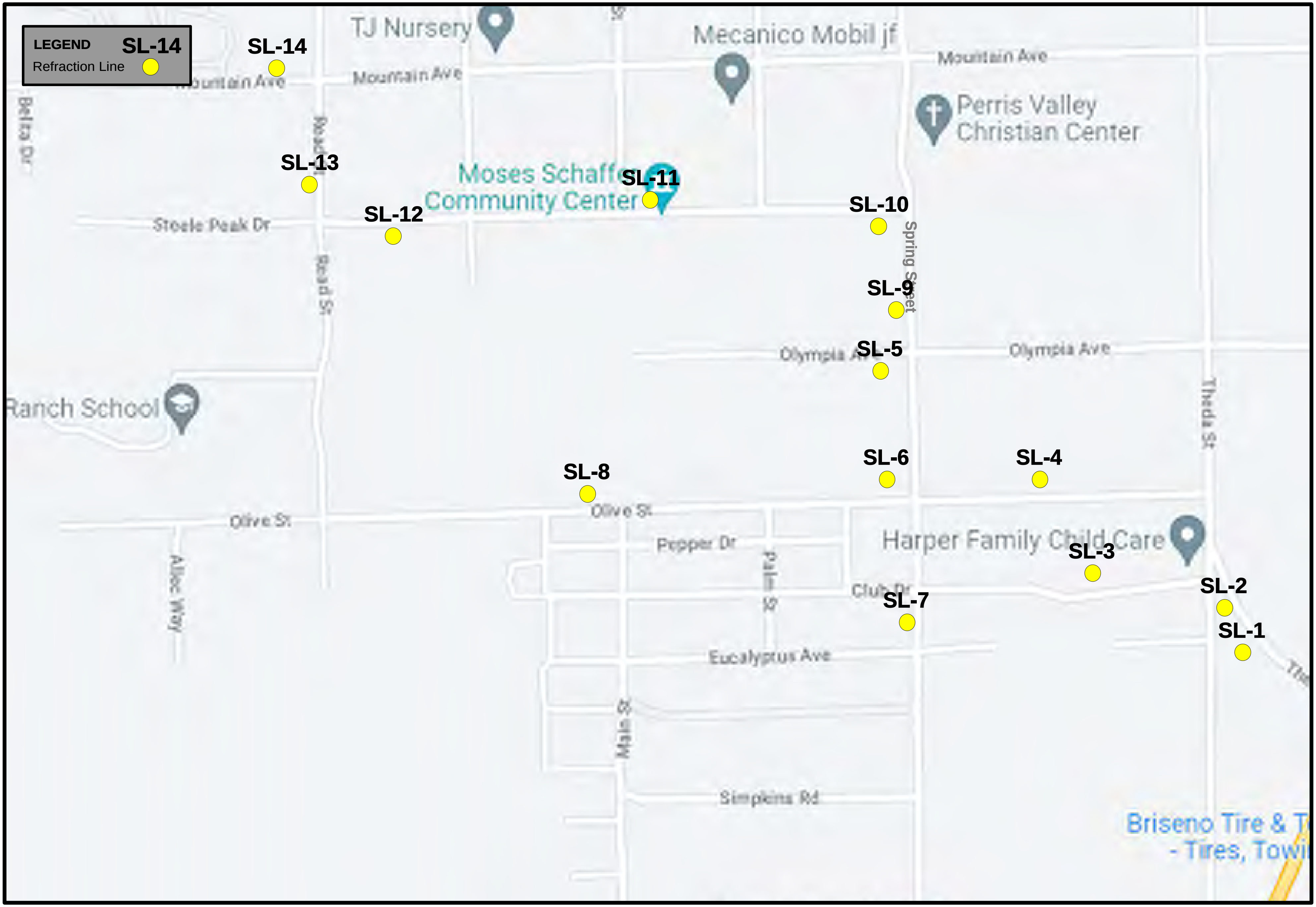
Mooney, H.M., 1976, Handbook of Engineering Geophysics, dated February.

Rimrock Geophysics, 2003, Seismic Refraction Interpretation Program (SIPwin), V-2.76

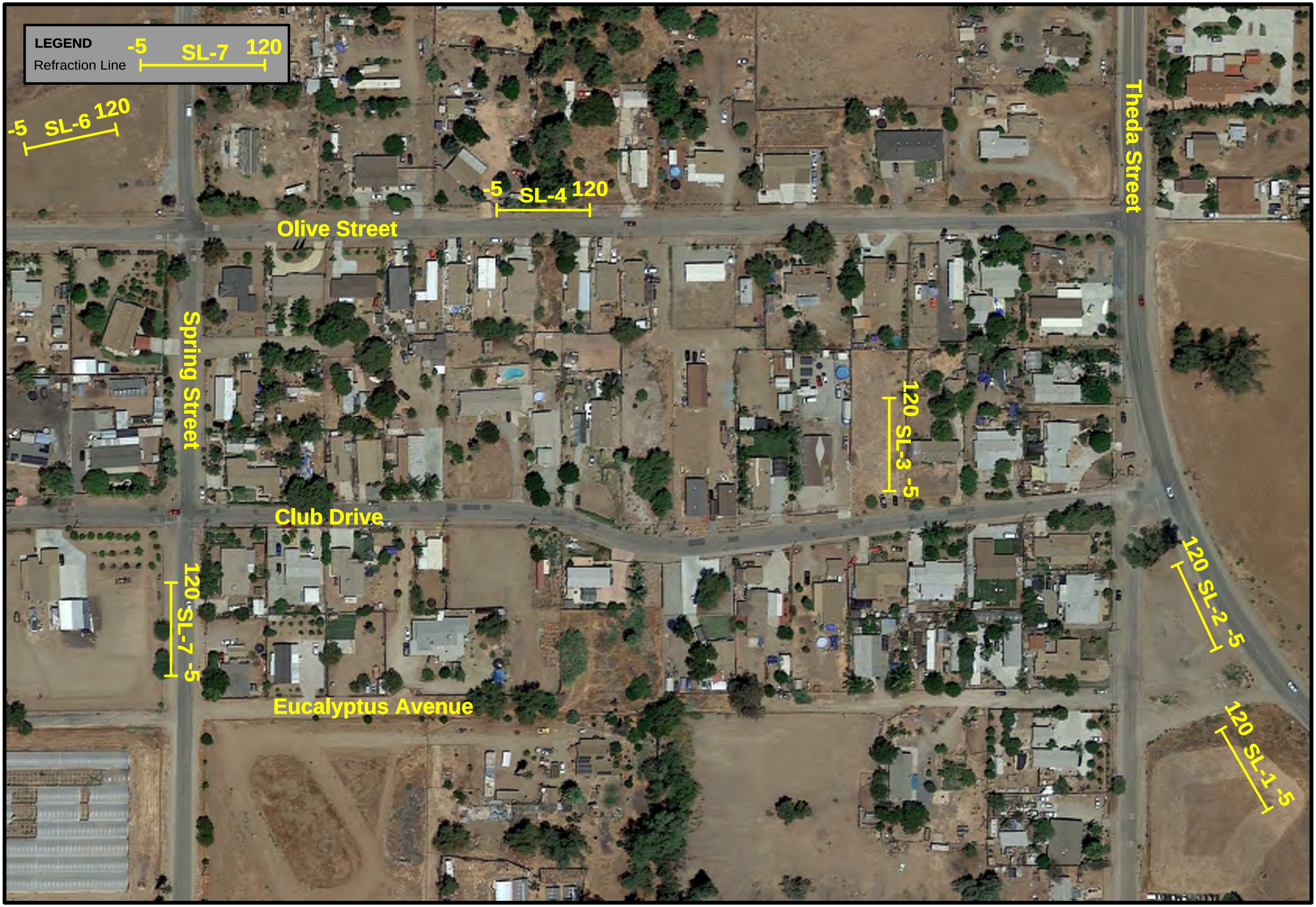
Rohdewald S., 2007, XTV Inversion. See http://rayfract.com/xtv_inversion.pdf

Schuster, G.T. and Quintus-Bosz, A., 1993, Wavepath eikonal traveltime inversion: Theory. Geophysics, 58(9), 1314-1323.

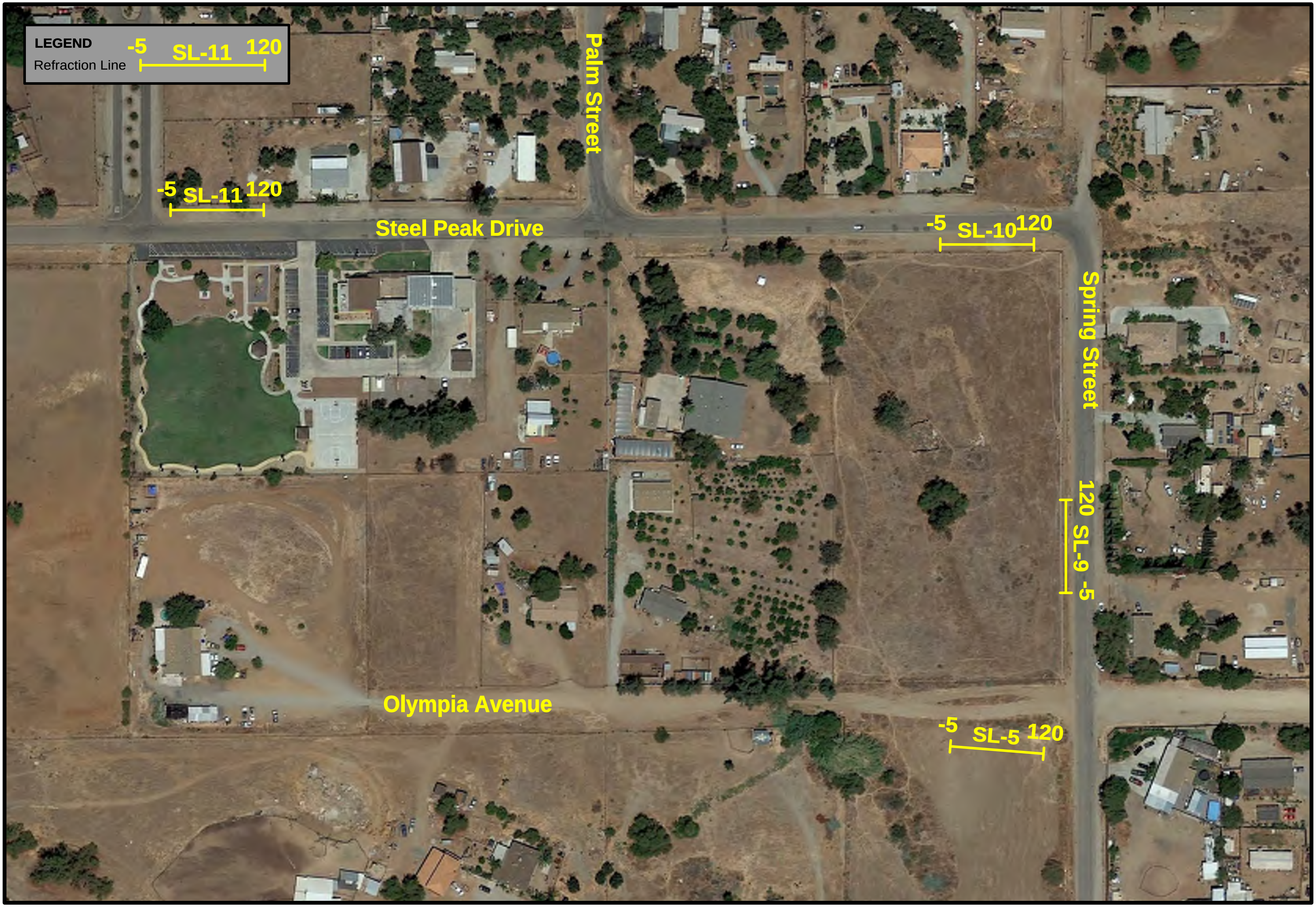
Telford, W.M., Geldart, L.P., Sheriff, R.E., and Keys, D.A., 1976, Applied Geophysics, Cambridge University Press.



SITE LOCATION MAP	N	Good Hope - Olive Avenue Storm Drain Riverside, California	ATLAS Figure 1
		Project No.: 8783.P6 Date: 02/23	



SEISMIC LINE LOCATION MAP **SL-1, SL-2, SL-3,** **SL-4, SL-6 and SL-7**	N	**Good Hope - Olive Avenue Storm Drain** **Riverside, California** Project No.: 8783.P6 Date: 02/23	ATLAS Figure 2a	**0 175 350** **approximate scale in feet**



SEISMIC LINE LOCATION MAP
SL-5, SL9, SL-10 and SL-11

N

Good Hope - Olive Avenue Storm Drain
Riverside, California

Project No.: 8783.P6 | Date: 02/23

ATLAS

Figure 2b

0 175 350

approximate scale in feet

SEISMIC LINE LOCATION MAP
SL-8

N

Good Hope - Olive Avenue Storm Drain
Riverside, California

Project No.: 8783.P6

Date: 02/23

ATLAS

Figure 2c

0 100 200

approximate scale in feet

SEISMIC LINE LOCATION MAP
SL-12, SL-13 and SL-14

N

Good Hope - Olive Avenue Storm Drain
Riverside, California

Project No.: 8783.P6

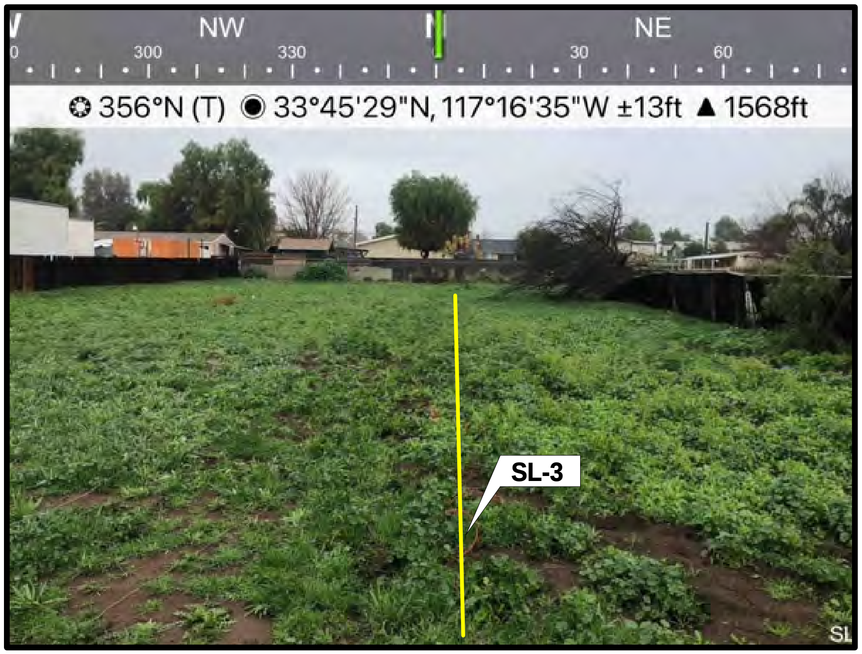
Date: 02/23

ATLAS

Figure 2d

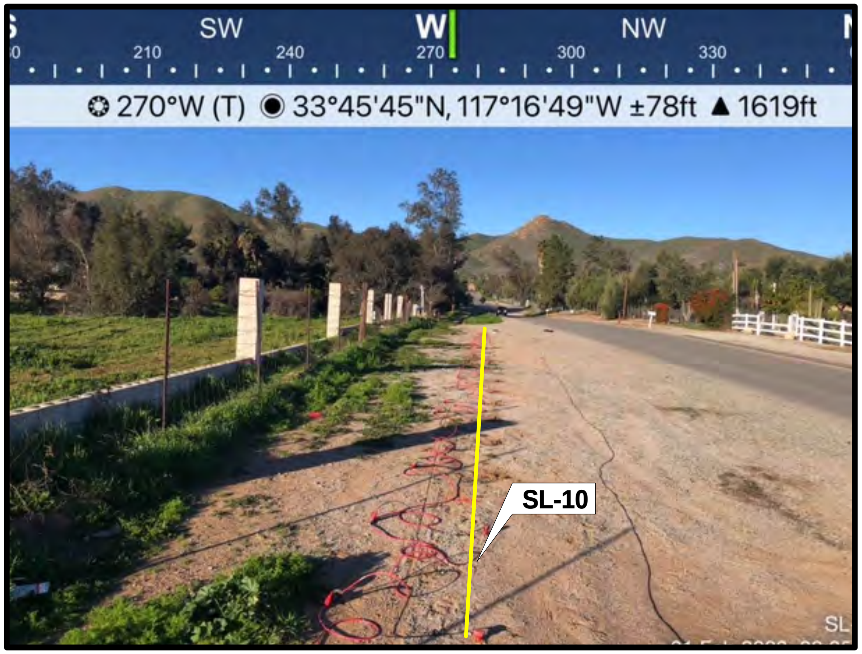
0 125 250

approximate scale in feet



SITE PHOTOGRAPHS SL-1, SL-2, SL-3 and SL-4	**Good Hope - Olive Avenue Storm Drain Riverside, California**	ATLAS
	Project No.: 8783.P6 / Date: 04/22	Figure 3a

SITE PHOTOGRAPHS **SL-5, SL-6, SL-7 and SL-8**	**Good Hope - Olive Avenue Storm Drain** **Riverside, California** Project No.: 8783.P6 — Date: 02/23	ATLAS Figure 3b

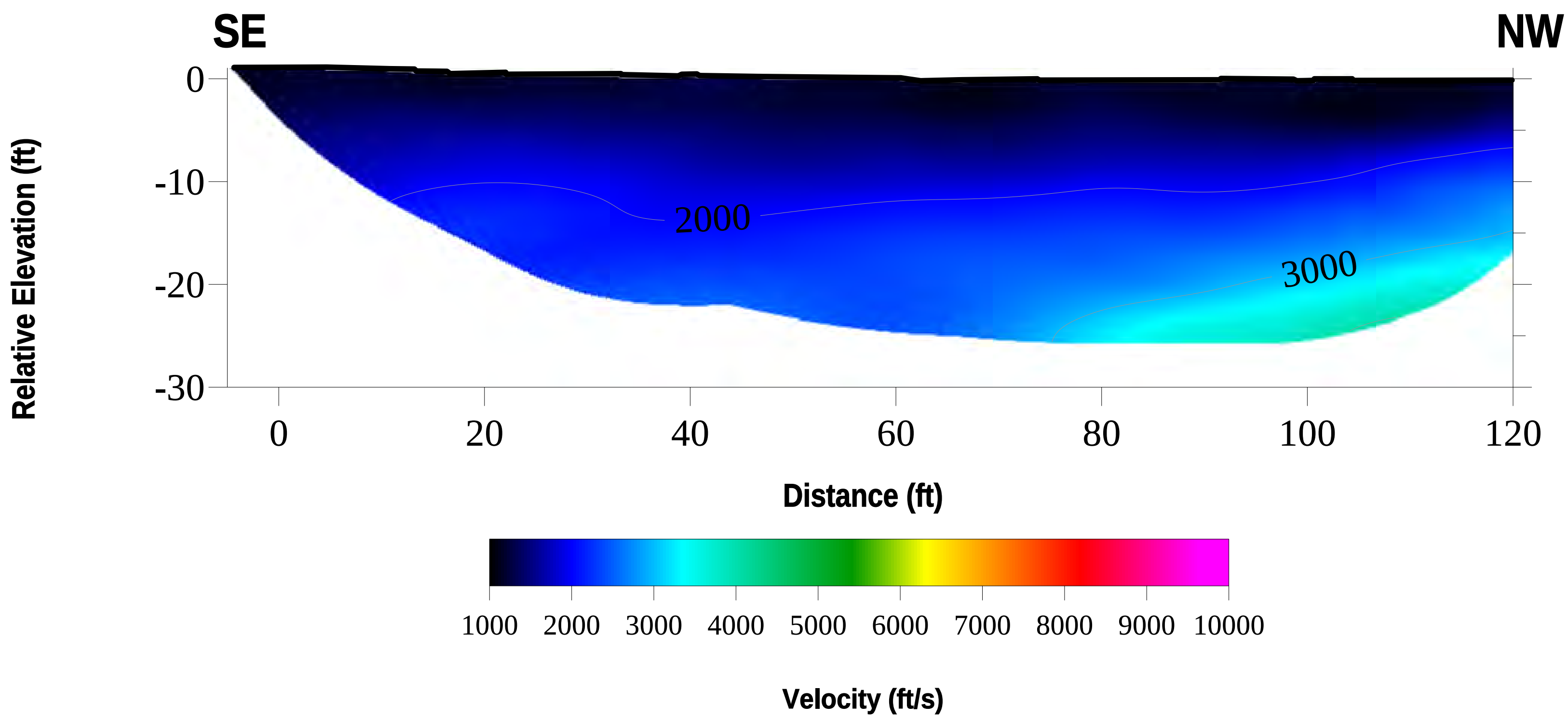


SITE PHOTOGRAPHS **SL-9, SL-10, SL-11 and SL-12**	**Good Hope - Olive Avenue Storm Drain** **Riverside, California** Project No.: 8783.P6 — Date: 02/23	ATLAS Figure 3c

SITE PHOTOGRAPHS **SL-13 and SL-14**	**Good Hope - Olive Avenue Storm Drain** **Riverside, California** Project No.: 8783.P6 Date: 02/23	ATLAS Figure 3d

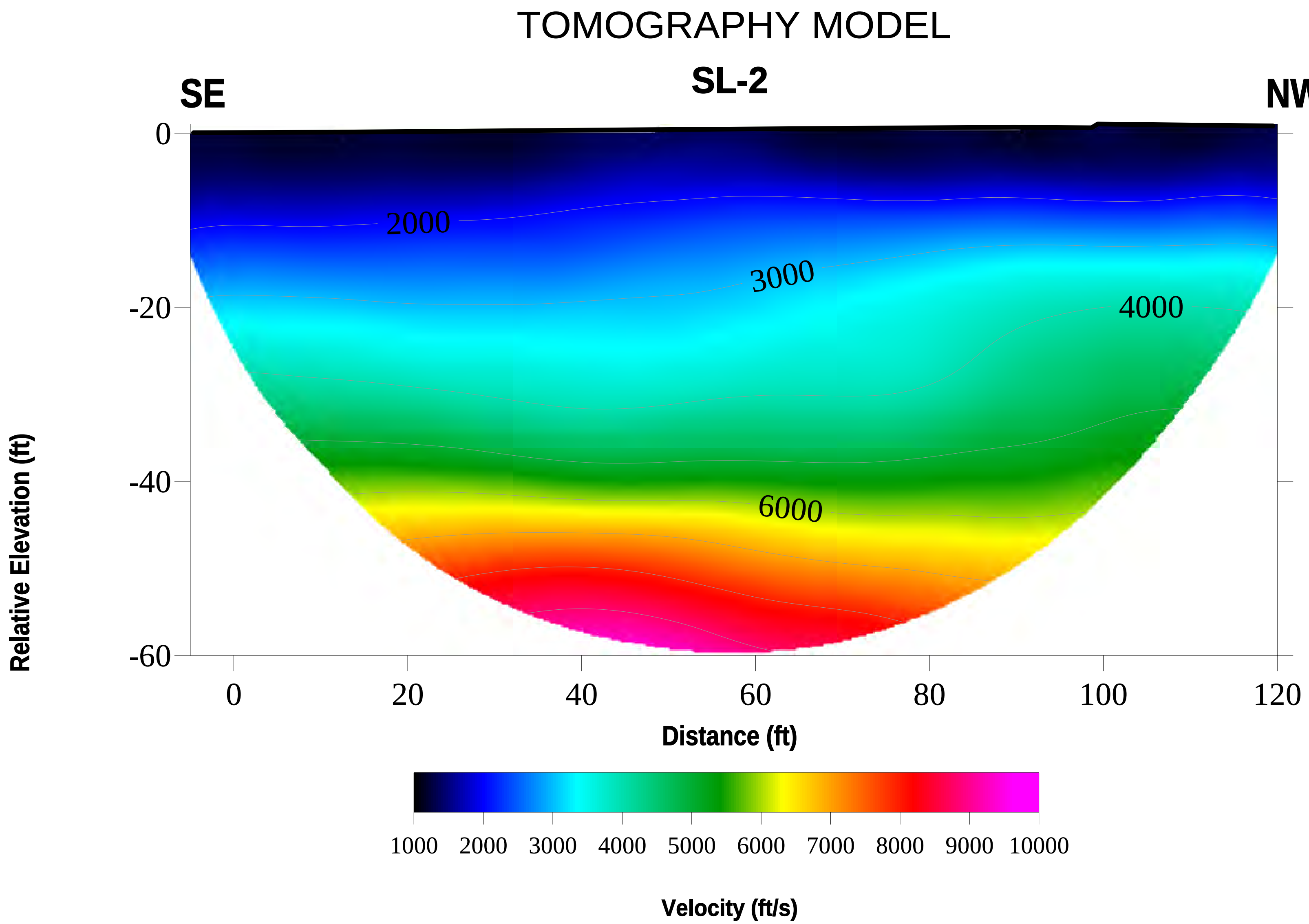
TOMOGRAPHY MODEL

SL-1



Note: Contour Interval = 1,000 feet per second

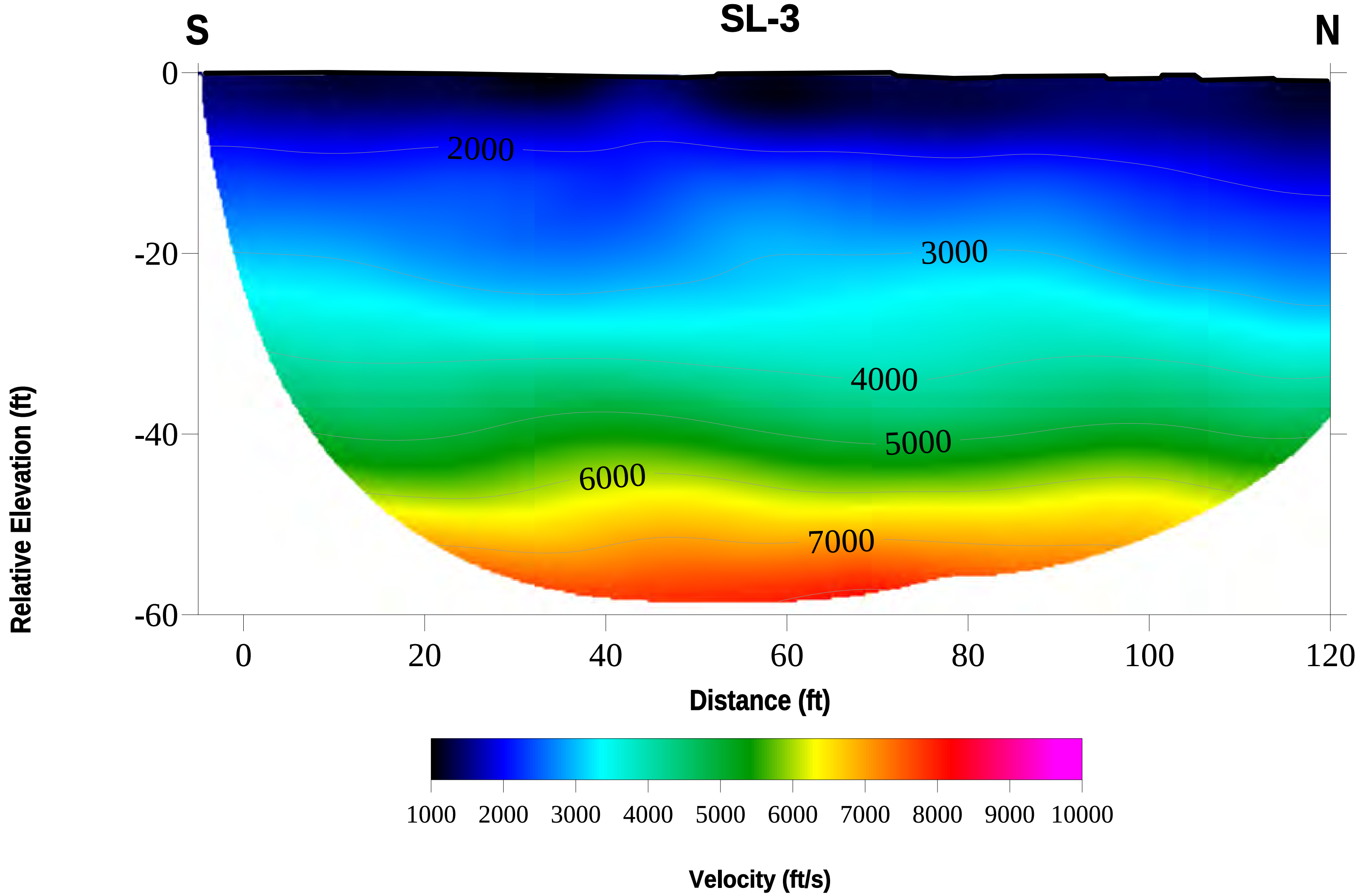
P-WAVE PROFILE SL-1	Good Hope - Olive Avenue Storm Drain Riverside, California		ATLAS Figure 4a
	Project No.: 8783.P6	Date: 03/23	



Note: Contour Interval = 1,000 feet per second

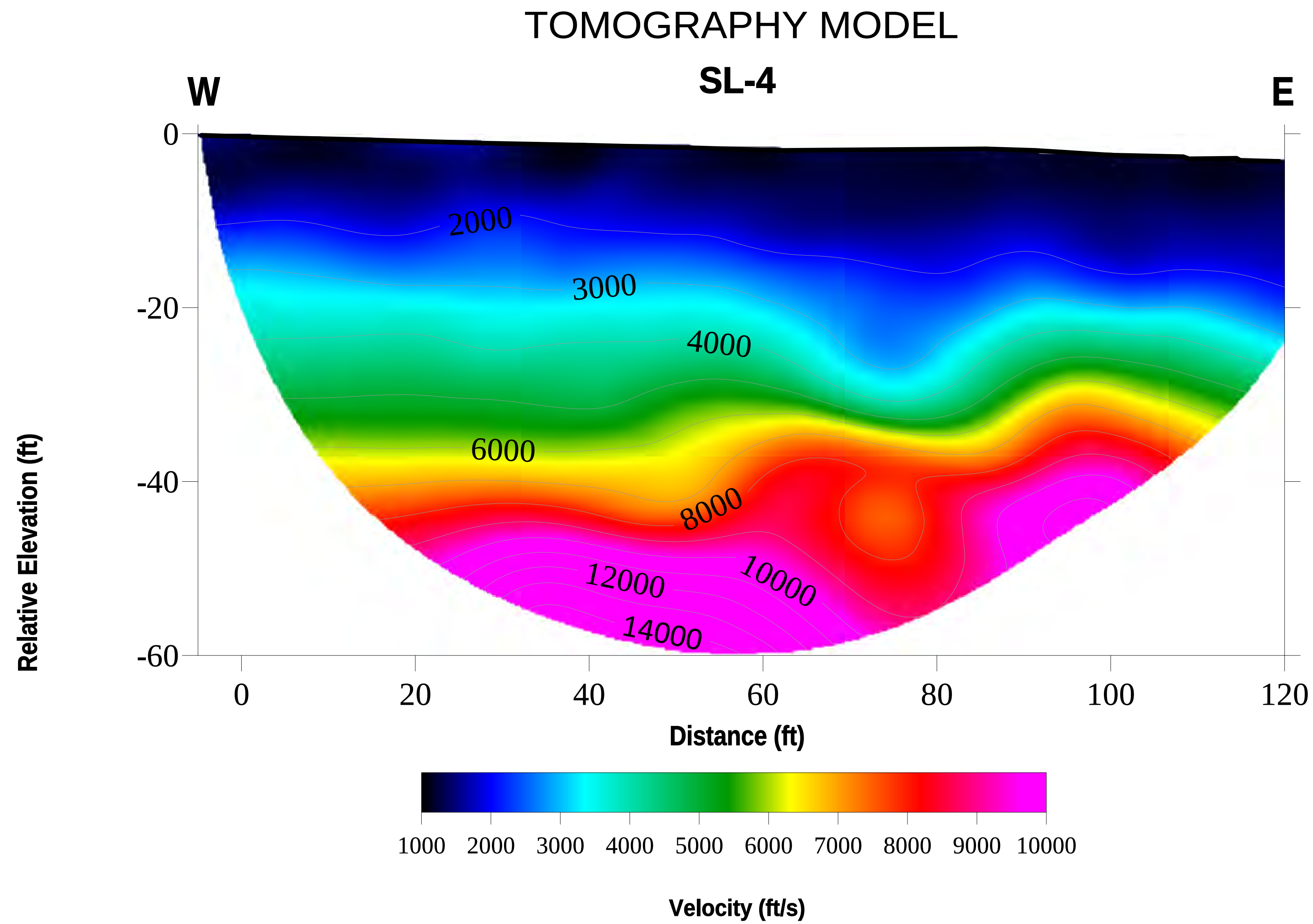
P-WAVE PROFILE SL-2	**Good Hope - Olive Avenue Storm Drain Riverside, California**	ATLAS
	Project No.: 8783.P6 / Date: 03/23	Figure 4b

TOMOGRAPHY MODEL



Note: Contour Interval = 1,000 feet per second

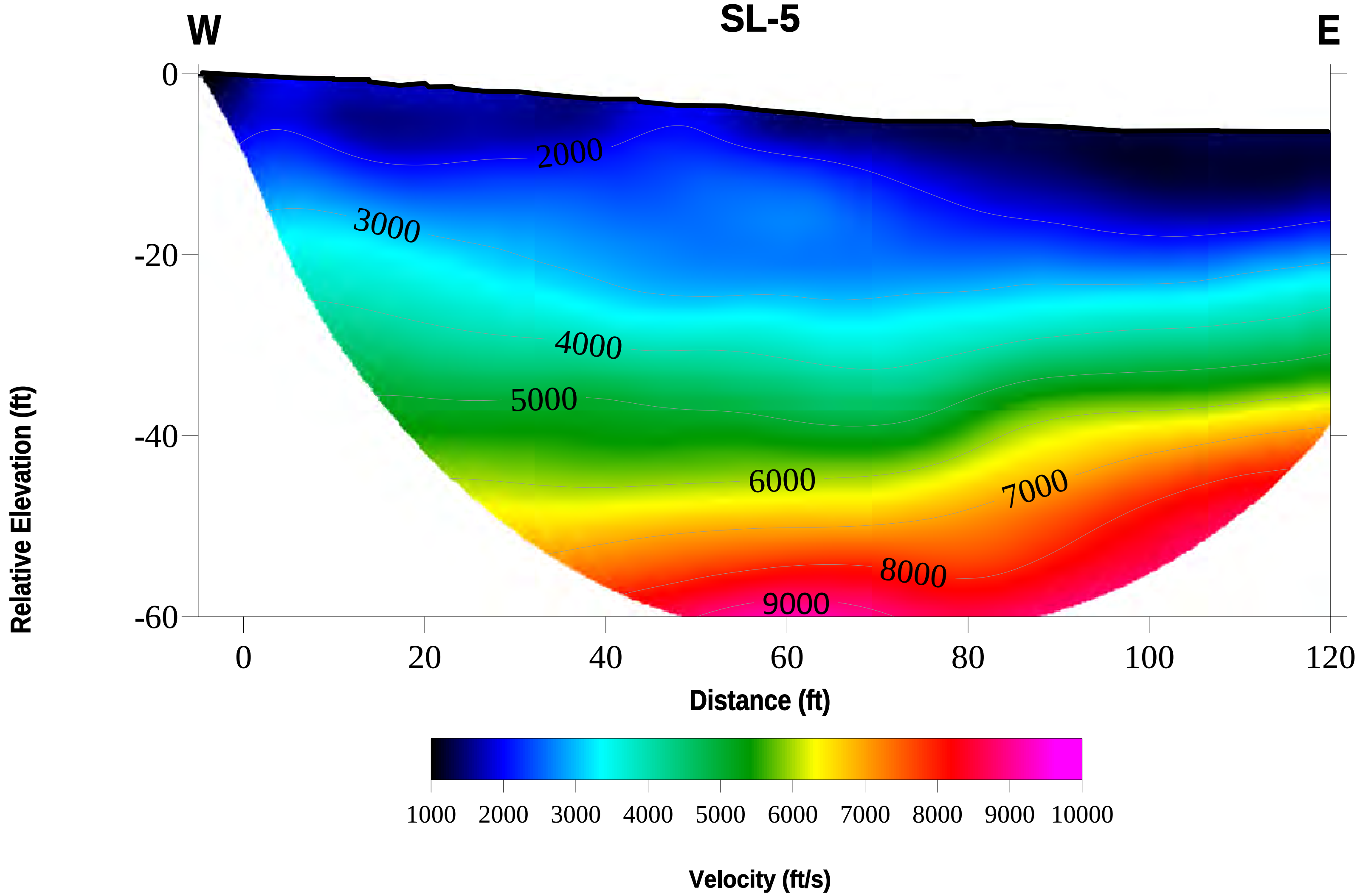
P-WAVE PROFILE SL-3	**Good Hope - Olive Avenue Storm Drain Riverside, California**	ATLAS Figure 4c
	Project No.: 8783.P6 / Date: 03/23	



Note: Contour Interval = 1,000 feet per second

P-WAVE PROFILE SL-4	Good Hope - Olive Avenue Storm Drain Riverside, California Project No.: 8783.P6 / Date: 03/23	ATLAS Figure 4d

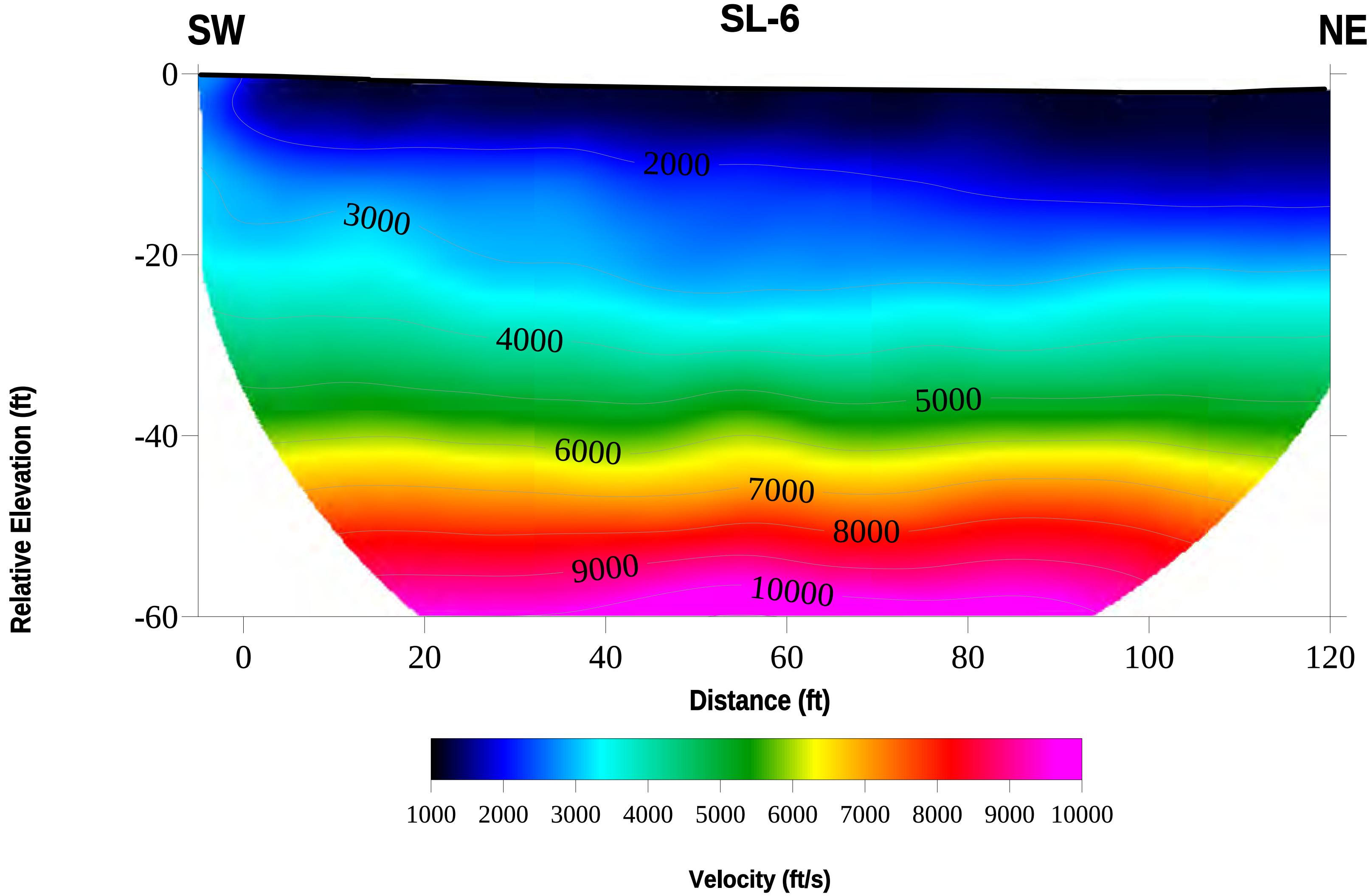
TOMOGRAPHY MODEL



Note: Contour Interval = 1,000 feet per second

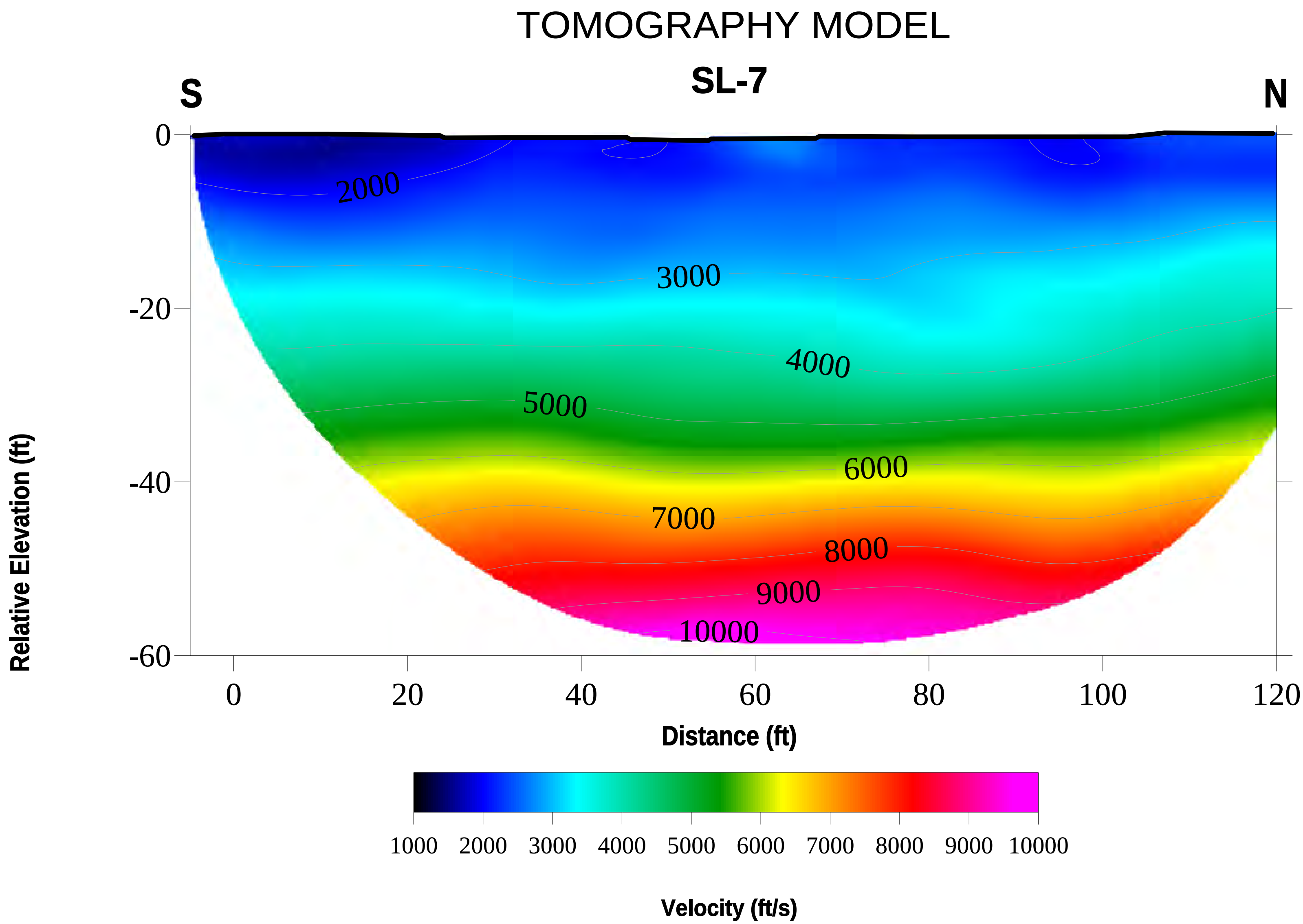
P-WAVE PROFILE SL-5	Good Hope - Olive Avenue Storm Drain Riverside, California		ATLAS Figure 4e
	Project No.: 8783.P6	Date: 03/23	

TOMOGRAPHY MODEL



Note: Contour Interval = 1,000 feet per second

P-WAVE PROFILE SL-6	**Good Hope - Olive Avenue Storm Drain Riverside, California**		ATLAS Figure 4f
	Project No.: 8783.P6	Date: 03/23	

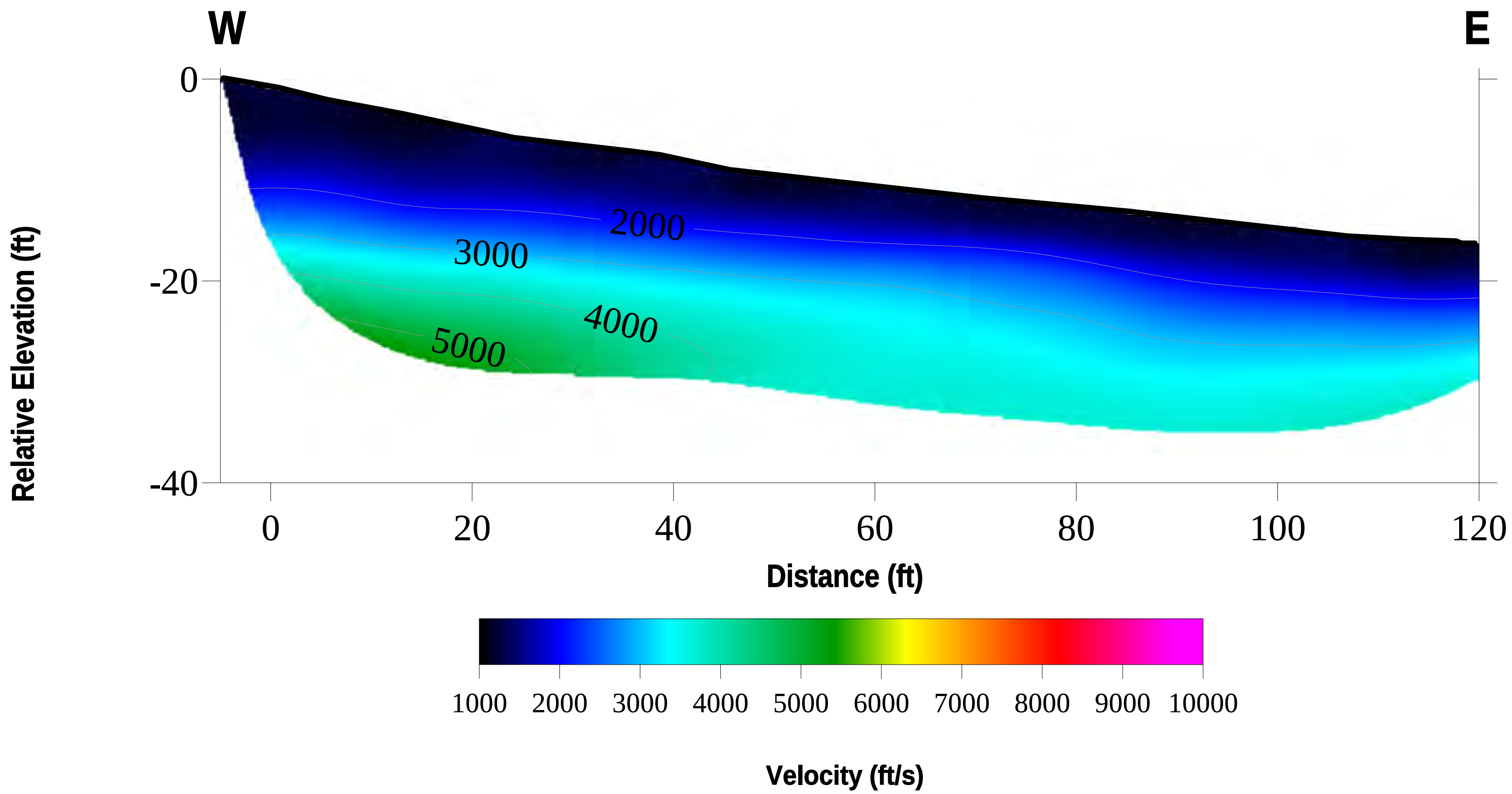


P-WAVE PROFILE SL-7	Good Hope - Olive Avenue Storm Drain Riverside, California	ATLAS Figure 4g
	Project No.: 8783.P6 — Date: 03/23	

Note: Contour Interval = 1,000 feet per second

TOMOGRAPHY MODEL

SL-8

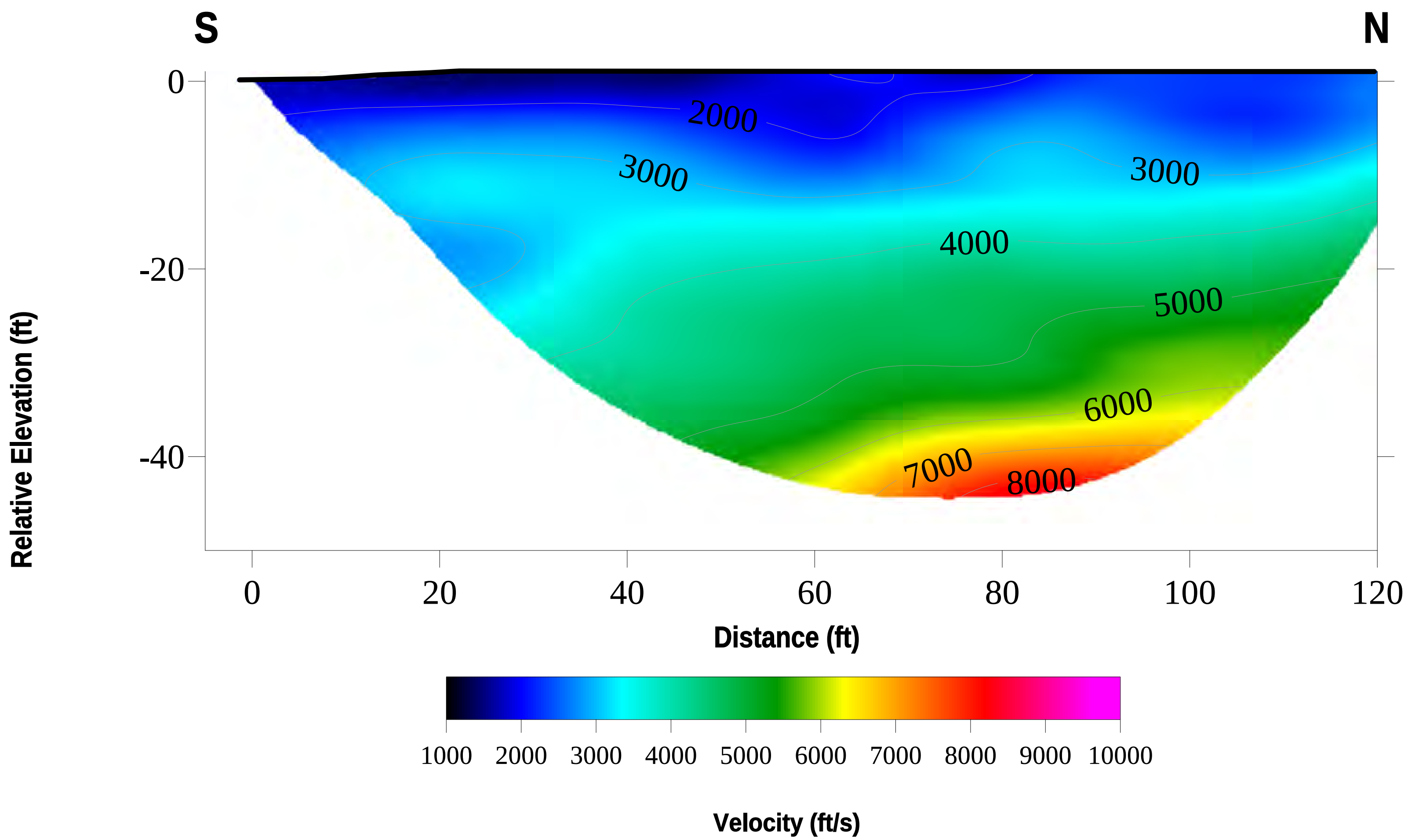


Note: Contour Interval = 1,000 feet per second

P-WAVE PROFILE SL-8	Good Hope - Olive Avenue Storm Drain Riverside, California		ATLAS Figure 4h
	Project No.: 8783.P6	Date: 03/23	

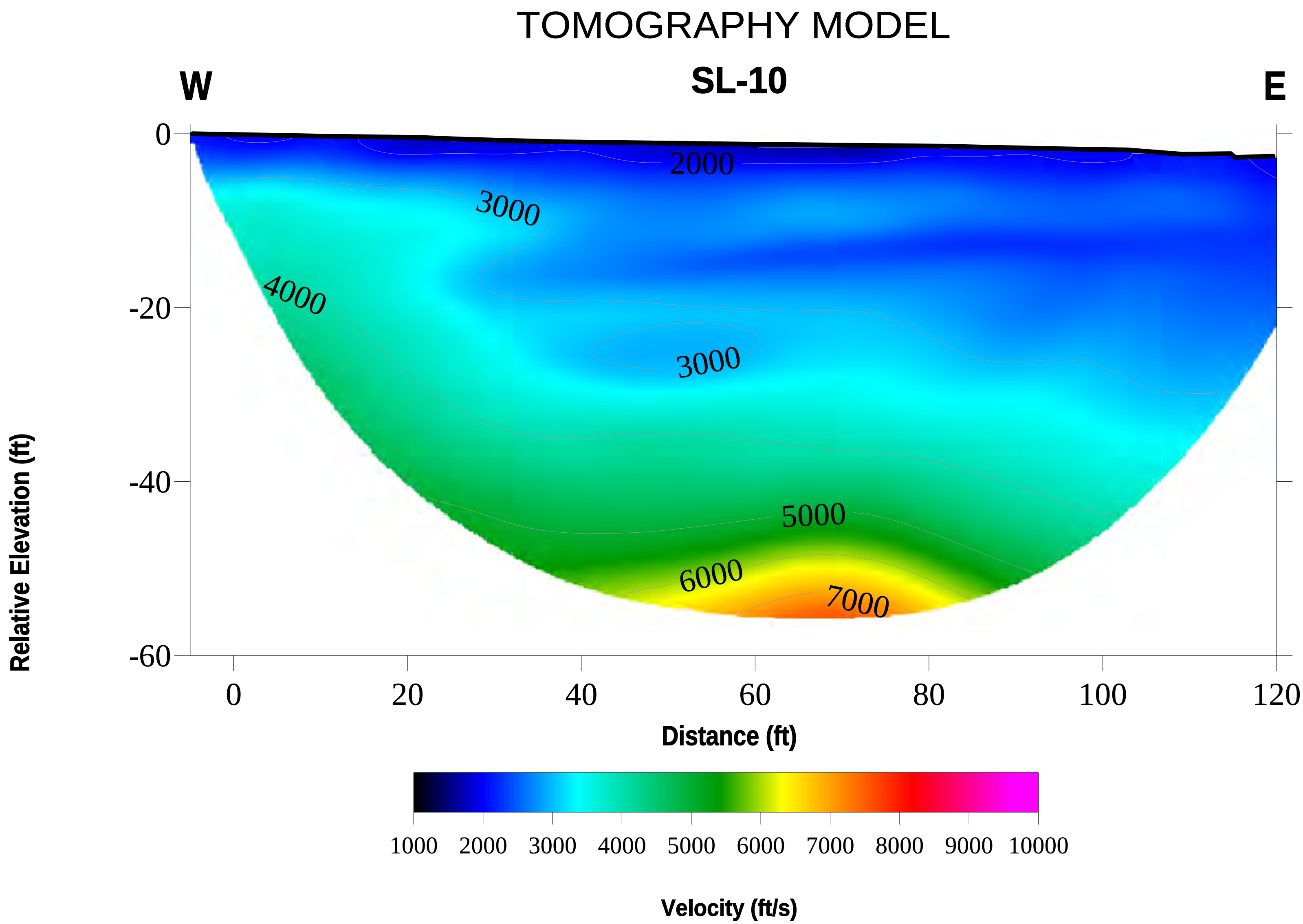
TOMOGRAPHY MODEL

SL-9



Note: Contour Interval = 1,000 feet per second

P-WAVE PROFILE SL-9	Good Hope - Olive Avenue Storm Drain Riverside, California		ATLAS Figure 4i
	Project No.: 8783.P6	Date: 03/23	

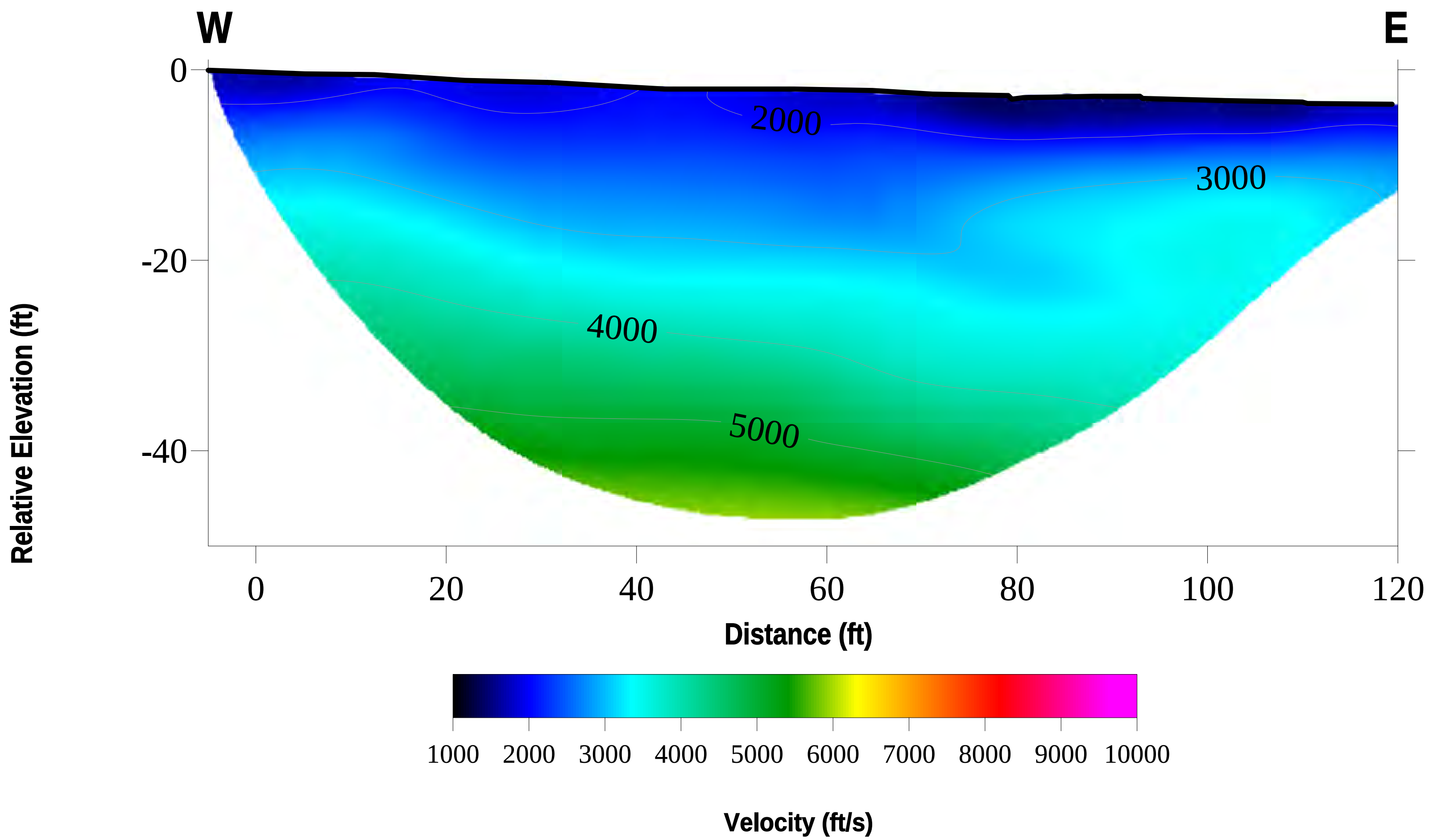


Note: Contour Interval = 1,000 feet per second

P-WAVE PROFILE SL-10	**Good Hope - Olive Avenue Storm Drain Riverside, California** Project No.: 8783.P6 — Date: 03/23	ATLAS Figure 4j

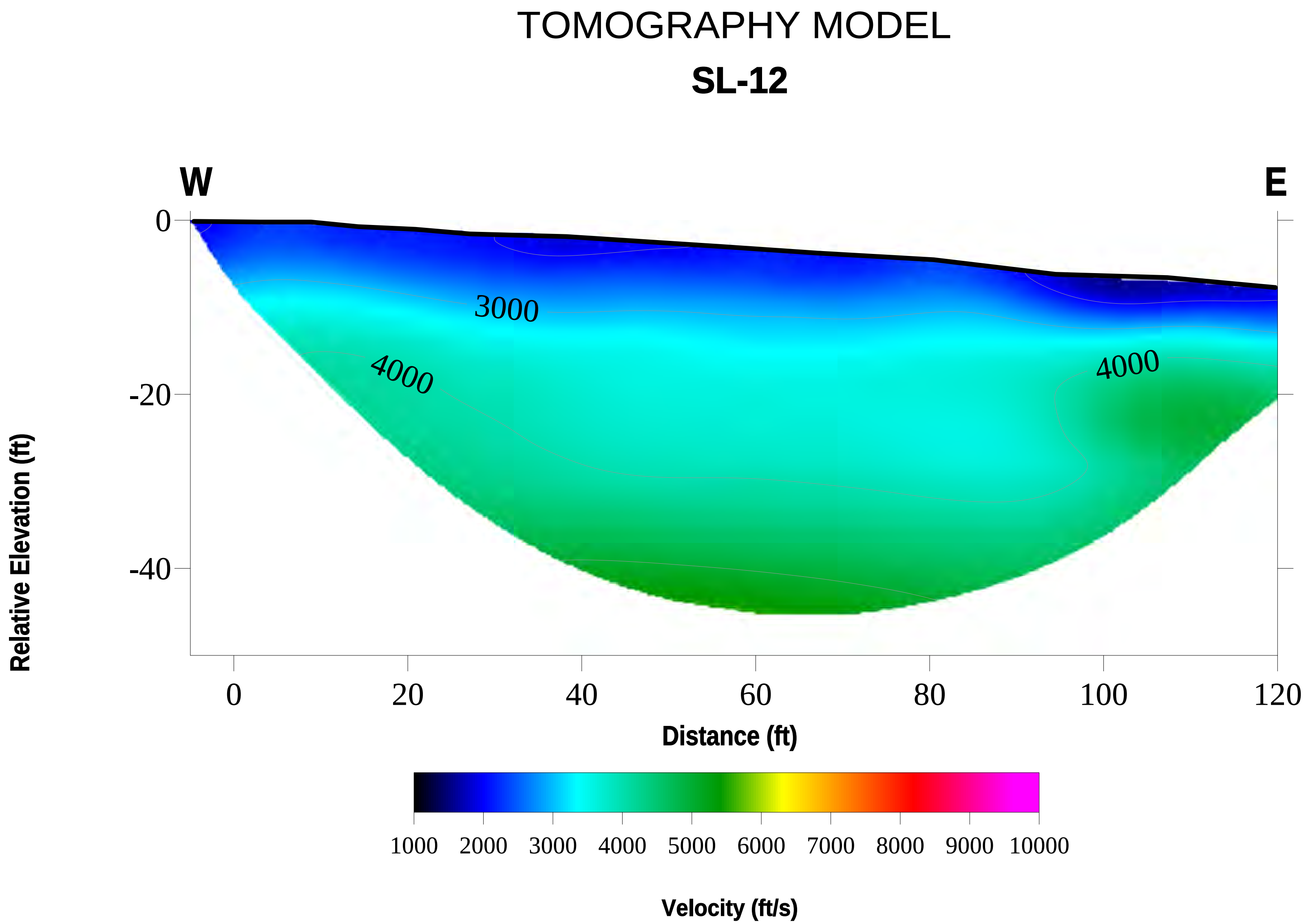
TOMOGRAPHY MODEL

SL-11



Note: Contour Interval = 1,000 feet per second

P-WAVE PROFILE SL-11	**Good Hope - Olive Avenue Storm Drain Riverside, California** Project No.: 8783.P6 / Date: 03/23	ATLAS Figure 4k

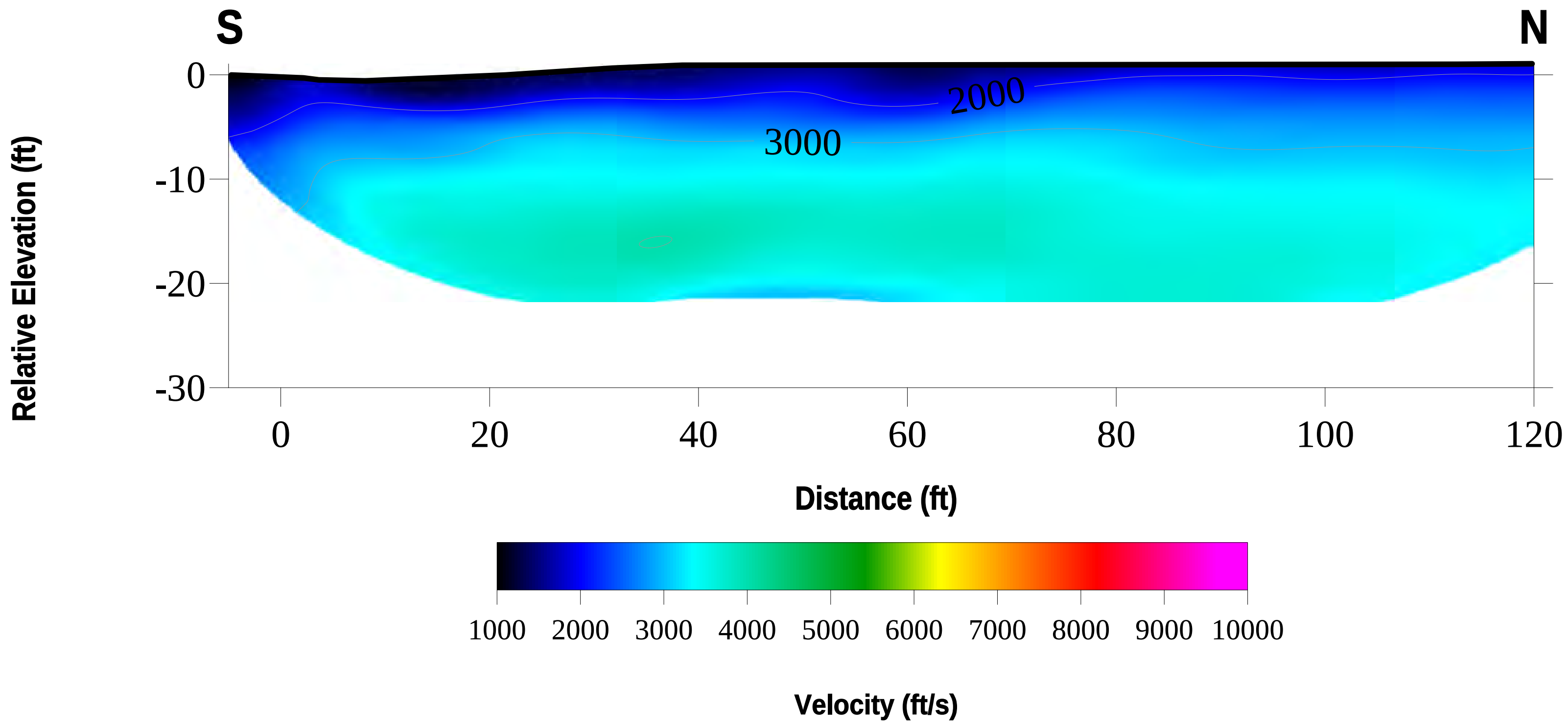


Note: Contour Interval = 1,000 feet per second

P-WAVE PROFILE SL-12	**Good Hope - Olive Avenue Storm Drain Riverside, California**	ATLAS
	Project No.: 8783.P6 / Date: 03/23	Figure 4l

TOMOGRAPHY MODEL

SL-13

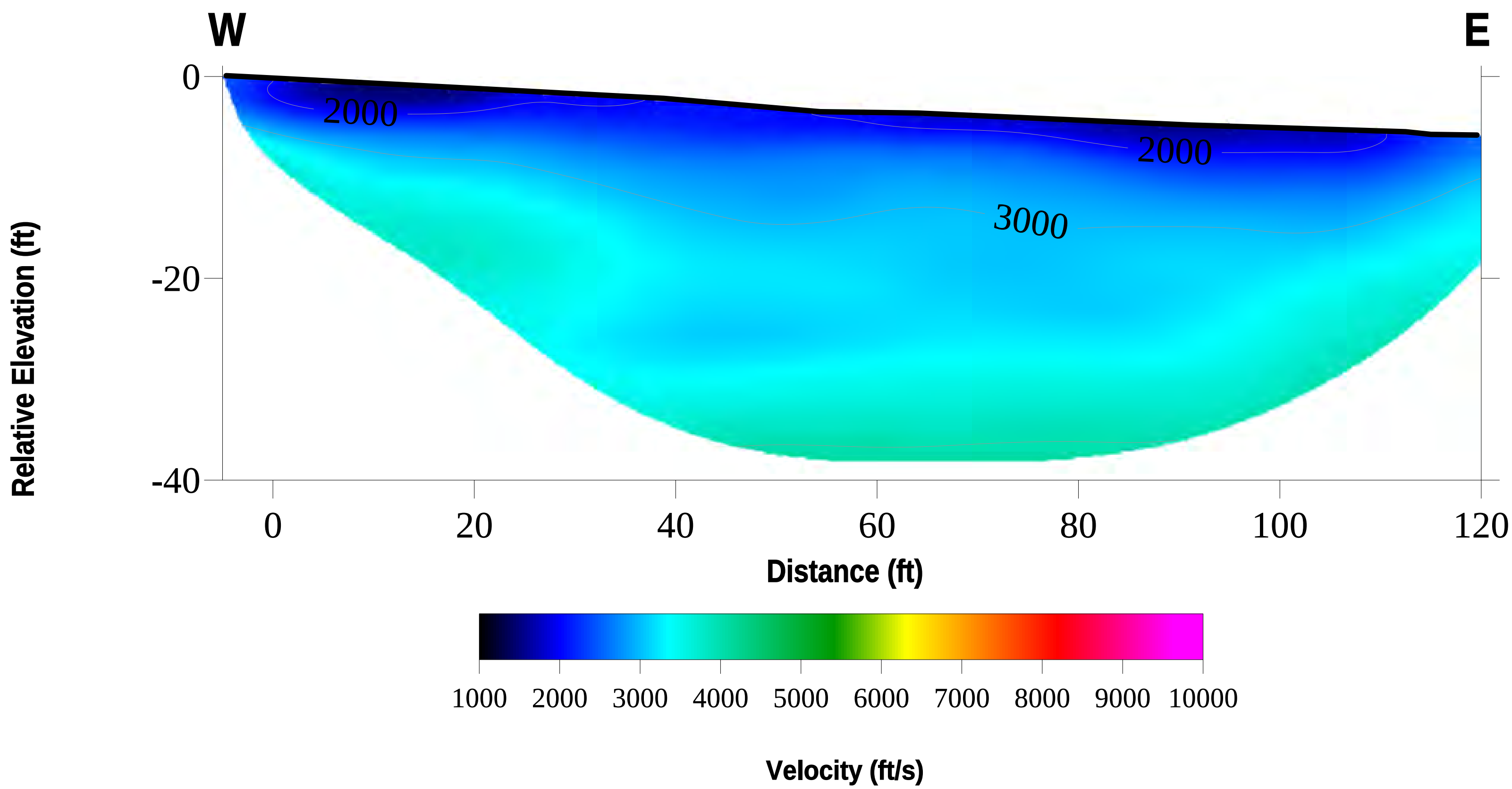


P-WAVE PROFILE SL-13	Good Hope - Olive Avenue Storm Drain Riverside, California	ATLAS Figure 4m
	Project No.: 8783.P6 / Date: 03/23	

Note: Contour Interval = 1,000 feet per second

TOMOGRAPHY MODEL

SL-14



P-WAVE PROFILE SL-14	Good Hope - Olive Avenue Storm Drain Riverside, California		ATLAS Figure 4n
	Project No.: 8783.P6	Date: 03/23	

Note: Contour Interval = 1,000 feet per second

SEISMIC REFRACTION STUDY
RIVERSIDE COUNTY STORM DRAIN
PERRIS, CALIFORNIA

PREPARED FOR:

Leighton and Associates
41715 Enterprise Circle North, Suite 103
Temecula, CA 92590

PREPARED BY:

Southwest Geophysics, LLC
6280 Riverdale Street, Suite 200
San Diego, CA 92120

April 30, 2020
120178SWG

ATLAS
SOUTHWEST GEOPHYSICS LLC
YOUR SUBSURFACE SOLUTION

April 30, 2020 Project No. 120178SWG

Mr. Bashir S. Saiid, P.E.
Leighton and Associates
41715 Enterprise Circle North, Suite 103
Temecula, California 92590

Subject: SEISMIC REFRACTION STUDY
RIVERSIDE COUNTY STORM DRAIN
PERRIS, CALIFORNIA

Dear Mr. Saiid:

In accordance with your authorization, we have performed a seismic refraction study pertaining to the Riverside County Storm Drain project located in Perris, California. Specifically, our evaluation consisted of performing 14 seismic P-wave refraction traverses at the project site. The purpose of our study was to develop subsurface velocity profiles of the areas studied, and to assess the depth to bedrock and apparent rippability of the subsurface materials. Our field services were conducted on April 13 and 14, 2020. This data report presents our methodology, equipment used, analysis, and results.

We appreciate the opportunity to be of service on this project. Should you have any questions please contact the undersigned at your convenience.

Respectfully submitted,
SOUTHWEST GEOPHYSICS, LLC

REGISTERED GEOPHYSICIST
PATRICK F. LEHRMANN
No. 1043
Exp. 1/31/22
STATE OF CALIFORNIA

Aaron T. Puente
Project Geophysicist

Patrick F. Lehrmann, P.G., P.Gp.
Principal Geologist/Geophysicist

ERC/ATP/PFL/ds

Distribution: bsaiid@leightongroup.com

TABLE OF CONTENTS

SECTION

PAGE

TABLE

FIGURES

1. INTRODUCTION

In accordance with your authorization, we have performed a seismic refraction study pertaining to the Riverside County Storm Drain project located in Perris, California. Specifically, our evaluation consisted of performing 14 seismic P-wave refraction traverses at the project site. The purpose of our study was to develop subsurface velocity profiles of the areas studied, and to assess the depth to bedrock and apparent rippability of the subsurface materials. Our field services were conducted on April 13 and 14, 2020. This data report presents our methodology, equipment used, analysis, and results.

2. SCOPE OF SERVICES

Our scope of services included:

- Performance of 14 seismic P-wave refraction traverses at the project site.
- Compilation and analysis of the data collected.
- Preparation of this data report presenting our results and conclusions.

3. SITE AND PROJECT DESCRIPTION

The project site is generally constrained between Read Street to the east, Theda Street to the west, Mountain Avenue to the north, and Eucalyptus Avenue to the south in Perris, California (Figure 1). The study areas are located on the shoulders of various dirt and paved asphalt roads. Figures 2a, 2b, and 3a through 3c present the general site conditions in the areas of the seismic traverses.

4. STUDY METHODOLOGY

A seismic P-wave (compression wave) refraction study was conducted at a portion of the project site to evaluate the rippability characteristics of the subsurface materials and to develop subsurface velocity profiles of the areas studied. The seismic refraction method uses first-arrival times of refracted seismic waves to estimate the thicknesses and seismic velocities of subsurface layers. Seismic P-waves generated at the surface, using a hammer and plate, are refracted at boundaries separating materials of contrasting velocities. These refracted seismic waves are then detected by a series of surface vertical component 14-Hz geophones and recorded with a 24-channel Geometrics Geode seismograph. The travel times of the seismic P-waves are used in conjunction with the shot-to-geophone distances to obtain thickness and velocity information on the subsurface materials.

Fourteen seismic lines (SL-1 through SL-14) were conducted in the study areas. The general locations and lengths of the lines were determined by you and your office. The lines were all 125 feet in length. Shot points (signal generation locations) were conducted along the lines at the ends, midpoint, and intermediate points between the ends and the midpoint.

The seismic refraction theory requires that subsurface velocities increase with depth. A layer having a velocity lower than that of the layer above will not generally be detectable by the seismic refraction method and, therefore, could lead to errors in the depth calculations of subsequent layers. In addition, lateral variations in velocity, such as those caused by core stones, intrusions or boulders can also result in the misinterpretation of the subsurface conditions. In general, the effective depth of evaluation for a seismic refraction traverse is approximately one-third to one-fifth the length of the spread.

The seismic P-wave velocity of a material can be correlated to rippability (see Table 1 below), or to some degree "hardness." Table 1 is based on published information from the Caterpillar Performance Handbook (Caterpillar, 2018), as well as our experience with similar materials, and assumes that a Caterpillar D-9 dozer ripping with a single shank is used. We emphasize that the cutoffs in this classification scheme are approximate and that rock characteristics, such as fracture spacing and orientation, play a significant role in determining rock quality or rippability. The rippability of a mass is also dependent on the excavation equipment used and the skill and experience of the equipment operator.

Table 1 – Rippability Classification

Seismic P-wave Velocity	Rippability
0 to 2,000 feet/second	Easy
2,000 to 4,000 feet/second	Moderate
4,000 to 5,500 feet/second	Difficult, Possible Blasting
5,500 to 7,000 feet/second	Very Difficult, Probable Blasting
Greater than 7,000 feet/second	Blasting Generally Required

For trenching operations, the rippability values should be scaled downward. For example, velocities as low as 3,500 feet/second may indicate difficult ripping during trenching operations. In addition, the presence of boulders, which can be troublesome in narrow trenching operations, should be anticipated.

It should be noted that the rippability cutoffs presented in Table 1 are slightly more conservative than those published in the Caterpillar Performance Handbook. Accordingly, the above classification scheme should be used with discretion, and contractors should not be relieved of making their own independent evaluation of the rippability of the on-site materials prior to submitting their bids.

5. DATA ANALYSIS

The collected data were processed using SIPwin (Rimrock Geophysics, 2003), a seismic interpretation program, and analyzed using SeisOpt Pro (Optim, 2008). SeisOpt Pro uses first arrival picks and elevation data to produce subsurface velocity models through a nonlinear optimization technique called adaptive simulated annealing. The resulting velocity model provides a tomography image of the estimated geologic conditions. Both vertical and lateral velocity information is contained in the tomography model. Changes in layer velocity are revealed as gradients rather than discrete contacts, which typically are more representative of actual conditions.

6. RESULTS AND CONCLUSIONS

As previously indicated, 14 seismic traverses were conducted as part of our study. Figures 4a through 4n present the velocity models generated from our analysis. Based on the results it appears that the project site is underlain by low velocity materials (i.e., topsoil, fill, etc.) in the near surface and higher velocity materials, likely bedrock, at depth. Distinct vertical and lateral velocity variations are evident in the models. Moreover, the degree of weathering and the depth to possible bedrock appears to be variable across the study areas. In addition, remnant boulders in the subsurface appear to be present in some areas.

Based on the refraction results, variability in the excavatability (including depth of rippability) of the subsurface materials should be expected across the project area. Furthermore, blasting may be required depending on the excavation depth, location, equipment used, and desired rate of production. In addition, oversized materials should be expected. A contractor with excavation experience in similar difficult conditions should be consulted for expert advice on excavation methodology, equipment and production rate.

7. LIMITATIONS

The field evaluation and geophysical analyses presented in this report have been conducted in general accordance with current practice and the standard of care exercised by consultants performing similar tasks in the project area. No warranty, express or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be present. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface surveying will be performed upon request.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Southwest Geophysics should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document. This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

8. SELECTED REFERENCES

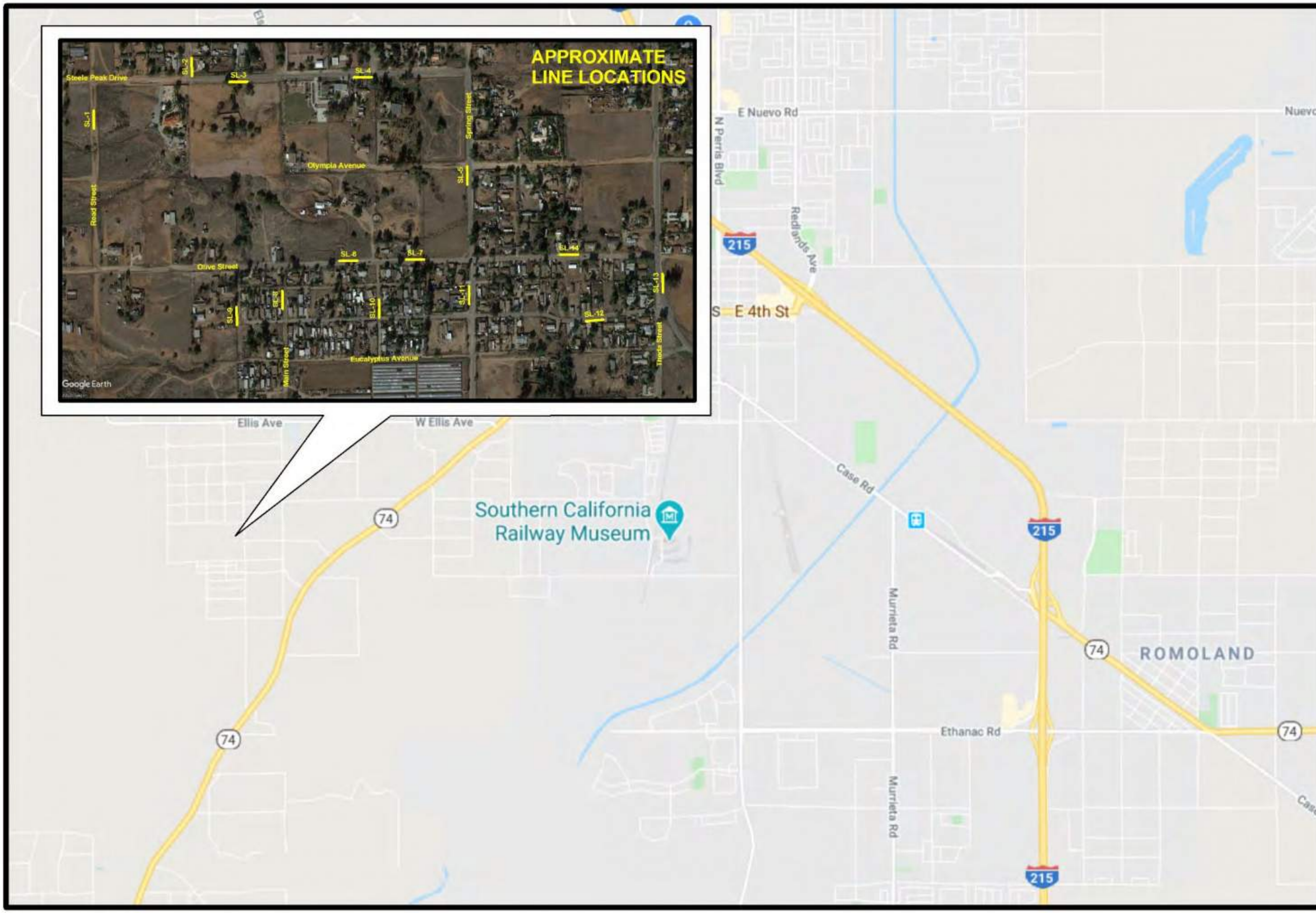
Caterpillar, Inc., 2018, Caterpillar Performance Handbook, Edition 48, Caterpillar, Inc., Peoria, Illinois.

Mooney, H.M., 1976, Handbook of Engineering Geophysics, dated February.

Optim, Inc., 2008, SeisOpt Pro, V-5.0.

Rimrock Geophysics, 2003, Seismic Refraction Interpretation Program (SIPwin), V-2.76.

Telford, W.M., Geldart, L.P., Sheriff, R.E., and Keys, D.A., 1976, Applied Geophysics, Cambridge University Pres



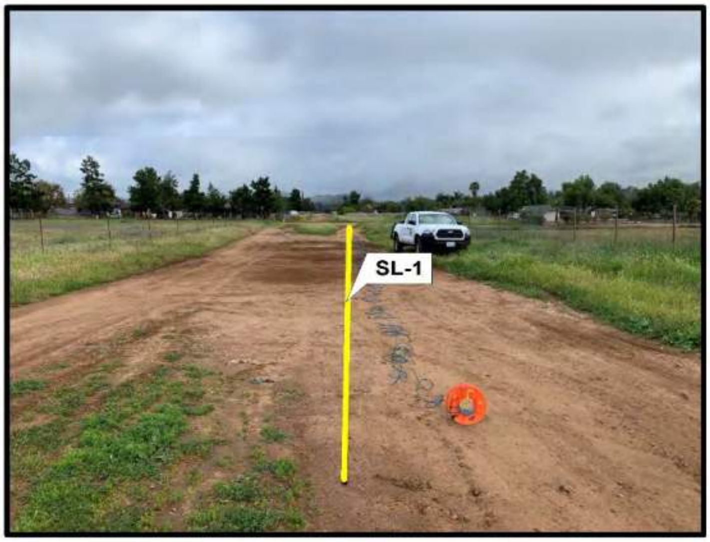
SITE LOCATION MAP	N	Riverside County Storm Drain Perris, California Project No.: 120178SWG — Date: 04/20	ATLAS SOUTHWEST GEOPHYSICS Figure 1

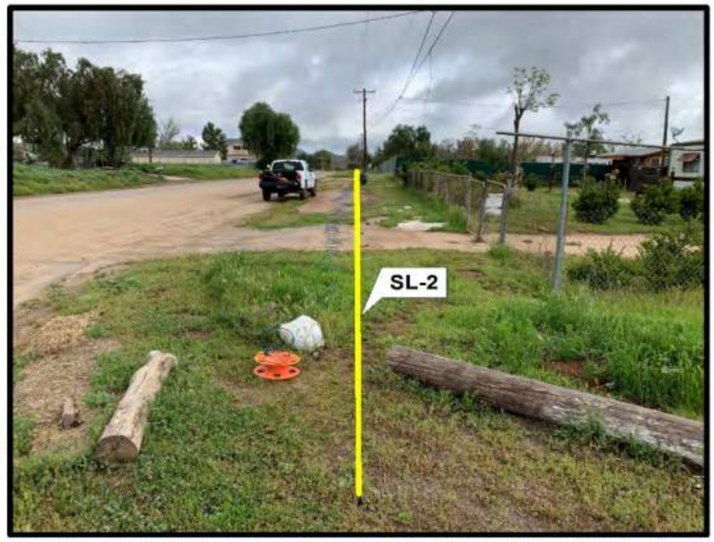
LINE LOCATION MAP **SL-1 through SL-5**	N	Riverside County Storm Drain Perris, California Project No.: 120178SWG Date: 04/20	ATLAS SOUTHWEST GEOPHYSICS Figure 2a

0 200 400
approximate scale in feet

LINE LOCATION MAP SL-6 through SL-14	N	Riverside County Storm Drain Perris, California	ATLAS SOUTHWEST GEOPHYSICS Figure 2b
		Project No.: 120178SWG Date: 04/20	

0 200 400
approximate scale in feet





SITE PHOTOGRAPHS **SL-1 through SL-6**	Riverside County Storm Drain Perris, California Project No.: 120178SWG Date: 04/20	ATLAS SOUTHWEST GEOPHYSICS Figure 3a

SITE PHOTOGRAPHS **SL-7 through SL-12**	Riverside County Storm Drain Perris, California Project No.: 120178SWG — Date: 04/20	ATLAS SOUTHWEST GEOPHYSICS Figure 3b

SITE PHOTOGRAPHS
SL-13 through SL-14

Riverside County Storm Drain
Perris, California

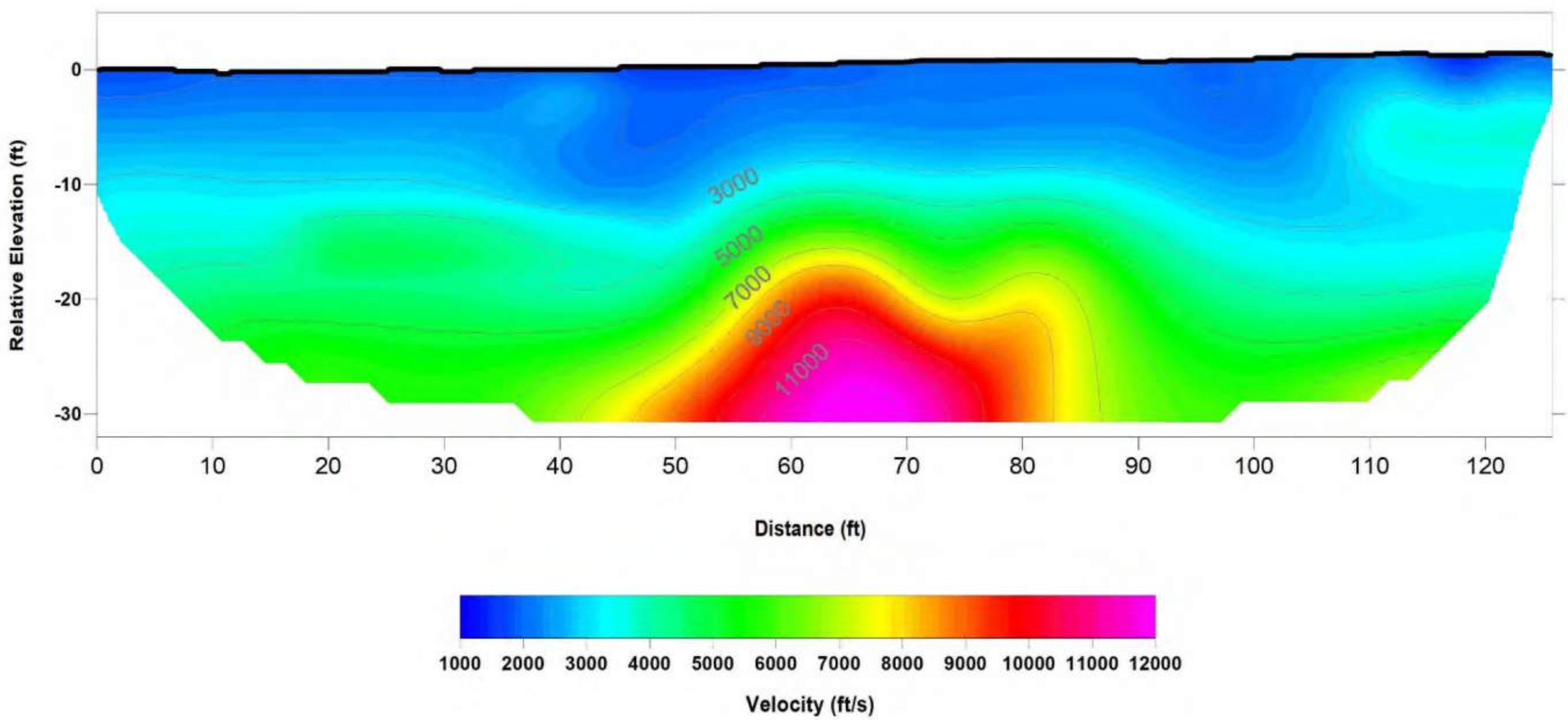
Project No.: 120178SWG | Date: 04/20

ATLAS SouthWest Geophysics

Figure 3c

TOMOGRAPHY MODEL

SL-1

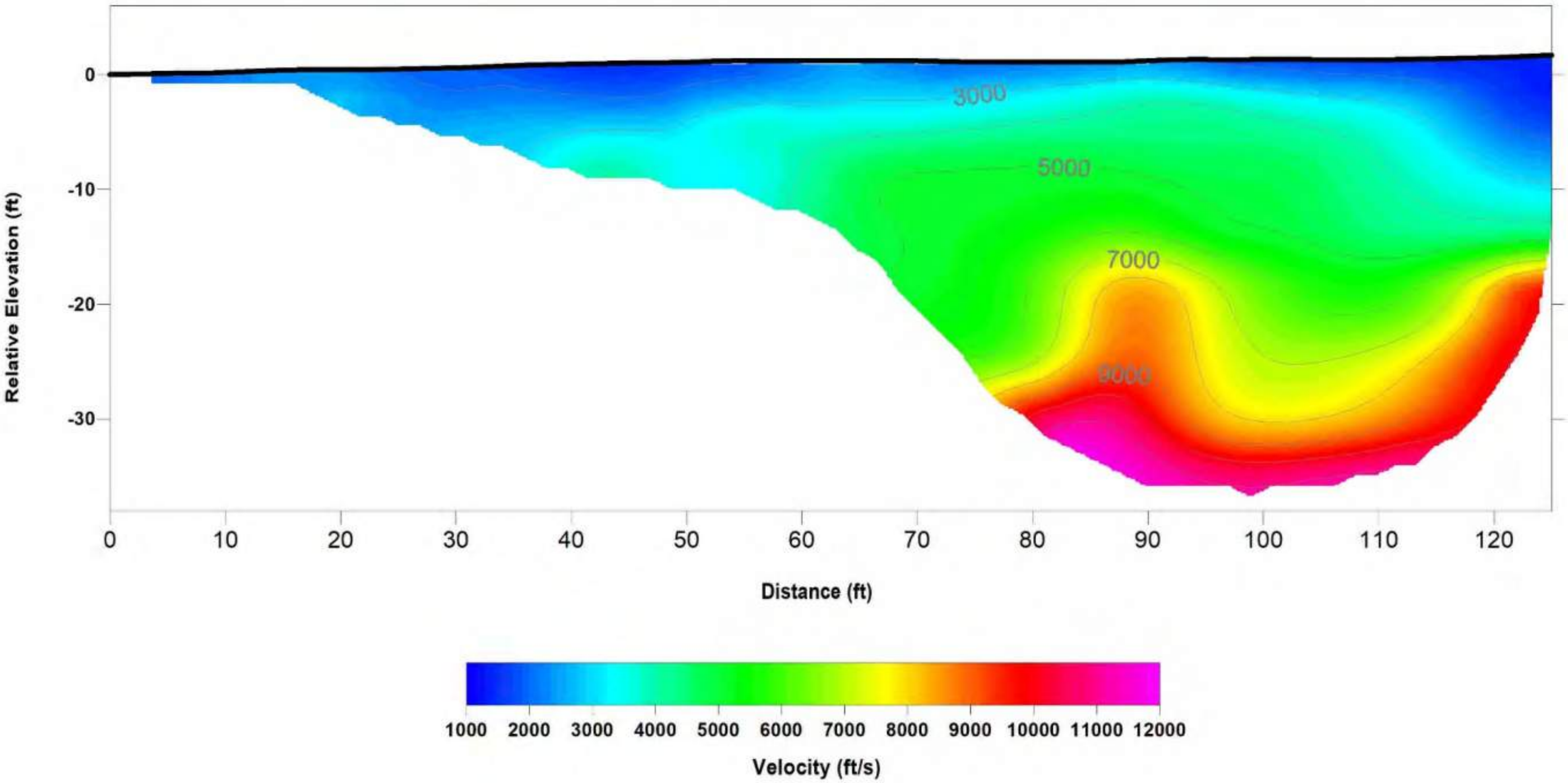


Note: Contour Interval = 1,000 feet per second

P-WAVE PROFILE	Riverside County Storm Drain Perris, California Project No.: 120178SWG Date: 04/20	SouthWest Geophysics LLC Figure 4a

TOMOGRAPHY MODEL

SL-2

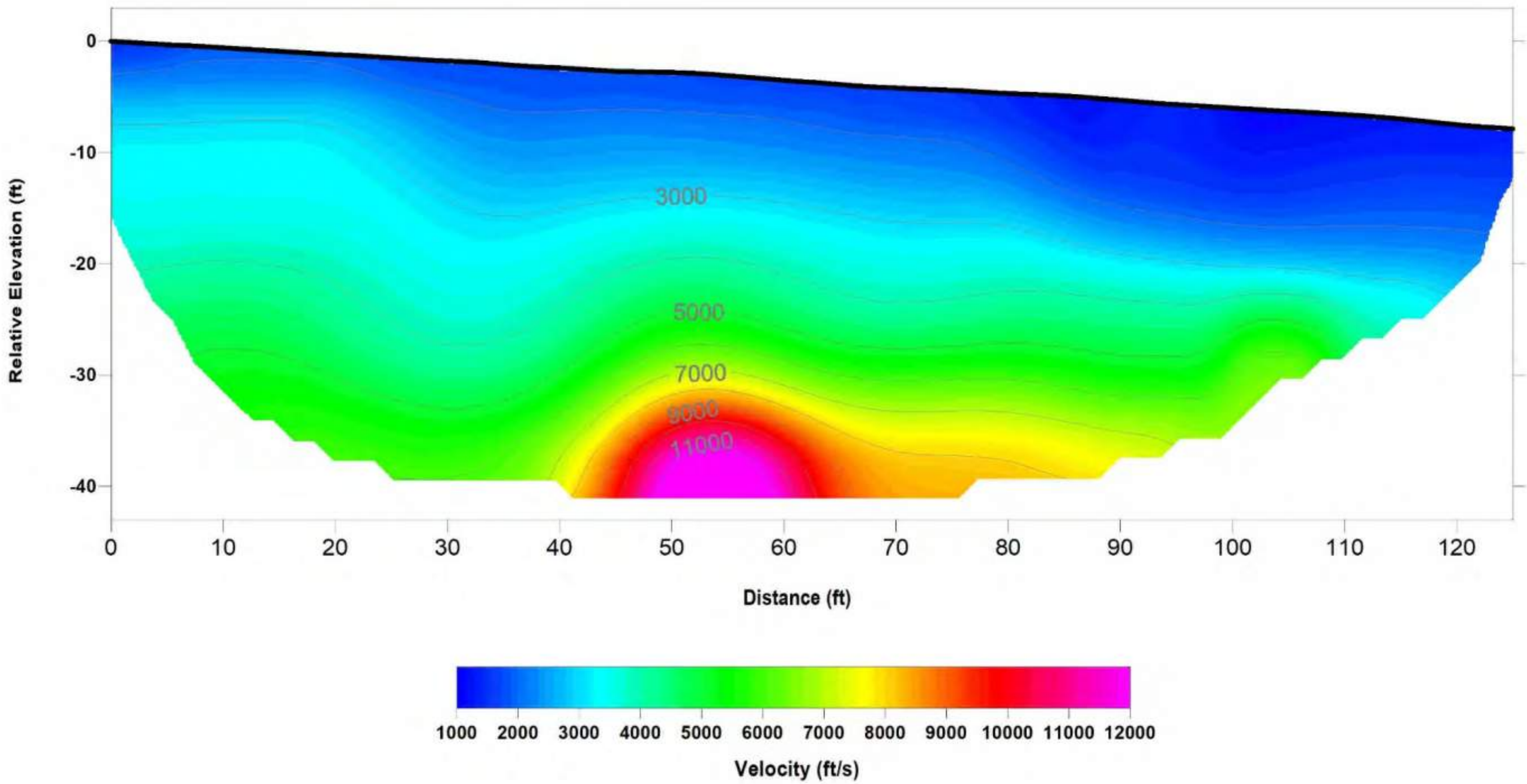


P-WAVE PROFILE	Riverside County Storm Drain Perris, California Project No.: 120178SWG — Date: 04/20	ATLAS SOUTHWEST GEOPHYSICS Figure 4b

Note: Contour Interval = 1,000 feet per second

TOMOGRAPHY MODEL

SL-3

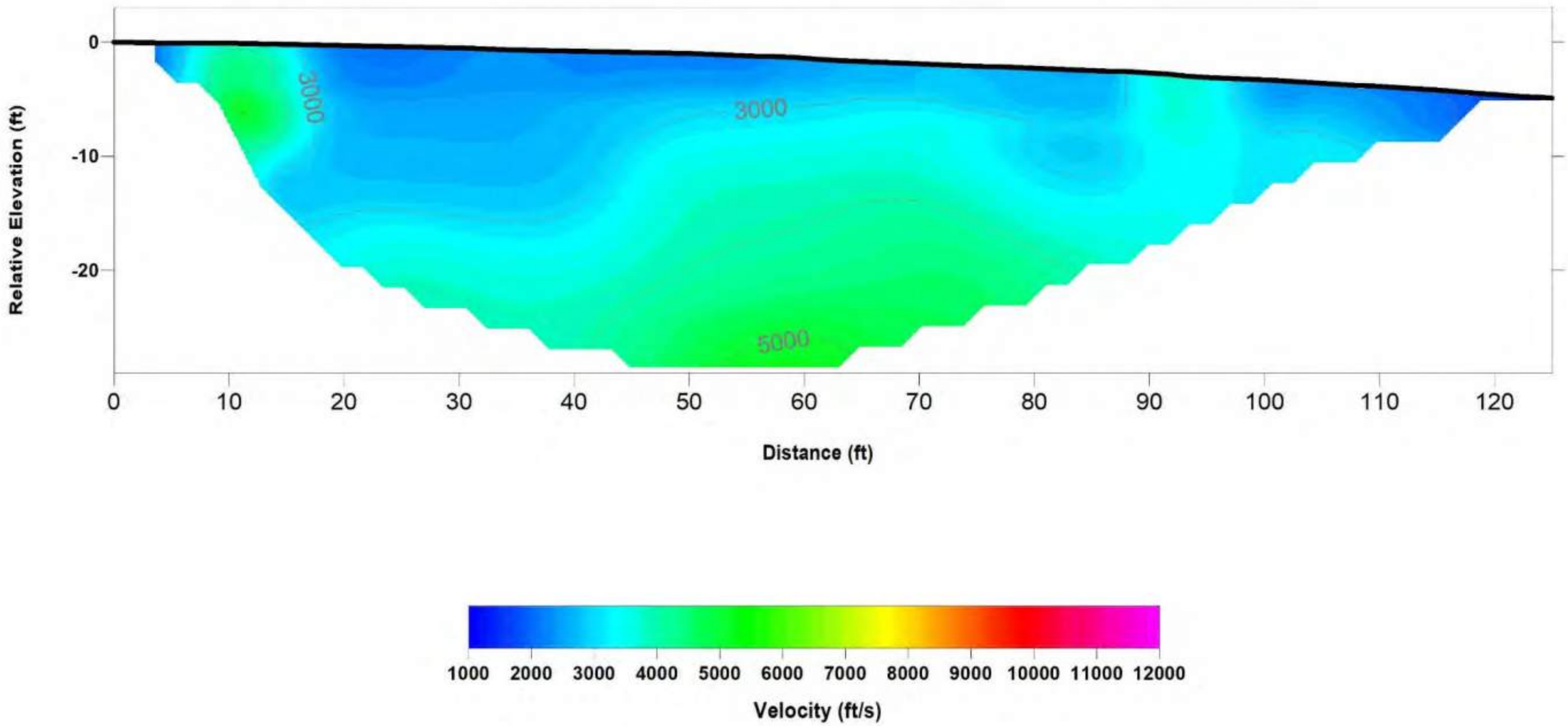


Note: Contour Interval = 1,000 feet per second

P-WAVE PROFILE	Riverside County Storm Drain Perris, California Project No.: 120178SWG — Date: 04/20	ATLAS SouthWest Geophysics Figure 4c

TOMOGRAPHY MODEL

SL-4

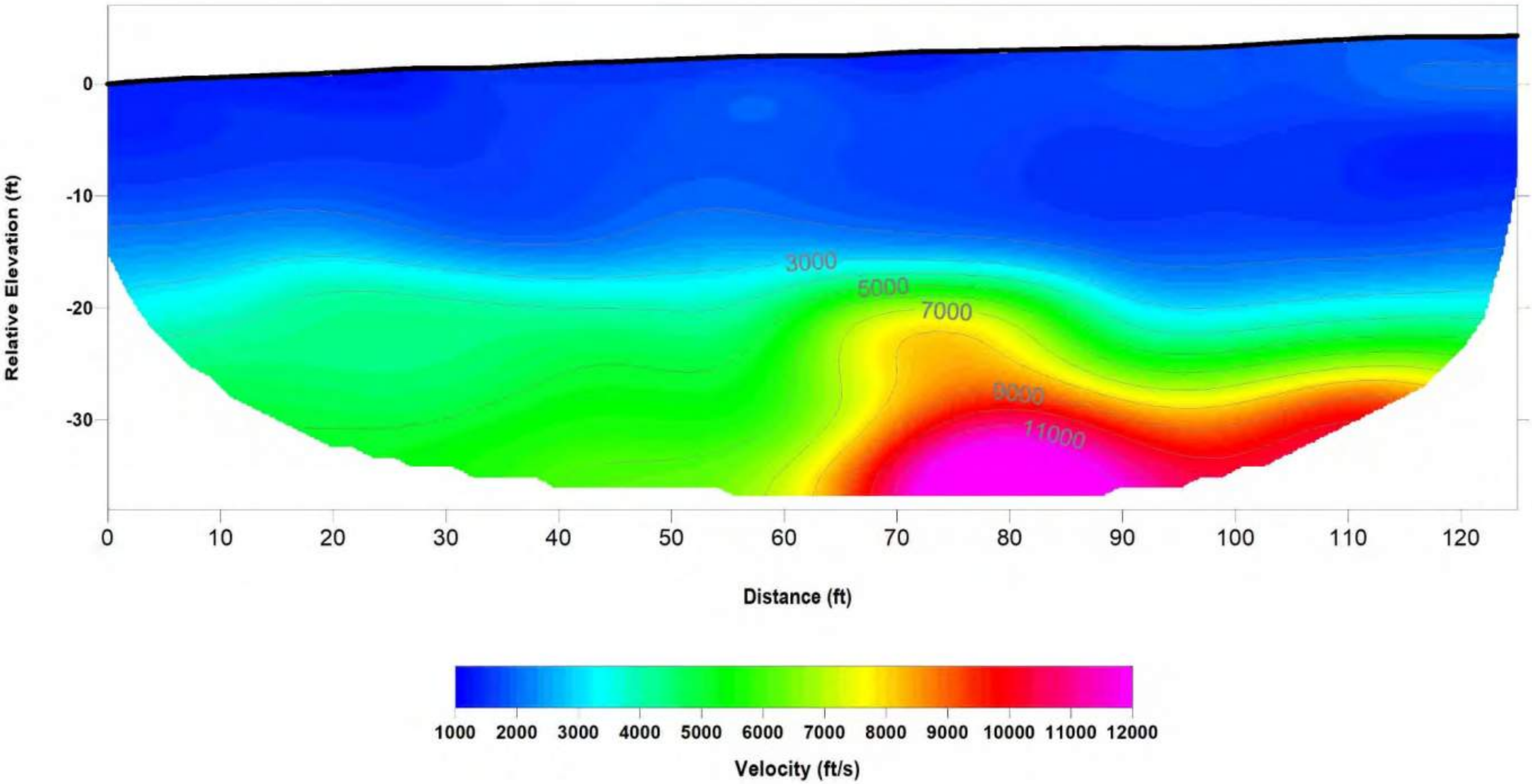


Note: Contour Interval = 1,000 feet per second

P-WAVE PROFILE	Riverside County Storm Drain Perris, California		ATLAS SOUTHWEST GEOPHYSICS Figure 4d
	Project No.: 120178SWG	Date: 04/20	

TOMOGRAPHY MODEL

SL-5

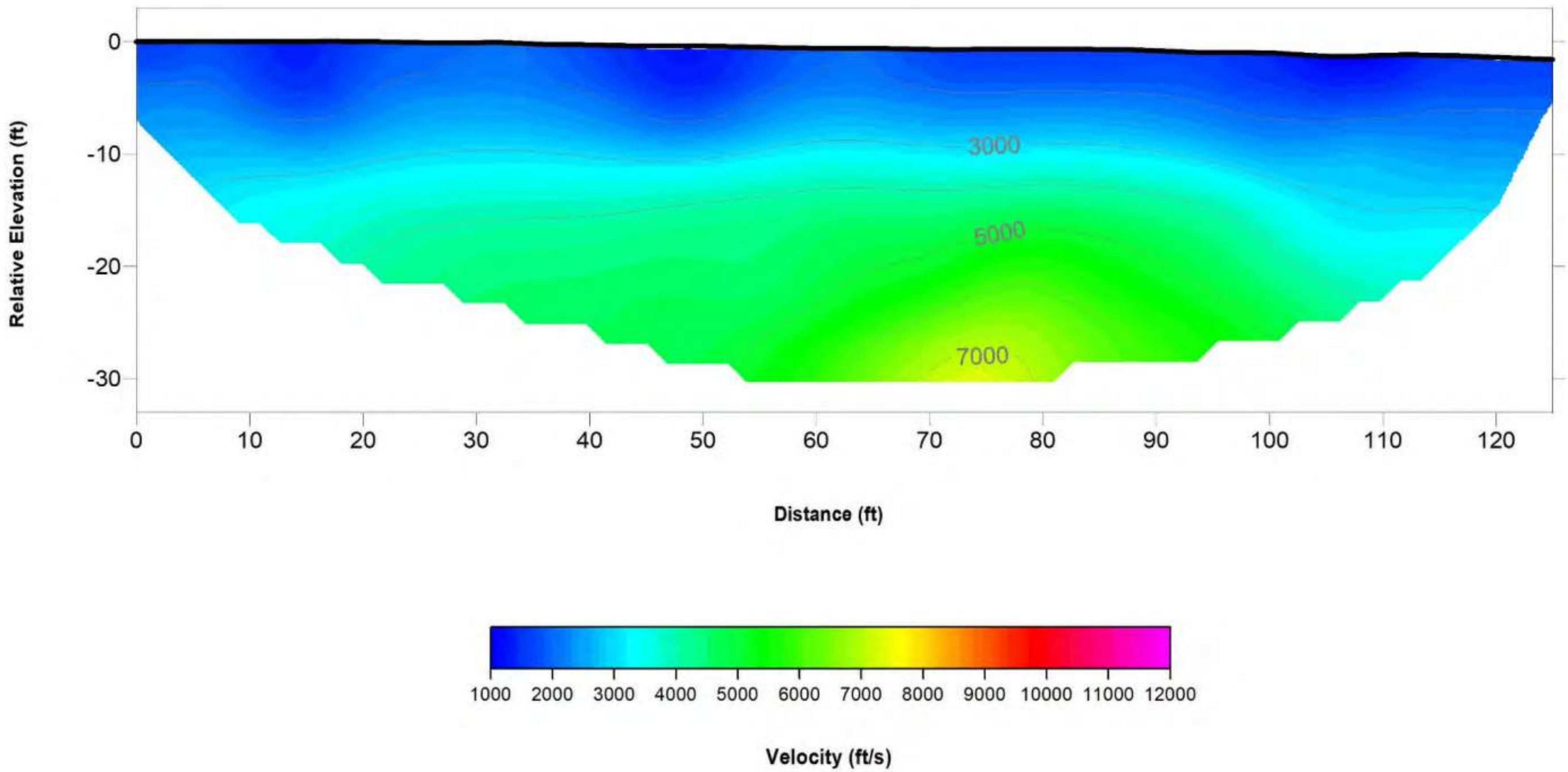


Note: Contour Interval = 1,000 feet per second

P-WAVE PROFILE	Riverside County Storm Drain Perris, California		ATLAS SOUTHWEST GEOPHYSICS Figure 4e
	Project No.: 120178SWG	Date: 04/20	

TOMOGRAPHY MODEL

SL-6

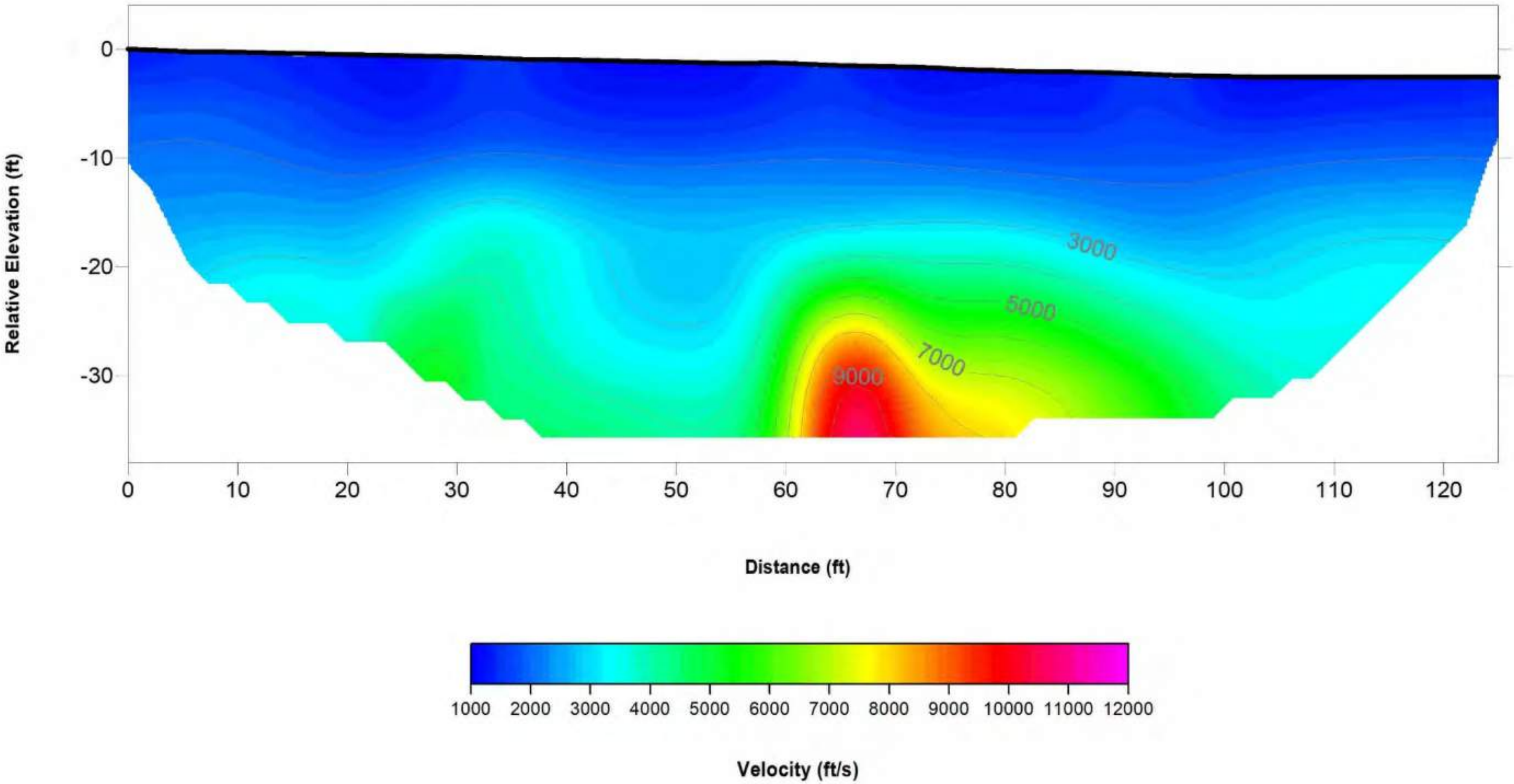


Note: Contour Interval = 1,000 feet per second

P-WAVE PROFILE	Riverside County Storm Drain Perris, California Project No.: 120178SWG / Date: 04/20	ATLAS / SouthWest Geophysics Figure 4f

TOMOGRAPHY MODEL

SL-7

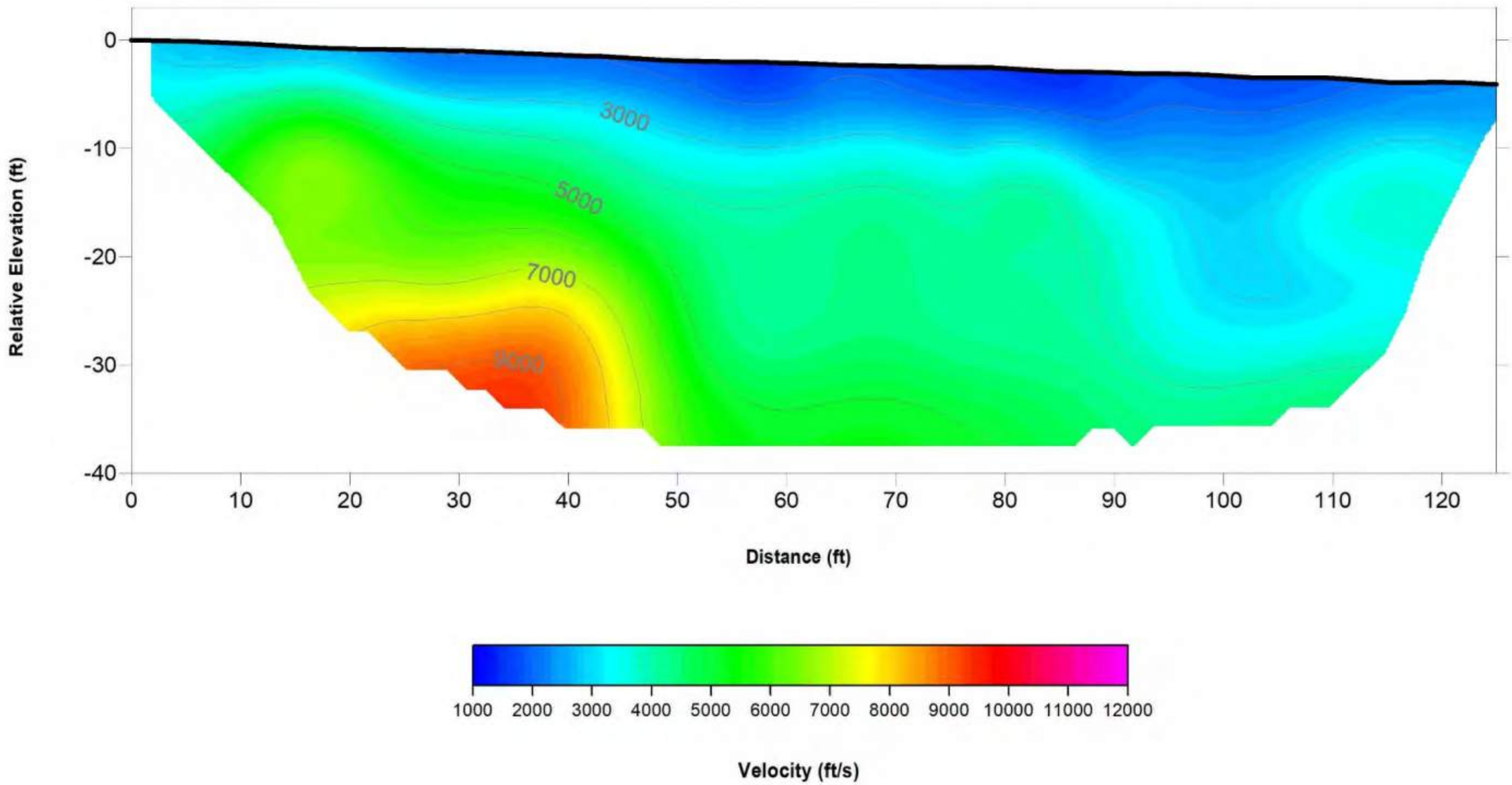


Note: Contour Interval = 1,000 feet per second

P-WAVE PROFILE	Riverside County Storm Drain Perris, California Project No.: 120178SWG / Date: 04/20	ATLAS SouthWest Geophysics Figure 4g

TOMOGRAPHY MODEL

SL-8

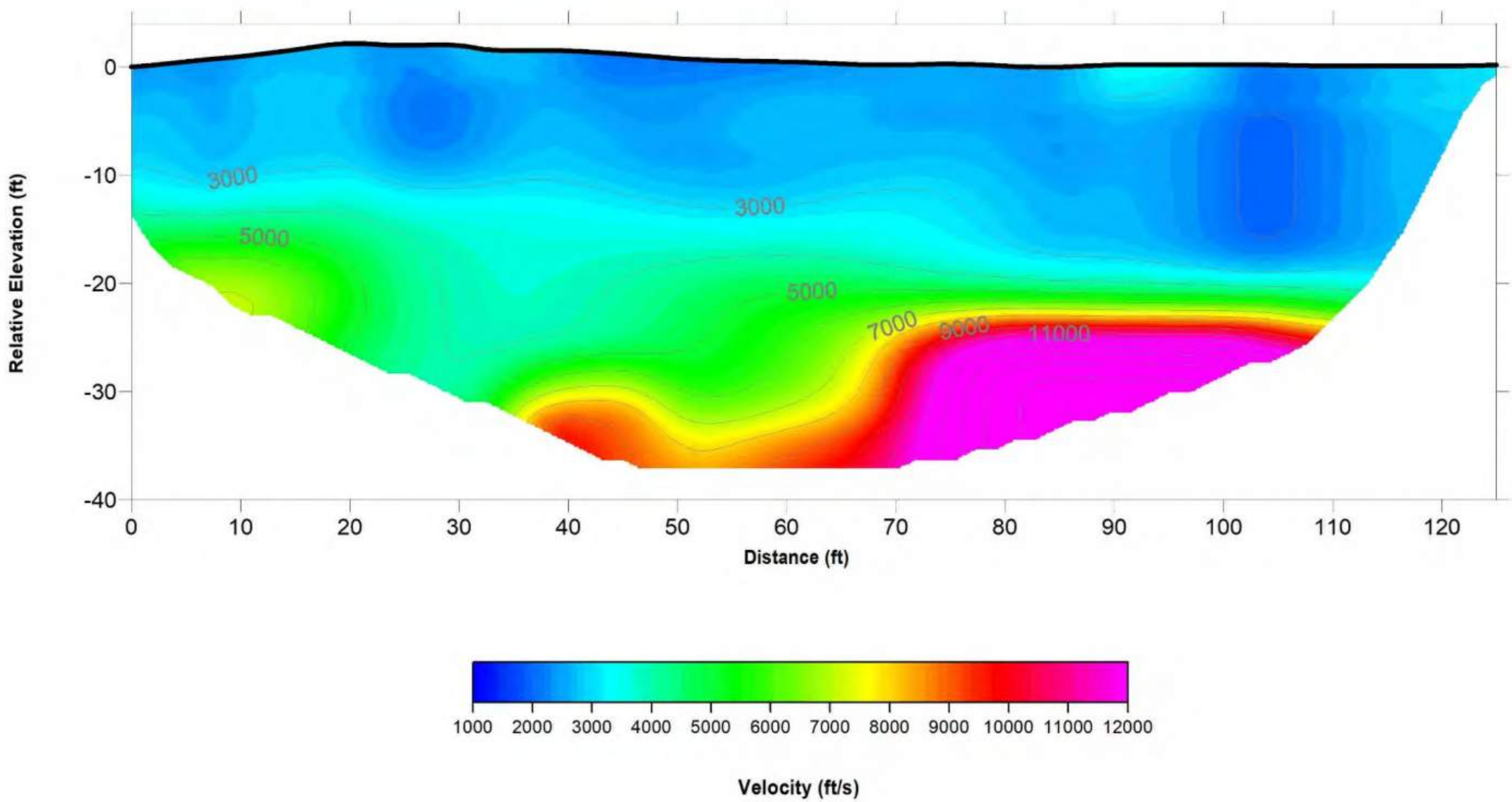


P-WAVE PROFILE	Riverside County Storm Drain Perris, California Project No.: 120178SWG — Date: 04/20	ATLAS SouthWest Geophysics Figure 4h

Note: Contour Interval = 1,000 feet per second

TOMOGRAPHY MODEL

SL-9

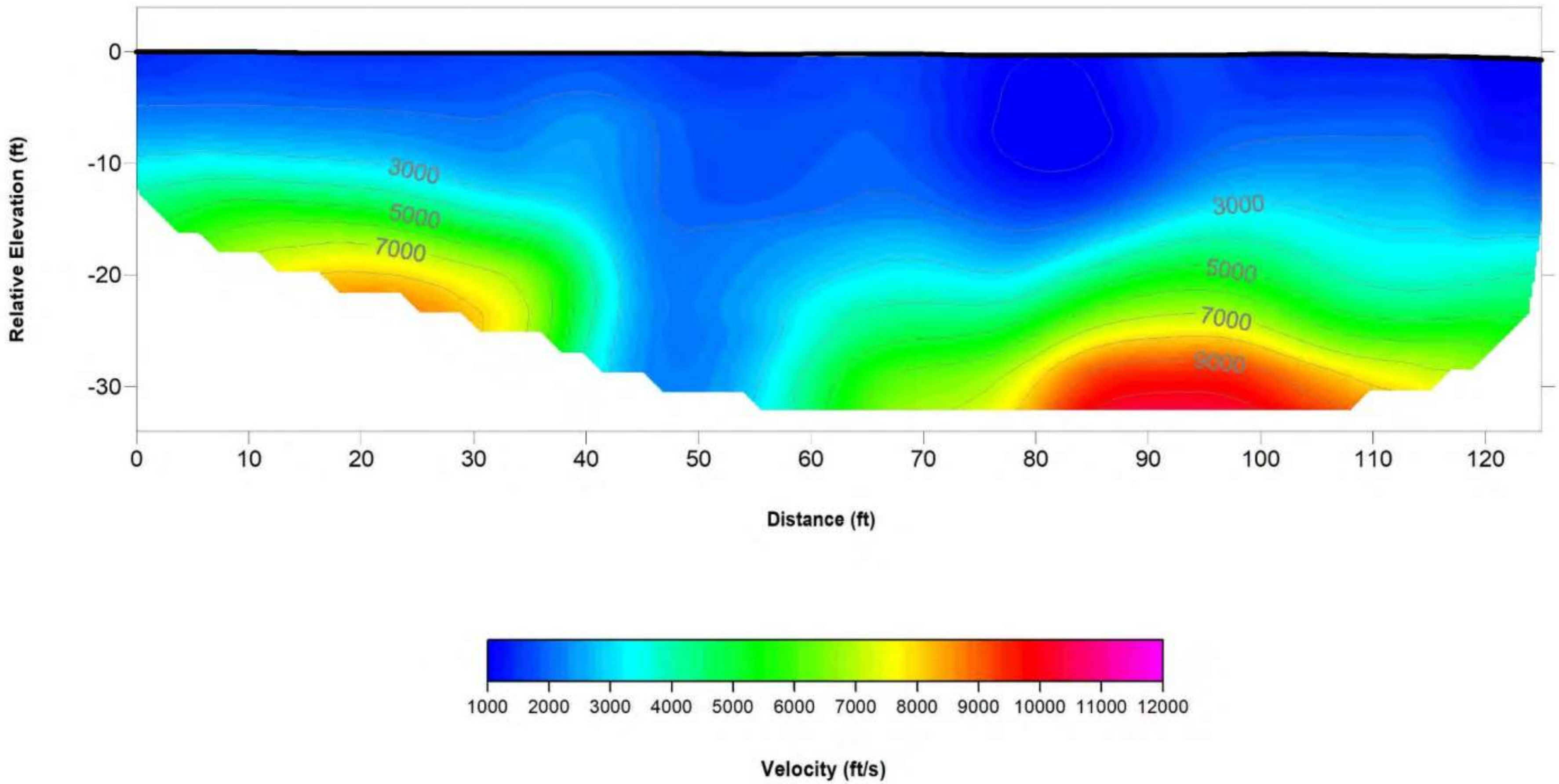


Note: Contour Interval = 1,000 feet per second

P-WAVE PROFILE	Riverside County Storm Drain Perris, California Project No.: 120178SWG — Date: 04/20	ATLAS SouthWest Geophysics Figure 4i

TOMOGRAPHY MODEL

SL-10

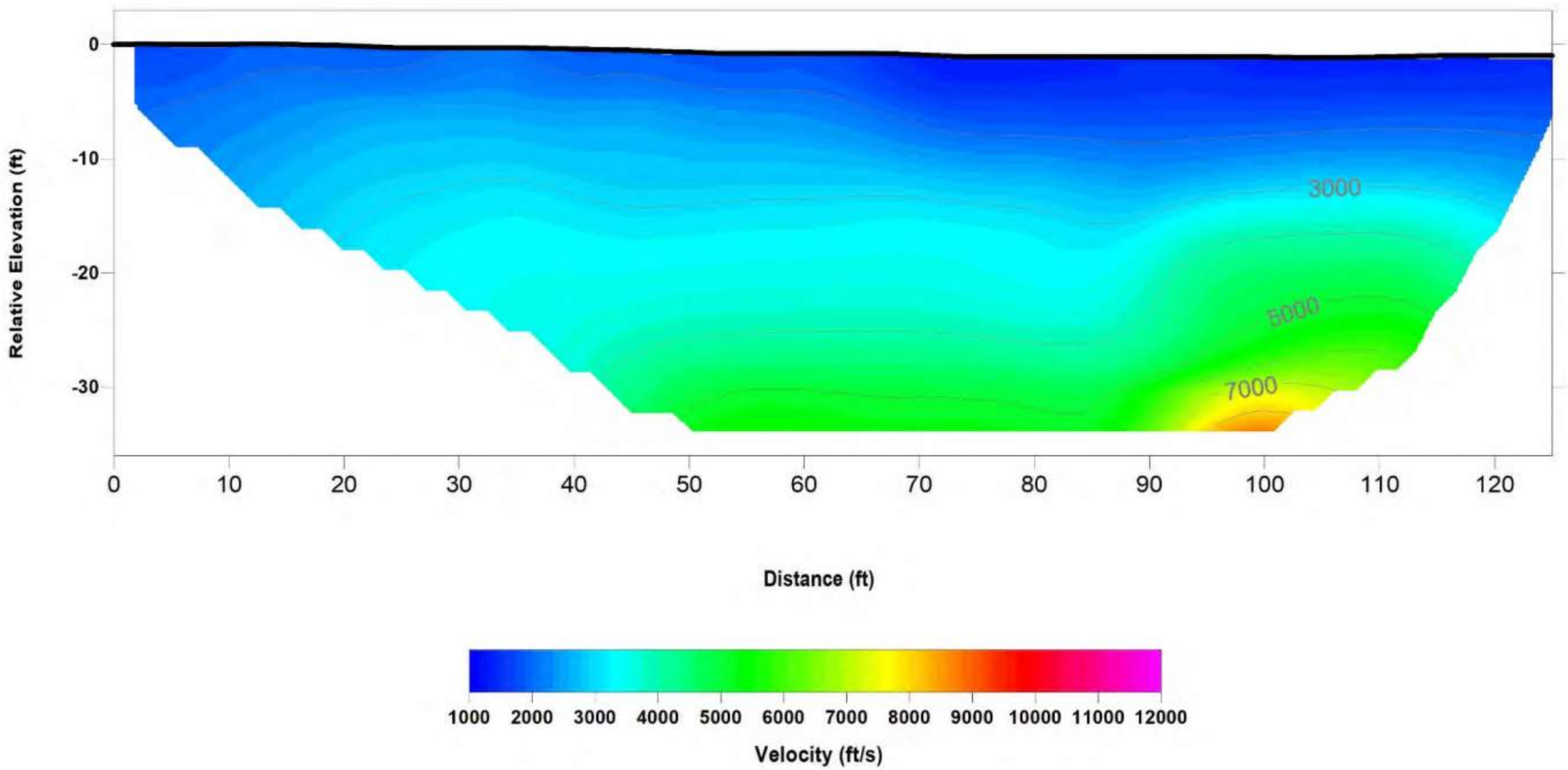


P-WAVE PROFILE	Riverside County Storm Drain Perris, California	ATLAS SouthWest Geophysics	Figure 4j
	Project No.: 120178SWG	Date: 04/20	

Note: Contour Interval = 1,000 feet per second

TOMOGRAPHY MODEL

SL-11

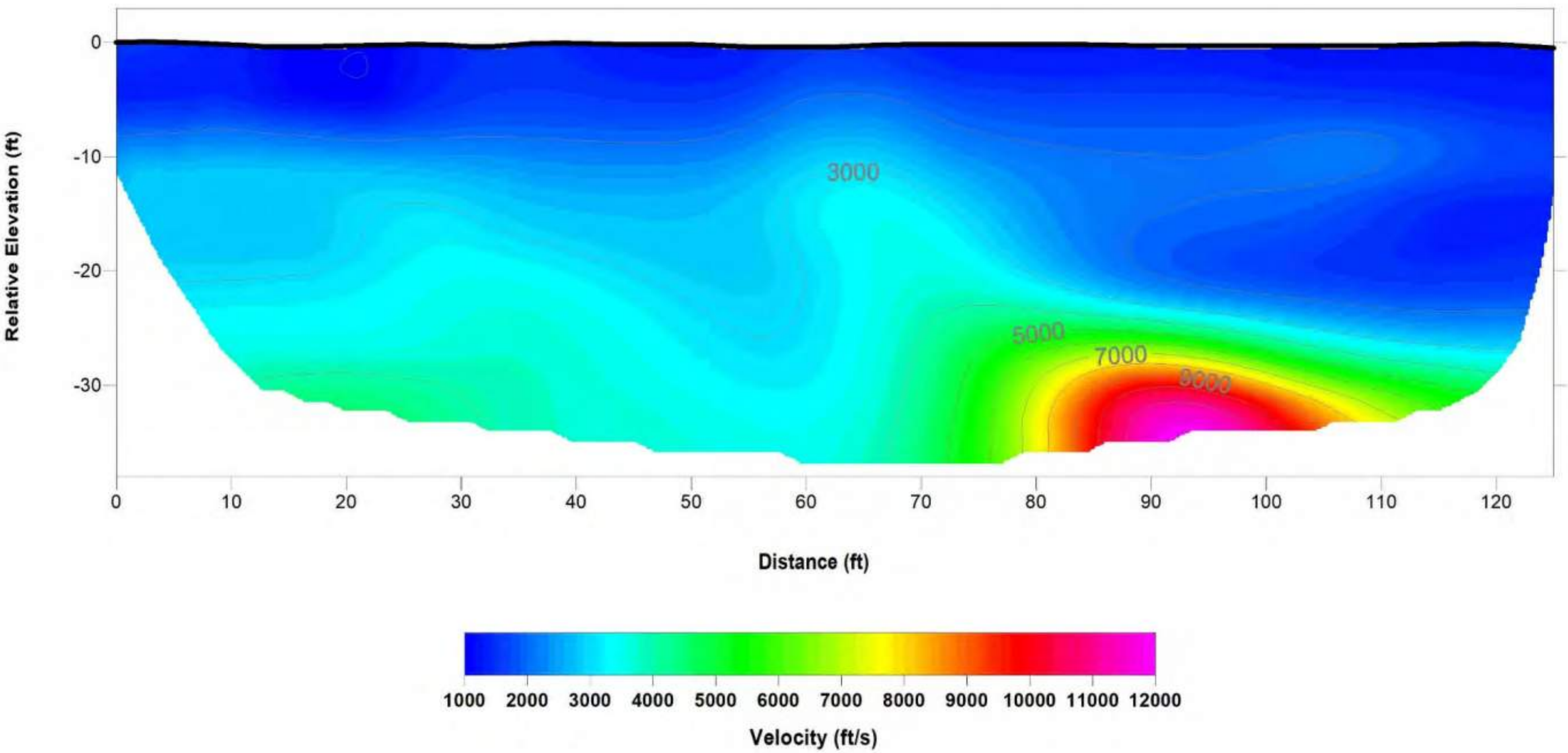


P-WAVE PROFILE	Riverside County Storm Drain Perris, California	ATLAS SOUTHWEST GEOPHYSICS
	Project No.: 120178SWG Date: 04/20	Figure 4k

Note: Contour Interval = 1,000 feet per second

TOMOGRAPHY MODEL

SL-12

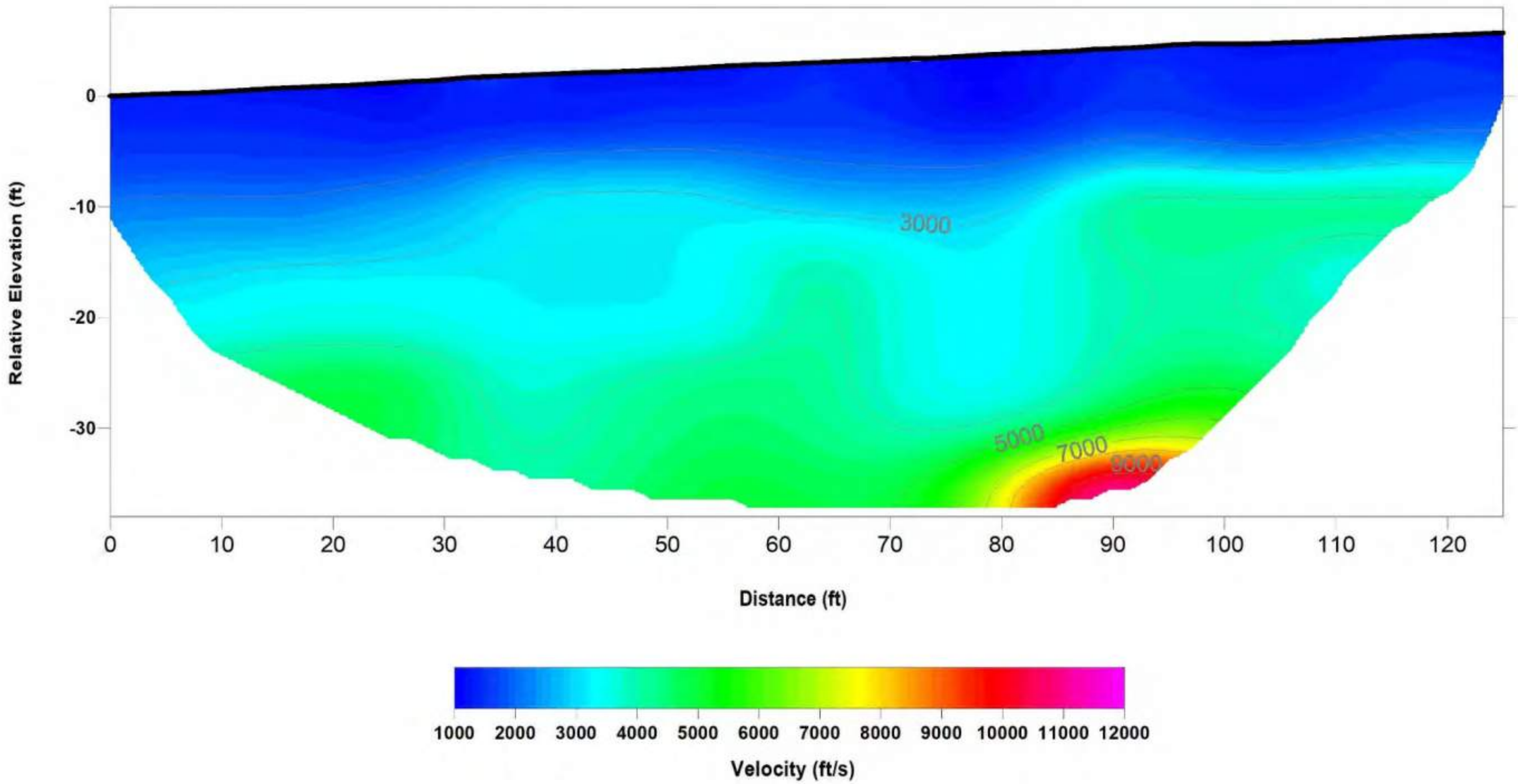


Note: Contour Interval = 1,000 feet per second

P-WAVE PROFILE	Riverside County Storm Drain Perris, California		ATLAS SOUTHWEST GEOPHYSICS Figure 4I
	Project No.: 120178SWG	Date: 04/20	

TOMOGRAPHY MODEL

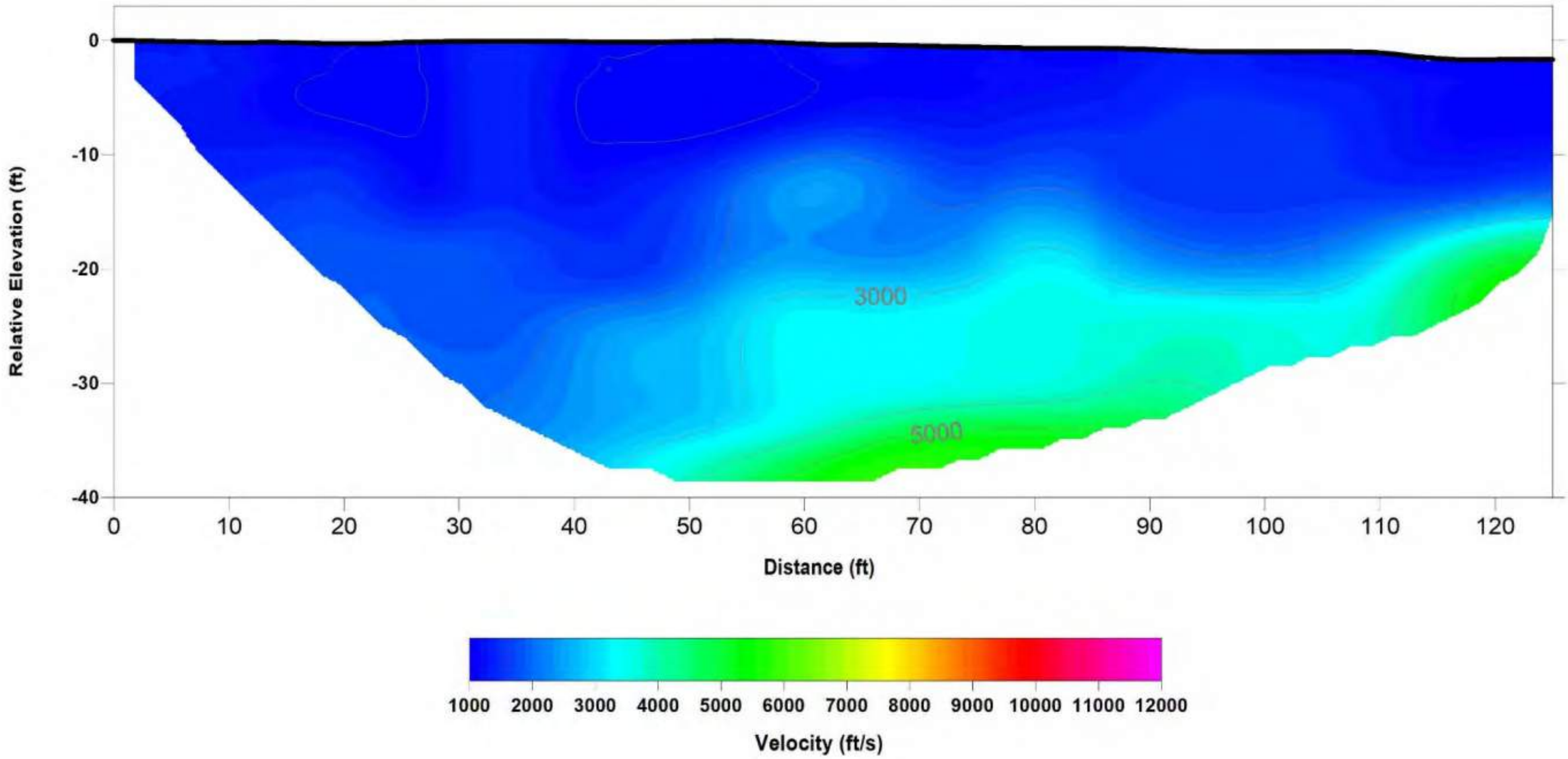
SL-13



P-WAVE PROFILE	Riverside County Storm Drain Perris, California Project No.: 120178SWG — Date: 04/20	ATLAS SOUTHWEST GEOPHYSICS Figure 4m	**Note: Contour Interval = 1,000 feet per second**

TOMOGRAPHY MODEL

SL-14



Note: Contour Interval = 1,000 feet per second

P-WAVE PROFILE	Riverside County Storm Drain Perris, California		ATLAS SOUTHWEST GEOPHYSICS Figure 4n
	Project No.: 120178SWG	Date: 04/20	

APPENDIX D

GBA Important Information about This Geotechnical Report

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer will <u>not</u> likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will <u>not</u> be adequate to develop geotechnical design recommendations for the project.

Do <u>not</u> rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do <u>not</u> rely on an executive summary. Do <u>not</u> read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept* *responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for information purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration*** by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org

APPENDIX G

Santa Ana Region MS4 Permit Program

Template for
Low Impact Development:
Guidance and Standards for Transportation Projects

D3-0080 Good Hope Paving Project

Prepared by:

County of Riverside Transportation Department

3525 14th Street

Riverside, CA 92501

(951) 955-6780

Project Certification

This report has been completed in compliance with the *Low Impact Development: Guidance and Standards for Transportation Projects*, prepared to comply with the Santa Ana Region MS4 Permit requirements applicable to Transportation Projects. The signatory of this document attests to the technical information contained herein and the date upon which recommendations, conclusions, and decisions have been based. I find this report to be complete, current, and accurate:

Name: ______________________________

Title: __Engineering Project Manager_______

Agency: __County of Riverside (Transportation)

Date: 8/23/2024

Section 1: Introduction

Overview

The federal Clean Water Act (CWA) establishes requirements for the discharge of urban runoff from Municipal Separate Storm Sewer Systems (MS4) under the National Pollutant Discharge Elimination System (NPDES) program. On January 29, 2010, the Santa Ana Regional Water Quality Control Board (RWQCB) issued Permit Order No. R8-2010-0033 ("MS4 Permit") to authorize the discharge of urban runoff from MS4 facilities in Riverside County within the Santa Ana Region MS4 Permit area.

The MS4 Permit requires development of a standard design and post-development Best Management Practices (BMP) guidance to guide application of Low Impact Development (LID) BMPs to the maximum extent practicable (MEP) on streets, roads or highways under the jurisdiction of the Permittees used for transportation of automobiles, trucks, motorcycles, and other vehicles. The Santa Ana Region MS4 Permit Program prepared the *Low Impact Development: Guidance and Standards for Transportation Projects* ("Guidance") to provide direction to Transportation Project owners and operators regarding how to address MS4 Permit requirements for public works Transportation Projects within their jurisdiction.

The LID-based BMP techniques contained within this document are based on information provided by a variety of sources, including the *Design Handbook for Low Impact Development Best Management Practices* prepared by the Riverside County Flood Control and Water Conservation District, Environmental Protection Agency's (USEPA) Municipal Handbook, *Managing Wet Weather with Green Infrastructure: Green Streets*, and the *Low Impact Development Manual for Southern California* prepared for the Southern California Stormwater Monitoring Coalition, in cooperation with the State Water Resources Control Board, by the Low Impact Development Center. This Guidance also provides links and references to other sources of information regarding the application of LID-based BMPs to Transportation Projects (Section 6). This referenced material should be used by the project owner/operator as appropriate to support the use of this template during the project design phase.

This template was prepared to provide a tool for project proponents to (1) determine the applicability of the Guidance to a proposed Transportation Project; (2) provide a process for evaluating the feasibility of using LID-based techniques in the proposed project; and (3) establish a template for documenting the project evaluation process and the decisions made regarding the feasibility to incorporate LID-based BMPs into the design of the project. Users should review the Guidance before applying this template to a proposed project.

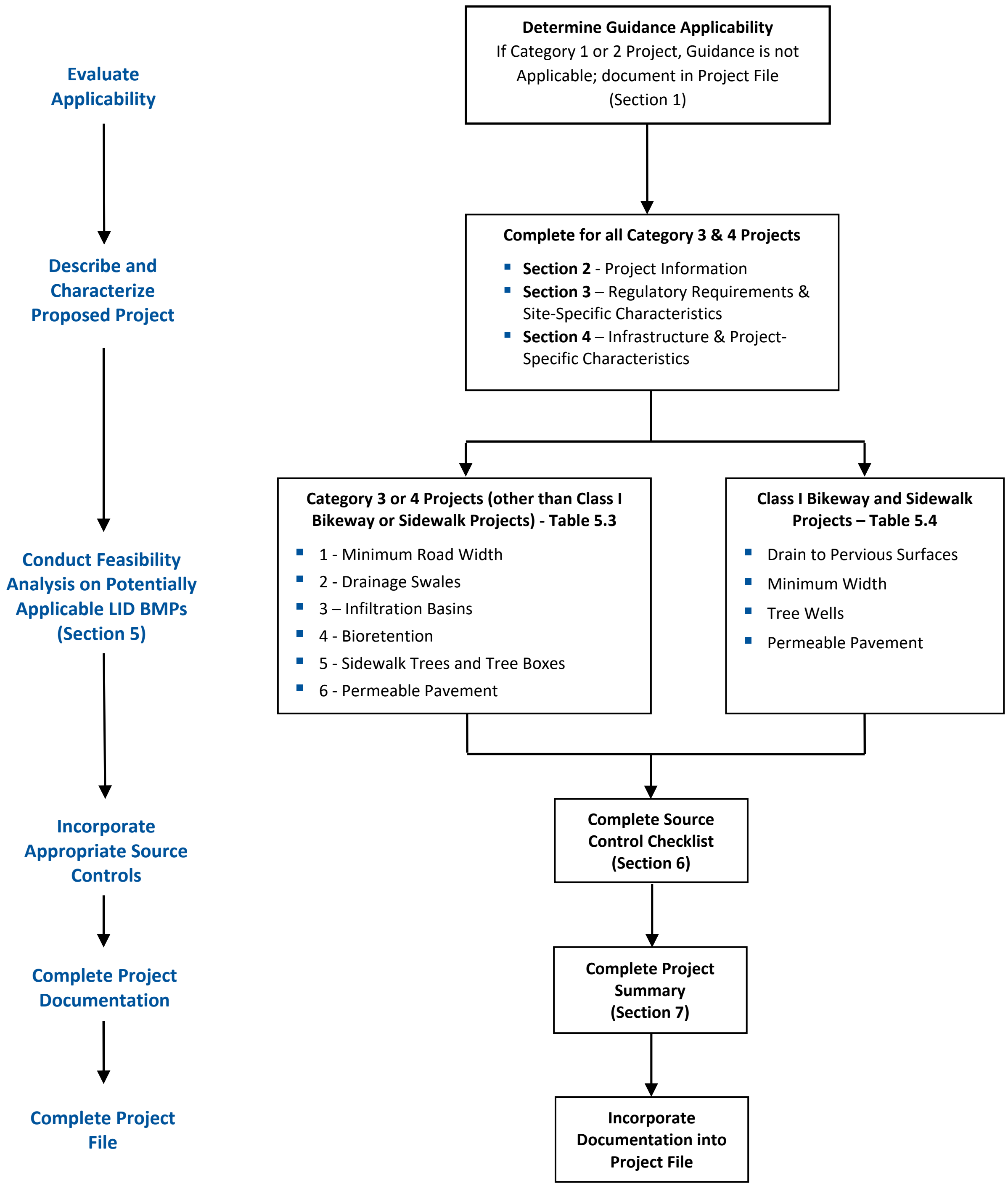
Guidance Applicability

Table 1.1 summarizes the applicability of the Guidance to Transportation Projects. If the Guidance applies to the proposed project, this template should be used to evaluate the feasibility of incorporating LID-based BMPs into the project design. Figure 1-1 illustrates the process for completing the template. Refer to this figure as needed to ensure that all steps are completed.

Table 1.1. Transportation Project Guidance Applicability

The Transportation Project Guidance applies to the following projects: • Public Transportation Projects in the area covered by the Santa Ana Region MS4 Permit, which involve the construction of new transportation surfaces or the improvement of existing transportation surfaces (including Class I Bikeways and sidewalks).
The Transportation Project Guidance does not apply to the following projects that are either exempt or covered by other MS4 Permit requirements: • Transportation Projects that have received CEQA approval by the effective date of this Guidance • Emergency Projects, as defined by this Guidance (see Section 2 of the Guidance) • Maintenance Projects, as defined by this Guidance (see Section 2 of the Guidance) • Dirt or gravel roads • Transportation Projects that are part of a private new development or significant redevelopment project and required to prepare a Water Quality Management Plan (WQMP) • Transportation Projects subject to other MS4 Permit requirements, e.g., California Transportation Department (Caltrans) oversight projects, cooperative projects with an adjoining County or an agency outside the jurisdiction covered by the Santa Ana Region MS4 Permit

Figure 1-1. Process to Complete Transportation Project BMP Template



Section 2: Project Information

The purpose of this section is to provide general project information and a description of the proposed project. The description should have sufficient detail to identify the project location, project boundaries and size, and, if classified as a Category 3 Project, the basis for the subcategorization (Capacity vs. Non-Capacity Roadway Improvement Project or non-adjoining Class I Bikeway or Sidewalk Project).

<table>
<tr><th colspan="6">Table 2.1 - Project Characteristics</th></tr>
<tr><td colspan="2">Project Name</td><td colspan="4">D3-0080 Good Hope Paving Project</td></tr>
<tr><td colspan="2">Project Owner/Operator (Agency)</td><td colspan="4">County of Riverside – Transportation Department</td></tr>
<tr><td colspan="2">Project Contact Name:</td><td colspan="4">Alfredo Martinez</td></tr>
<tr><td>Mailing Address:</td><td>3525 14th St, Riverside, CA. 92501</td><td>E-mail Address:</td><td>almartin@rivco.org</td><td>Telephone:</td><td>951-955-0086</td></tr>
<tr><td>Project Category</td><td colspan="5">Check the box for the applicable Project Category (See Table 1-1 in Guidance)

☐ Category 3 – Existing Transportation Project
☒ Category 4 – New Transportation Project</td></tr>
<tr><td colspan="6">Check the appropriate boxes below, based on the Project Category checked above</td></tr>
<tr><td rowspan="3">Category 3</td><td colspan="2">☐ Roadway Capacity Improvement Project</td><td colspan="3">☐ Lane additions
☐ Bridge project
☐ Grade separation project
☐ Other project type</td></tr>
<tr><td colspan="2">☐ Non-Capacity Roadway Improvement Project</td><td colspan="3">☐ Shoulder improvements
☐ Parking lane improvements
☐ Turn pocket addition
☐ Signal project that adds a turn lane
☐ Horizontal alignment correction (improve sight distance)
☐ Grade separation project
☐ Passing lane addition
☐ Turn out addition
☐ Other project type</td></tr>
<tr><td colspan="2">☐ Class I Bikeway or sidewalk</td><td colspan="3">☐ Improvement to existing Class I Bikeway or sidewalk
☐ Other project type</td></tr>
<tr><td>Category 4</td><td colspan="5">☒ New road project
☐ New bridge project
☐ New Class I Bikeway or sidewalk project</td></tr>
<tr><td colspan="6">Project Schedule:
Final Design Completed December 2024; Construction Start Summer 2025</td></tr>
</table>

Table 2.2 - Project Description

General Project Description:
In general, the project proposes to pave a 26' wide roadway above the new Olive Street Storm Drain System in the Community of Good Hope. The project will pave the following roadway segments:
Read Street – from Olympia Avenue to approx. 200' North of Mountain Avenue (approx. length of 1,500 ft)
Mountain Avenue – from approx. 300' West of Read Street to Baxter Street (approx. length of 1,000 ft)
Steele Peak Avenue – from approx.. 300' West of Read Street to Baxter Street (approx.. length of 1,000 ft)

In addition to the roadway paving, the project will also improve drainage through the use of dikes, area drains, and catch basins.

Incidental work will include signage, pavement striping/markings, driveway tie-ins, fence relocations, and utility adjustments.

Project Area (ft^2):	173,000	Project Length (ft):	3,500 ft	Coordinates of the approximate center of the project:	Latitude: 33.76340 Longitude: -117.28861

For Category 3 & 4 projects, complete the information below.

Describe how the existing surface footprint will be modified, if applicable	The existing surface consists of unpaved dirt roadway. The surface will be modified by regrading to accommodate a minimum 35 mph design speed. In addition to the grading, the roadway will be paved with new hot mix asphalt over class 2 aggregate base.
Describe how the capacity of the existing transportation surface (if any) will be improved	The capacity will remain unchanged; the existing dirt road currently accommodates two lanes of travel, one in each direction. The project will also accommodate two lanes of trave, one in each direction.
For a Class I Bikeway or sidewalk project, describe how the existing surface will be improved	N/A – no bike or sidewalk is proposed

Section 3: Regulatory Requirements & Site-Specific Chararacteristics

Describe the regulatory requirements and site-specific characteristics associated with the project site that can influence the selection of LID-based BMPs. Attach supporting information, as needed.

Table 3.1 – Regulatory Requirements & Site-Specific Characteristics	
Regulatory Requirements	
Consult Local Implementation Plan(s) to document pollutants of concern based on impaired waters listings or TMDL implementation requirements.	The State Water Quality Control Board does not list any 303(d) impaired water bodies in the project vicinity.
Document any known CEQA conditions, Multi-Species Habitat Conservation Plan, California Fish & Game Code Section 1600, CWA Section 401, or CWA Section 404 requirements	The project is within the Western Riverside County MSHCP but does not lie within any conservation lands, linkages, or biological corridors. The project will not affect any blue line streams so environmental permits will not be required.
Site-Specific Characteristics	
Drainage Area (ft^2)	92,000 sqft
Existing Site Impervious Area (ft^2)	0 sqft
Expected Post-Project Impervious Area (ft^2)	88,000 sqft
Hydrologic Soil Group* *Describe hydrologic soil group and associated infiltration characteristics, if known*	The USDA Web Soil Survey currently identified the majority of the project as having a Class C Hydrologic Soil Group, which have slow infiltration rates.
Expected Infiltration Characteristics *Describe known infiltration characteristics based on soil group or soil test data (attach if such data are available)*	See attached print out from USDA website. Approximately 13.8 % of the soil is classified as Class A which has high infiltration rates, the remainder of the project area is Class C or D with have slow to very slow infiltration
Natural Sediment Load Characteristics *Describe local sediment characteristics that could impact selection or functionality of BMPs*	Per the attached NPDES Memo, Sediment Load is considered Low
Depth to Groundwater *Determine depth to groundwater, if known (provide source of information*)	Based on the Geotechnical Report prepared by Riverside County Flood Control and Water Conservation District for their basin design, LB-14 thru 17 are near the project limits. No groundwater was encountered in borings which reached a depth of 20’ for LB-17.

* See soils section of the Flood Control District’s Hydrology Manual
http://floodcontrol.co.riverside.ca.us/downloads/planning/Hydrology%20Manual%20-%20Complete.pdf

Section 4: Infrastructure & Project-Specific Characteristics

Describe the existing infrastructure and project-specific characteristics associated with the project site that can influence the selection of LID-based BMPs. Attach supporting information, as needed; insert N/A for any element that is not applicable to the proposed project.

Table 4.1 - Infrastructure & Project-Specific Characteristics	
Programmatic & Funding Restrictions	
Project Funding *Provide information regarding project funding*	Project Budget: $2,848,000
	Funding Source: Gas Tax.HUTA
	Are there any limitations or restrictions on the use of dedicated funds: ☐ Yes; if this box checked, explain limitations ☒ No
Programmatic Constraints *Identify any programmatic or regulatory constraints, e.g., Americans with Disabilities Act; need for emergency access, etc.*	Does the project require compliance with other programmatic, regulatory, or code requirements that may affect application of BMPs? ☐ Yes; if this box checked, explain limitations ☒ No
Impaired Waters & TMDL Requirements	
Regulatory Constraints *Describe applicable BMP specific requirements to address impaired water related concerns*	Identify the MS4 Local Implementation Plan(s) consulted: There are no local implementation plans for this area Does the applicable LIP(s) identify any BMP requirements that need to be implemented in the project area: ☐ Yes; describe the BMP requirements and how they have been addressed in the project design: ☒ No
Right-of-Way (ROW)	
ROW Constraints *Describe potential ROW constraints to BMP implementation*	The Right of Way is limited in this area; due to the vertical curve corrections, most parkway adjacent to the proposed roadway will consist of 2:1 slopes which will leave little to no room for BMP implementation. Additional funding to purchase right of way is not available.
Drainage Connectivity	
Connectivity Constraints *Based on drainage features of the project site, describe potential constraints to BMP implementation*	Natural drainage to the site will mostly be intercepted by the Olive Street Storm Drain Project which proposes to construct 2 large inlets at the north and south ends of Read Street. The surface runoff from the project will also be designed to drain into the new storm drain system where practical.

Table 4.1 - Infrastructure & Project-Specific Characteristics

Utilities	
Utility Constraints *Identify any utility-related constraints*	Does the project have any utility constraints that that may affect application of BMPs? ☒ Yes; if this box checked, explain constraints There are a number of above ground and below grounds utilities adjacent to the road. There is limited right of way to relocate the existing utilities. Also, the utilities are very shallow, which adds a constraint to the BMPs that can be used. ☐ No
Resource Availability	
Irrigation Water *Describe availability of irrigation water to support BMPs that require establishment of landscaping*	The County of Riverside does not have a legal entity to support or maintain any landscape, irrigation or payment of water bills.
Power *Describe availability of power to support use of an irrigation system*	The County of Riverside does not have a legal entity in this area to support or maintain any power needed for landscaping or payment of power bills.
Estimated Road Use	
Vehicle Load *Describe the expected vehicle loads, e.g., H-20 truck loads, that will use the transportation surface after project completion*	The road is being design to residential road standards which has a Traffic Index of 7.0.
Maximum Allowable Speed (MAS) *Describe expected speed of vehicles on completed transportation surface; if variable, provide the MAS for different project elements*	The road is being design so that Mountain Avenue will have a posted speed limit of 35 mph while Read Street and Steele Peak Avenue will have a posted speed of 25 mph
Roadside Parking Requirements *Describe any minimum requirements associated with design of roadside parking areas*	Roadside parking areas are not required and will be restricted due to the proposed edge slopes adjacent to the roadway.
Capacity Design (Average Daily Traffic, ADT). Is the ADT ≥ 25,000?	☐ Yes ☒ No

Section 5: BMP Feasibility Analysis

Section 5.1 - Overview

Projects categorized as a Category 3 or Category 4 shall incorporate the following site design BMP principles to the maximum extent feasible:

- Conservation of natural areas to the extent feasible
- Minimization of the impervious footprint
- Minimization of disturbances to natural drainage
- Design and construction of pervious areas to receive runoff from impervious areas
- Use of landscaping that minimizes irrigation and runoff, promotes surface infiltration, and minimizes the use of pesticides and fertilizers

The extent to which these design principles may be incorporated into a project through the use of BMP techniques depends on the project type and the project-specific feasibility analysis. This section provides a stepwise approach for evaluating the feasibility to incorporate LID-based BMPs into a proposed project. Table 5.1 identifies the BMPs required for evaluation in relation to the project category or type. Based on the box checked the project reviewer is directed to the appropriate table for subsequent analyses. Table 5.2 provides sources for BMP planning and design information that may be considered for use in Transportation Projects. Table 5.3 provides a checklist for LID BMP feasibility analysis for Category 3 or 4 projects, and Table 5.4 provides a similar checklist applicable to Class I Bikeway or Sidewalk Projects analysis.

Section 5.2 – BMP References

To support completion of the feasibility analyses for each LID-based BMP in Table 5.3, Table 5.2 provides sources for BMP design information that may be considered for use in Transportation Projects. These information sources are intended to guide decision-making with regards to making feasibility determinations about the efficacy of incorporating LID-based BMPs in the project design. Additional general information regarding the use of LID-based BMPs in Transportation Projects may be found in Section 6.C of the Guidance.

The resource information provided in Table 5.2 does not represent an exhaustive list of source material regarding LIP-based BMPs; in fact, new information regarding how to design LID-based BMPs is regularly published. In addition, this information is not to be used as a substitute for development of engineering designs appropriate to the project site.

Table 5.1 - LID BMP Evaluation Requirements	
Check the appropriate box. The LID BMPs listed within each category must be included in the feasibility analysis	
☒ **Category 3 or 4 (other than a Class I Bikeway or sidewalk project)** ▪ 1 - Minimum Road Width ▪ 2 - Drainage Swales ▪ 3 – Infiltration Basins ▪ 4 - Bioretention ▪ 5 - Sidewalk Trees and Tree Boxes ▪ 6 - Permeable Pavement	☐ **Class I Bikeway or Sidewalk Project** ▪ Drain to Pervious Surfaces ▪ Minimum Width ▪ Use of Tree Wells ▪ Permeable Pavement
▪ If the Category 3 or 4 box was checked above, complete the feasibility analysis for <u>each</u> of the LID BMPs in Table 5.3 ▪ If the Class I Bikeway or Sidewalk project box was checked, complete Table 5.4	

Table 5.2 – BMP Design Information

LID-based BMP Information Source	Minimum Street Width	Drainage Swales	Infiltration Basins	Bioretention	Sidewalk Trees & Tree Boxes	Permeable Pavement
Riverside County Flood Control and Water Conservation District Design Handbook for Low Impact Development Management Practices http://rcflood.org/NPDES/LIDBMP.aspx	--	--	Section 3.1	Section 3.5	Section 3.5, p. 5[1]	Section 3.3
Low Impact Development Manual for Southern California: Technical Guidance and Site Planning Strategies https://www.casqa.org/resources/california-lid-gi/socal-lid-manual	--	pp. 137-138	--	pp. 68-84	p. 71[1]	pp. 83-113
U. S. EPA Municipal Handbook: Green Streets, Managing Wet Weather with Green Infrastructure[1] https://www.epa.gov/sites/default/files/2015-10/documents/gi_munichandbook_green_streets_0.pdf	pp. 2-4	--	--	--	--	--
County of San Diego, Low Impact Development Handbook: Stormwater Management Strategies https://www.sandiegocounty.gov/content/dam/sdc/pds/docs/LID_Handbook_2014.pdf (General Information) http://www.sdcounty.ca.gov/dplu/docs/LID-Appendices.pdf (Fact Sheets)	Fact Sheet 14, 15	--	--	Fact Sheets 15, 19	--	pp. 46-51, Fact Sheets 8, 9, 10
County of Los Angeles Low Impact Development Standards Manual. https://dpw.lacounty.gov/ldd/lddservices/docs/Low_Impact_Development_Standards_Manual.pdf	--	--	--	--	pp. 49-52[1]	pp. 53-57
City of Santa Barbara Storm Water BMP Guidance Manual https://sbparksandrec.santabarbaraca.gov/sites/default/files/documents/Parks%20%26%20Recreation/Creeks/Final%20Guidance%20Manual.pdf	--	Section 6.6.2	--	Section 6.6.1	Section 6.9.2[1]	Section 6.8
Caltrans Treatment Control BMP Technology Report https://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/caltrans/annual_rpts/fy1718/annual_report_fy2017_2018/att_bmp_technology_rpt.pdf	--	p. D-5	--	pp. B-11 – B-12	pp. B-7 – B-10	--
Evaluation of Best Management Practices for Highway Runoff Control: *Low Impact Development Design Manual for Highway Runoff Control* https://coralreef.gov/assets/transportation/evalbmp.pdf	--	Section 14	--	Section 5	--	Section 10

[1] Handbook provides information on all LID types except Infiltration Basins, but information is general in nature

Table 5.3 – LID BMP Feasibility Analysis 1 – Minimum Road Widths	
1.a - Does the project need to meet jurisdictional code or General Plan requirements for minimum road widths?	☐ Yes; if checked, describe requirements ☒ No
1.b – Based on the findings of 1.a., determine if this BMP can be applied to the project. If applicable, describe how it was incorporated into the project design.	☒ Applicable, describe design features incorporating this BMP; The proposed design does not meet General Plan Standards for the roadways. Mountain Ave is classified as a Secondary Highway with a roadway width of 64' from curb to curb. Steele Peak Ave and Read St are classified as local roads which have a minimum curb to curb width of 36'. The project proposes to minimize the impervious areas as all streets will be designed to be 26' wide. ☐ Not Applicable, describe basis for decision (e.g., project requirements, traffic or pedestrian safety concerns)

Table 5.3 – LID BMP Feasibility Analysis 2 – Drainage Swales	
2.a – Are there any programmatic constraints that prevent the use of this BMP, *e.g., Americans with Disabilities Act; need for emergency access, funding restrictions, etc.? See Section 3.b of the Guidance.*	☐ Yes; if checked, provide basis for finding and STOP; ☒ No; BMP is potentially feasible, continue to 2.b
2.b - Considering grade and need for drainage connectivity, is there sufficient ROW for proper swale installation?	☒ No; if checked, provide basis for finding Right of Way is limited and the construction of the side slopes do not provide room for any drainage swales ☐ Yes
2.c - Can drainage swales be sized large enough to capture site run-on and redirect it into the drainage system?	☒ No; if checked, provide basis for finding There is not enough RIght of Way to carry the flows in drainage swales. The design currently uses asphalt dikes at the edge of pavement to convey water ☐ Yes
2.d - Are existing soil characteristics sufficient to support infiltration such that nuisance or vector conditions are not created by any ponded water that may occur?	☒ No; if checked, provide basis for finding The majority of the area adjacent to the project site has a hydraulic soil classification of C or D which indicates low to very low infiltration ☐ Yes
• If "No" is checked for 2.b, 2.c, <u>or</u> 2.d, then STOP - this BMP is infeasible; attach appropriate documentation support as needed • If "Yes" is checked for 2.b, 2.c, <u>and</u> 2.d, then this BMP is potentially feasible, continue on to 2.e and 2.f	
2.e - Are irrigation water and power available to support vegetation in swale during dry periods?	☐ No; if checked, provide basis for finding ☐ Yes
2.f - If irrigation water and power are not available, can the site support native vegetation that does not require irrigation?	☐ No; if checked, provide basis for finding ☐ Yes
• If "No" is checked for 2.e <u>and</u> 2.f, this BMP is infeasible • If "Yes" is checked for 2.e <u>or</u> 2.f, then this BMP is potentially feasible; continue to 2.g	
2.g – Are there any special maintenance, equipment, or experience requirements associated with the implementation of this BMP?	☐ Yes; if checked, provide basis for finding and determine whether the findings prevent implementation of this BMP ☐ No
2.h – If this BMP is implemented, will there be any one-time capital costs incurred, e.g., for new equipment required to maintain the BMP, that impacts project funding?	☐ Yes; if checked, provide basis for finding and determine whether the findings prevent implementation of this BMP ☐ No
2.i – Is there long-term funding available to maintain this BMP?	☐ Yes ☐ No
• If any of the findings from 2.g, 2.h <u>or</u> 2.i prevent the use of this BMP, then this BMP is infeasible; attach appropriate documentation as needed • If the findings from 2.g., 2.h, <u>and</u> 2.i do not prevent implementation of this BMP, then the BMP is feasible; incorporate into Table 7.1	

Table 5.3 – LID BMP Feasibility Analysis 3 – Infiltration Basins	
3.a – Are there any programmatic constraints that prevent the use of this BMP, *e.g., Americans with Disabilities Act; need for emergency access, funding restrictions, etc.? See Section 3.b of the Guidance.*	☒ Yes; if checked, provide basis for finding and STOP; this BMP is infeasible The Right of Way cannot accomodate the construciton of an inflitration basin, and the project does not have additional funding to purchase Right of Way ☐ No; BMP is potentially feasible, continue to 3.b
3.b - Do appropriate soil conditions exist at the project site to allow effective infiltration consistent with a drawdown period, not to exceed 72 hours?	☐ No; if checked, provide basis for finding ☐ Yes
3.c - Is there at least 10 feet separation between the planned basin invert and the measured groundwater elevation?	☐ No; if checked, provide basis for finding ☐ Yes
3.d- Is there at least 100 feet separation from the proposed basin(s) and any known water supply wells?	☐ No; if checked, provide basis for finding ☐ Yes
3.e - Is the underlying soil and/or groundwater free from any known contamination?	☐ No; if checked, provide basis for finding ☐ Yes
3.f - Is there sufficient space to size or place an infiltration basin that: • Has slopes that are no steeper than 4:1, <u>and</u> • Is located at least 100 feet from bridge structures?	☐ No; if checked, provide basis for finding ☐ Yes
3.g - For a project area that has high vehicular traffic (25,000 or more average daily traffic), can the planned infiltration basin meet the MS4 Permit's pretreatment of runoff requirements?	☐ No; if checked, provide basis for finding ☐ Yes
3.h - Can an infiltration basin be incorporated into the site plan in a manner that does not create traffic or pedestrian safety concerns?	☐ No; if checked, provide basis for finding ☐ Yes
3.i - Does inclusion of an infiltration basin detract from the aesthetics of the roadway or project area that cannot be mitigated?	☐ No; if checked, provide basis for finding ☐ Yes
• If "No" is checked for any of the above questions (3.b – 3.i), this BMP is infeasible • If "Yes" is checked for all of the above (3.b - 3.i), then this BMP is potentially feasible; continue to 3.j	
3.j – Are there any special maintenance, equipment, or experience requirements associated with the implementation of this BMP?	☐ Yes; if checked, provide basis for finding and determine whether the findings prevent implementation of this BMP ☐ No
3.k – If this BMP is implemented, will there be any one-time capital costs incurred, e.g., for new equipment required to maintain the BMP, that impacts project funding?	☐ Yes; if checked, provide basis for finding and determine whether the findings prevent implementation of this BMP ☐ No
3.l – Is there long-term funding available to maintain this BMP?	☐ Yes ☐ No
• If any of the findings from 3.j, 3.k <u>or</u> 3.l prevent the use of this BMP, then this BMP is infeasible; attach appropriate documentation as needed • If the findings from 3.j., 3.k, <u>and</u> 3.l do not prevent implementation of this BMP, then the BMP is feasible; incorporate into Table 7.1	

Table 5.3 – LID BMP Feasibility Analysis 4 – Bioretention	
4.a – Are there any programmatic constraints that prevent the use of this BMP, *e.g., Americans with Disabilities Act; need for emergency access, funding restrictions, etc.? See Section 3.b of the Guidance.*	☒ Yes; if checked, provide basis for finding and STOP; this BMP is infeasible To construct a bioretention BMP we would need to have readily available water and power to maintain it for a long period of time, and we do not have funding allocated for operation and maintenance. ☐ No; BMP is potentially feasible, continue to 4.b
4.b - Is there sufficient ROW to consider curb extensions?	☐ No; if checked, provide basis for finding ☐ Yes
4.c - Is there sufficient ROW to consider sidewalk planters?	☐ No; if checked, provide basis for finding ☐ Yes
4.d – Is there sufficient space to consider using the road median for bioretention?	☐ No; if checked, provide basis for finding ☐ Yes
• If "No" is checked for 4.b, 4.c <u>and</u> 4.d, then STOP - this BMP is infeasible; attach appropriate documentation support as needed • If "Yes" is checked for 4.b, 4.c <u>or</u> 4.d, then this BMP is potentially feasible, continue on to 4.e	
4.e – Can the site be designed so that median, curb extensions or sidewalk planters tie into the existing drainage at the project site?	☐ No; if checked, provide basis for finding ☐ Yes
• If "No" is checked for 4.e, then STOP - this BMP is infeasible; attach appropriate documentation support as needed • If "Yes" is checked for 4.e, then this BMP is potentially feasible, continue on to 4.f and 4.g	
4.f - Are irrigation water and power available to support bioretention area or sidewalk planters?	☐ No; if checked, provide basis for finding ☐ Yes
4.g - If irrigation water and power are not available, can the site support native vegetation that does not require irrigation?	☐ No; if checked, provide basis for finding ☐ Yes
• If "No" is checked for 4.f <u>and</u> 4.g, then STOP - this BMP is infeasible • If "Yes" is checked for 4.f <u>or</u> 4.g, then this BMP is potentially feasible; continue on to 4.h	
4.h – Based on anticipated traffic capacity and MAS applicable to the project site, are there any traffic or pedestrian safety concerns that prevent application of this BMP?	☐ Yes; if checked, provide basis for finding ☐ No
• If "Yes" is checked for 4.h this BMP is infeasible • If "No" is checked for 4.h, then this BMP is potentially feasible; continue to 4.i.	
4.i – Are there any special maintenance, equipment, or experience requirements associated with the implementation of this BMP?	☐ Yes; if checked, provide basis for finding and determine whether the findings prevent implementation of this BMP ☐ No
4.j – If this BMP is implemented, will there be any one-time capital costs incurred, e.g., for new equipment required to maintain the BMP, that impacts project funding?	☐ Yes; if checked, provide basis for finding and determine whether the findings prevent implementation of this BMP ☐ No
4.j – Is there long-term funding available to maintain this BMP?	☐ Yes ☐ No
• If any of the findings from 4.i, 4.j <u>or</u> 4.k prevent the use of this BMP, then this BMP is infeasible; attach appropriate documentation as needed • If the findings from 4.i, 4.j, <u>and</u> 4.k do not prevent implementation of this BMP, then the BMP is feasible; incorporate into Table 7.1	

Table 5.3 – LID BMP Feasibility Analysis 5 – Sidewalk Trees and Tree Boxes	
5.a – Are there any or programmatic constraints that prevent the use of this BMP, *e.g., Americans with Disabilities Act; need for emergency access, funding restrictions, etc.? See Section 3.b of the Guidance.*	☒ Yes; if checked, provide basis for finding and STOP; this BMP is infeasible To construct a Sidewalk Tree and Tree Box BMP we would need to have readily available water and power to maintain it for a long period of time, and we do not have funding allocated for operation and maintenance. ☐ No; BMP is potentially feasible, continue to 5.b
5.b - Is there sufficient ROW to incorporate sidewalk trees or tree boxes into the project site?	☐ No; if checked, provide basis for finding ☐ Yes
• If "No" is checked for 5.b, then STOP - this BMP is infeasible; attach appropriate documentation support as needed • If "Yes" is checked for 5.b, then this BMP is potentially feasible, continue on to 5.c and 5.d	
5.c - Are irrigation water and power available to support vegetation in the bioretention area or sidewalk planters?	☐ No; if checked, provide basis for finding ☐ Yes
5.d - If irrigation water and power are not available, can the site support native vegetation that does not require irrigation?	☐ No; if checked, provide basis for finding ☐ Yes
• If "No" is checked for 5.c <u>and</u> 5.d, then STOP - this BMP is infeasible • If "Yes" is checked for 5.c <u>or</u> 5.d, then this BMP is potentially feasible; continue on to 5.e	
5.e – Based on anticipated traffic capacity and MAS applicable to the project site, are there any traffic or pedestrian safety concerns that prevent application of this BMP?	☐ Yes; if checked, provide basis for finding ☐ No
• If "Yes" is checked for 5.e this BMP is infeasible • If "No" is checked for 5.e, then this BMP is potentially feasible; continue to 5.f	
5.f – Are there any special maintenance, equipment, or experience requirements associated with the implementation of this BMP?	☐ Yes; if checked, provide basis for finding and determine whether the findings prevent implementation of this BMP ☐ No
5.g – If this BMP is implemented, will there be any one-time capital costs incurred, e.g., for new equipment required to maintain the BMP, that impacts project funding?	☐ Yes; if checked, provide basis for finding and determine whether the findings prevent implementation of this BMP ☐ No
5.h – Is there long-term funding available to maintain this BMP?	☐ Yes ☐ No
• If any of the findings from 5.f, 5.g <u>or</u> 5.h prevent the use of this BMP, then this BMP is infeasible; attach appropriate documentation as needed • If the findings from 5.f, 5.g <u>and</u> 5.h do not prevent implementation of this BMP, then the BMP is feasible; incorporate into Table 7.1	

Table 5.3 – LID BMP Feasibility Analysis 6 – Permeable Pavement	
6.a – Are there any or programmatic constraints that prevent the use of this BMP, *e.g., Americans with Disabilities Act; need for emergency access, funding restrictions, etc.? See Section 3.b of the Guidance.*	☒ Yes; if checked, provide basis for finding; STOP, this BMP is infeasible To maintain Permeable Pavement, regular vacuuming of the pavement is required to keep the asphalt porous. Transportation Maintenance does not have the equipment necessary to maintain this bmp ☐ No; BMP is potentially feasible, continue to 6.b
6.b - Does the planned road project include any of the listed types of impervious surfaces (check all that apply)?	☐ Roadside parking/parking lane ☐ Driveways ☐ Sidewalks, walkways ☐ None of the above
• If "none of the above" is checked in 6.b, then STOP – BMP is infeasible • If any box other than "none of the above" is checked, BMP is potentially feasible; continue to 6.c	
6.c – Will any of the transportation surfaces checked in 6.b be subject to high traffic volume or heavy traffic loads that prevent the use of permeable pavement?	☐ Yes; if checked, provide basis for finding ☐ No
6.d – Do the underlying soils at the project site provide adequate infiltration capacity for use of this BMP while not causing structural concerns?	☐ No; if checked, provide basis for finding ☐ Yes
• If "Yes" is checked for 6.c <u>or</u> "No" is checked for 6.d, then STOP - this BMP is infeasible; attach appropriate documentation support as needed • If "No" is checked for 6.c <u>and</u> "Yes" is checked for 6.d, then this BMP is potentially feasible for all impervious surface types checked in 6.b; continue to 6.e • If "Yes" is checked for 6.c <u>and</u> 6.d <u>and</u> "sidewalks, walkways" was checked in 6.b, then this BMP is potentially feasible for sidewalk or walkway elements of the project; continue to 6.e	
6.e – Are there any special maintenance, equipment, or experience requirements associated with the implementation of this BMP?	☐ No; if checked, provide basis for finding and determine whether the findings prevent implementation of this BMP ☐ Yes
6.f – Will the BMP maintain an adequate service life (at least 5 years) such that the BMP is economically feasible?	☐ No; if checked, provide basis for finding and determine whether the findings prevent implementation of this BMP ☐ Yes
6.g – If this BMP is implemented, will there be any one-time capital costs incurred, e.g., for new equipment required to maintain the BMP, that impacts project funding?	☐ Yes; if checked, provide basis for finding and determine whether the findings prevent implementation of this BMP ☐ No
6.h – Is there long-term funding available to maintain this BMP?	☐ Yes ☐ No
• If any of the findings from 6.e, 6.f, 6.g <u>or</u> 6.h prevent the use of this BMP, then this BMP is infeasible; attach appropriate documentation as needed • If the findings from 6.e, 6.f, 6.g <u>and</u> 6.h do not prevent implementation of this BMP, then the BMP is feasible; incorporate into Table 7.1	

Table 5.4 – LID BMP Feasibility Analysis – Class I Bikeway and Sidewalks	
1 - Has the Class I Bikeway or sidewalk been designed to sheet-flow runoff onto adjacent permeable areas in a manner that will maximize opportunities for infiltration and filtration, while not channelizing or causing erosion?	☐ Yes; if checked, provide basis for finding, incorporate BMP into Table 7.1 ☐ No; if checked, provide basis for finding; continue on to Question 2.
2 - Has the Class I Bikeway or sidewalk been designed using the minimum width possible, given expected usage and considering public safety?	☐ Yes; if checked, provide basis for finding; incorporate BMP into Table 7.1; continue on to Questions 3 and 4. ☐ No; if checked, provide basis for finding; continue on to Questions 3 and 4.
3 - If trees are incorporated into the design of the Bikeway or sidewalk, have tree boxes been used?	☐ Yes; if checked, provide basis for finding; incorporate BMP into Table 7.1 ☐ No; if checked, provide basis for finding
4 - Do the underlying soils at the project site provide adequate infiltration capacity for use of some type of permeable pavement?	☐ No; if checked, BMP is infeasible; provide basis for finding ☐ Yes; if checked, continue on to Question 5
5 – Are there any project funding or programmatic constraints that prevent the use of permeable pavement in the project design, *e.g., Americans with Disabilities Act; need for emergency access, funding restrictions, etc.*?	☐ Yes; if checked, BMP is infeasible; provide basis for finding ☐ No; if checked, continue on to Question 6
6 – Are there any maintenance requirements, including long-term funding, that prevent the use of permeable pavement in the project design?	☐ Yes; if checked, BMP is infeasible; provide basis for finding ☐ No; if checked, include permeable pavement in the project design and incorporate the BMP into Table 7.1

Section 6: Source Control BMPs

Section 6 identifies source control BMPs potentially applicable to the proposed project. If this is strictly a road project, then only Part 1 needs to be filled out. Part 2 needs to be filled out if the road project includes bike path or sidewalk features adjoining or non-adjoining the road surface, or if the proposed project is only a Class I Bikeway or sidewalk project. The project reviewer should evaluate the applicability of each source control BMP and identify the agency responsible for implementing the BMPs once the project is constructed.

Table 6.1 - Source Control BMPs

Source Control BMP	Check One		If not Included, Provide Basis	If Included, Agency Responsible for Implementation
	Included	Not Included		
Part 1: Category 3 or 4 Projects (other than Class I Bikeway or sidewalk projects)				
Irrigation System and Landscape Maintenance	☐	☒	Generally, Irrigation and Landscape Maintenance falls to a CFD and not Transportation Maintenance. No CFD exists in this area	
Sweeping of Transportation Surfaces adjoining curb and gutter	☒	☐		Transportation will begin to sweep the road after it has been added to the County Maintained Road System
Drainage Facility Inspection and Maintenance	☒	☐		Transportation will perform inspection and maintenance on proposed inlets; SD system to be maintained and inspected by Flood Control
MS4 Stenciling and Signage	☒	☐		Transportation will maintain MS4 stenciling and signage
Landscape and Irrigation System Design	☐	☒	Generally, Irrigation and Landscape Maintenance falls to a CFD and not Transportation Maintenance. No CFD exists in this area	
Protect Slopes and Channels	☒	☐		Slope stabilization will be included in the construction of the project and will be performed by Contractor
Part 2: Class I Bikeway and Sidewalk Projects				
Public Education Program	☐	☐		
Use of Signage	☐	☐		
Installation and Maintenance of Trash Bins and Pet Waste Collection Bags	☐	☐		

Section 7: Project Summary

Table 7.1 summarizes and documents (a) applicability and use of LID-based BMPs in the project design; (b) applicable source control BMPs, and (c) known regulatory requirements that impacted the project design. Fill out the information relevant to the project type and provide supporting information where needed. Continue to Section 8 on the following page for the steps to follow for applicable projects to appropriately size proposed BMP(s).

Table 7.1 – Project Summary (Category 3 & 4 Projects)

☒ **Category 3 or Category 4 Project (other than Class I Bikeway or sidewalk projects)** Summarize the LID BMPs incorporated into the project design (based on the findings of the Table 5.3 - LID BMP Feasibility Analysis). For each LID BMP checked: ▪ Describe briefly how the LID BMP was incorporated; and ▪ Provide references to attachments or design plans (e.g., sheet numbers) where needed to support description	☒ Minimum Road Width	
	☐ Drainage Swales	Maintenance Responsibility:
	☐ Infiltration Basins	Maintenance Responsibility:
	☐ Bioretention	Maintenance Responsibility:
	☐ Sidewalk Trees and Tree Boxes	Maintenance Responsibility:
	☐ Permeable Pavement	Maintenance Responsibility:
☐ **Class 1 Bikeway and Sidewalk Projects** Summarize the LID BMPs incorporated into the project design (based on the Table 5.4 - LID BMP Feasibility Analysis). For each BMP checked: ▪ Describe briefly how the LID BMP was incorporated; and ▪ Provide references to attachments or design plans (e.g., sheet numbers) as needed to support description	☐ Drain to Pervious Surfaces	
	☐ Minimum Width	
	☐ Use of Tree Wells	Maintenance Responsibility:
	☐ Permeable Pavement	Maintenance Responsibility:
Regulatory Requirements Document design elements that address any known regulatory requirements (see Table 3.1); if none, check the N/A box.	☐ Design elements affected by regulatory requirements Describe: ☒ N/A	
Source Control BMPs Summarize the applicable source controls and the agency responsible for implementation	Transportation Department will be responsible for street sweeping, drainage facility inspection and maintenance, MS4 stencilling and signage, and slope protection.	
Documentation List all attachments that support this project summary		

Section 8: BMP Sizing for Applicable Green Streets Projects

*NOTE: **All** documentation and analyses used in this section shall be provided in Appendix A, Project BMP Sizing Documentation.*

The following steps are used to size previously selected BMPs (e.g. LID and Treatment Control) for **Category 3 and 4** projects:

1. Delineate drainage areas tributary to proposed BMP locations and compute imperviousness.

2. Using the information provided in Table 5.2 above, look up the recommended sizing method for the BMP selected in each drainage area and calculate target sizing criteria (e.g., Design Capture Volume).

3. Using the information provided in Table 5.2 above, appropriately design your BMP(s) per the provided guidance links.

4. Attempt to provide the calculated sizing criteria for the selected BMPs.

5. If sizing criteria cannot be achieved, document the constraints that override the application of BMPs, and provide the largest portion of the sizing criteria that can be reasonably provided given constraints.

If BMPs cannot be sized to provide the calculated volume for the tributary area, it is still essential to design the BMP inlet, energy dissipation, and overflow capacity for the full tributary area to ensure that flooding and scour is avoided. It is strongly recommended that BMPs which are designed to less than their target design volume be designed to bypass peak flows.

For those **Category 4** projects that cannot meet the sizing criteria, notification to the Santa Ana Regional Water Quality Control Board – Inland Stormwater Unit is required. Notification must include a cover letter justifying why your **Category 4** project cannot meet the sizing criteria and needs to include the feasibility analysis used to reach that conclusion. A copy of this notification must also be included in Appendix A, below.

Appendix A: Project BMP Sizing Documentation