The Metropolitan Water District of Southern California

Agenda

The mission of the Metropolitan Water District of Southern California is to provide its service area with adequate and reliable supplies of high-quality water to meet present and future needs in an environmentally and economically responsible way.

OW&S Committee
T. Quinn, Chair
S. Faessel, Vice Chair
L. Ackerman
D. Alvarez
J. Armstrong
A. Chacon
G. Cordero
D. De Jesus
D. Erdman
L. Fong-Sakai
S. Goldberg
C. Kurtz
R. Lefevre
C. Miller
M. Petersen
G. Peterson
B. Pressman
N. Sutley

One Water and Stewardship Committee - Final

Meeting with Board of Directors *

September 11, 2023

2:00 p.m.

Monday, September 11, 2023
Meeting Schedule

09:30 a.m. EOT
11:30 a.m. EOP
01:30 p.m. Break
02:00 p.m. OWS

Agendas, live streaming, meeting schedules, and other board materials are available here: https://mwdh2o.legistar.com/Calendar.aspx. A listen-only phone line is available at 1-877-853-5257; enter meeting ID: 891 1613 4145. Members of the public may present their comments to the Board on matters within their jurisdiction as listed on the agenda via in-person or teleconference. To participate via teleconference 1-833-548-0276 and enter meeting ID: 815 2066 4276 or click https://us06web.zoom.us/j/81520664276pwd=a1RTQWh6V3h3ckFhNmdsUWpKR1c2Zz09

MWD Headquarters Building • 700 N. Alameda Street • Los Angeles, CA 90012
Teleconference Locations:
Covina Irrigating Company • 146 E. College Street • Covina, CA 91723
525 Via La Selva • Redondo Beach, CA 90277
Cedars Sinai Medical Center • 8700 Beverly Blvd • Los Angeles, CA 90048
3008 W. 82nd Place • Inglewood, CA 90305
Long Beach Utilities Department • 1800 East Wardlow Road • Long Beach, CA 90807

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* The Metropolitan Water District's meeting of this Committee is noticed as a joint committee meeting with the Board of Directors for the purpose of compliance with the Brown Act. Members of the Board who are not assigned to this Committee may participate as members of the Board, whether or not a quorum of the Board is present. In order to preserve the function of the committee as advisory to the Board, members of the Board who are not assigned to this Committee will not vote on matters before this Committee.

1. Opportunity for members of the public to address the committee on matters within the committee's jurisdiction (As required by Gov. Code Section 54954.3(a))

**** CONSENT CALENDAR ITEMS -- ACTION ****

2. CONSENT CALENDAR OTHER ITEMS - ACTION

US 2-456

A. Approval of the minutes of the One Water and Stewardship Committee for August 14, 2023 (Copies have been submitted to each Director, Any additions, corrections or omissions) **21-2435**

Attachments: 09112023 OWS 2A (081420234) Minutes

3. CONSENT CALENDAR ITEMS - ACTION

7-4 Review and consider the Eastern Municipal Water District's certified Final Environmental Impact Report and Addendum, and take related CEQA actions; Authorize the General Manager to enter into a Local Resources Program Agreement with Eastern Municipal Water District for the French Valley Recycled Water Distribution System Project for up to 140 acre-feet per year of recycled water for irrigation use in the Eastern Municipal Water District's service area **21-2594**

Attachments: 09122023 OWS 7-4 B-L
09122023 OWS 7-4 Presentation

**** END OF CONSENT CALENDAR ITEMS ****

4. OTHER BOARD ITEMS - ACTION

8-2 Authorize payments, by a two-thirds vote, of up to $4.16 million for participation in the State Water Contractors for FY 2023/24; the General Manager has determined the proposed action is exempt or otherwise not subject to CEQA **21-2598**

Attachments: 09122023 OWS 8-2 B-L
09122023 OWS 8-2 Presentation Revised
09112023 OWS 8-2 State Water Contractors and Table A amounts

8-3 Review and consider the Addenda Nos. 1, 2, and 3 to the Mitigated Negative Declaration previously adopted by the Antelope Valley-East Kern Water Agency for the High Desert Water Bank; approve changes to the design, construction, and operation of Water Bank facilities; and authorize up to $80 million for additional costs associated with these changes; the General Manager has determined that a portion of the proposed action is exempt or otherwise not subject to CEQA **21-2558**

Attachments: 09122023 OWS 8-3 B-L
09122023 OWS 8-3 Presentation Revised

5. BOARD INFORMATION ITEMS

NONE

6. COMMITTEE ITEMS

a. Update on Conservation Budget and Expenditure **21-2619**

Attachments: 09112023 OWS 6a Presentation

b. Information on Round 3 Future Supply Action Funding Program **21-2620**

Attachments: 09112023 OWS 6b Presentation

c. Update on Conservation **21-2622**

Attachments: 09112023 OWS 6c Presentation

7. MANAGEMENT REPORTS

a. Colorado River Manager's Report **21-2437**

Attachments: 09122023 OWS 7a Report

b. Bay-Delta Manager's Report **21-2438**

Attachments: 09122023 OWS 7b Report
09112023 OWS 7b Presentation

c. Water Resource Management Manager's Report **21-2439**

Attachments: 09112023 OWS 7c Presentation

d. Chief Sustainability, Resilience and Innovation Officer's Report **21-2621**

Attachments: 09122023 OWS 7d Presentation

8. SUBCOMMITTEE REPORTS AND DISCUSSION

a. Discuss and provide direction to Subcommittee on Bay-Delta **21-2631**

b. Discuss and provide direction to Subcommittee on Demand Management and Conservation Programs and Priorities **21-2632**

9. FOLLOW-UP ITEMS

NONE

10. FUTURE AGENDA ITEMS

11. ADJOURNMENT

NOTE: This committee reviews items and makes a recommendation for final action to the full Board of Directors. Final action will be taken by the Board of Directors. Committee agendas may be obtained on Metropolitan's Web site https://mwdh2o.legistar.com/Calendar.aspx. This committee will not take any final action that is binding on the Board, even when a quorum of the Board is present.

Writings relating to open session agenda items distributed to Directors less than 72 hours prior to a regular meeting are available for public inspection at Metropolitan's Headquarters Building and on Metropolitan's Web site https://mwdh2o.legistar.com/Calendar.aspx.

Requests for a disability-related modification or accommodation, including auxiliary aids or services, in order to attend or participate in a meeting should be made to the Board Executive Secretary in advance of the meeting to ensure availability of the requested service or accommodation.

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

MINUTES

ONE WATER AND STEWARDSHIP COMMITTEE

August 14, 2023

Chair Quinn called the meeting to order at 2:00 p.m.

Members present: Directors Ackerman, Alvarez, Armstrong, Chacon, Cordero, De Jesus (teleconference posted location), Erdman, Faessel, Fong-Sakai, Goldberg, Kurtz, Lefevre, Miller, Peterson (teleconference posted location), Pressman (entered after roll call, teleconference posted location), Quinn and Sutley.

Members Absent: Directors Petersen.

Other Board Members present: Abdo, Bryant, Dennstedt, Fellow, Garza, Luna, McCoy, McMillan, Morris, Ortega, Seckel, and Smith.

Committee staff present: Coffey, Crosson, Hasencamp, Hawk, Munguia, Neudeck, Schlotterbeck, Upadhyay, and Wheeler.

1. OPPORTUNITY FOR MEMBERS OF THE PUBLIC TO ADDRESS THE COMMITTEE ON MATTERS WITHIN THE COMMITTEE'S JURISDICTION (AS REQUIRED BY GOV. CODE SECTION 54954.3(A))

Public speakers included:

1. Maura Monagan, Los Angeles Waterkeeper spoke in support of item 7-4.

2. SUBCOMMITTEE REPORTS

None

Director Pressman entered the meeting.

Director Quinn announced that Agenda item 3a would be conducted with the rest of the Consent Calendar Items following staff presentations.

CONSENT CALENDAR ITEMS -- ACTION

3. CONSENT CALENDAR OTHER ITEMS – ACTION

a. Approval of the Minutes of the One Water and Stewardship Committee for July 10, 2023.

Director Miller requested a vote separately on Agenda item 7-3.

4. CONSENT CALENDAR ITEMS – ACTION

7-3 Subject: Authorize amendments to the Cyclic Cost-Offset Program terms; the General Manager has determined that the proposed action is exempt or otherwise not subject to CEQA

Presented by: Anna Garcia, Associate Engineer, Water Resource Management

Motion: Authorize amendments to the Cyclic Cost-Offset Program terms

Amended Motion: Authorize amendments to the Cyclic Cost-Offset Program terms and authorize the general manager to execute other agreements, including surface storage, that achieve the same benefits under the same financial terms and conditions.

Mr. Coffey provided brief background information and introduced Ms. Garcia.

Ms. Garcia gave a presentation that explained the proposed modifications to the Cyclic Cost-Offset Program terms.

The following Directors provided comments or asked questions:

1. Smith
2. Peterson
3. Kurtz
4. Pressman
5. Goldberg
6. Sutley
7. Armstrong
8. Ortega
9. Seckel

Staff responded to Directors' questions and comments.

After completion of the presentation and a committee discussion, Director Miller made a motion, seconded by Director Lefevre, to approve option #1 as amended, *Authorize amendments to the Cyclic Cost-Offset Program terms and authorize the general manager to execute other agreements, including surface storage, that achieve the same benefits under the same financial terms and conditions.*

Committee members actively discussed the amended motion introduced by Director Miller. Because of uncertainty around the inclusion of surface water, this amendment clarifies that surface-water storage within the service area is included in the Cyclic Cost-Offset Program.

The vote was:

Ayes:	Directors Ackerman, Alvarez, Armstrong, Chacon, Cordero, De Jesus, Erdman, Faessel, Fong-Sakai, Goldberg, Kurtz, Lefevre, Miller, Pressman, Quinn and Sutley.
Noes:	Director Peterson
Abstentions:	None
Absent:	Director Petersen

The motion for item 7-3 passed by a vote of 16 ayes, 1 no, 0 abstentions, and 1 absent.

7-4 Subject: Authorize implementation of a tree rebate modification to the Turf Replacement Program; the General Manager has determined that these actions are exempt or otherwise not subject to CEQA

Presented by: None.

Motion: Authorize implementation of the tree rebate option for the Turf Replacement Program

The committee elected to not hear this presentation.

Director Alvarez made a motion, seconded by Director Peterson to approve the remaining Consent Calendar items 3a and 7-4.

The vote was:

Ayes:	Directors Ackerman, Alvarez, Armstrong, Chacon, Cordero, De Jesus, Erdman, Faessel, Fong-Sakai, Goldberg, Kurtz, Lefevre, Miller, Peterson, Pressman, Quinn and Sutley.
Noes:	None
Abstentions:	None
Absent:	Director Petersen.

The motion for items 3a and 7-4 passed by a vote of 17 ayes, 0 no, 0 abstentions, and 1 absent

****END OF CONSENT CALENDAR ITEMS****

5. OTHER BOARD ITEMS - ACTION

None

6. BOARD INFORMATION ITEMS

None

7. COMMITTEE ITEMS

a. Subject: Introduction of New Delta Stewardship Council Member: Maria Mehranian

Presented by: Maria Mehranian, Delta Stewardship Council Member

Chair Quinn provided background information and introductory comments on Ms. Mehranian.

Ms. Mehranian discussed Delta Stewardship Council activities.

b. Subject: State Water Contractors: Purpose and Benefits (Jennifer Pierre, General Manager)
Presented by: Jennifer Pierre, General Manager, State Water Contractors

Ms. Pierre gave a talk that explained the State Water Contractors' (SWC) role, accomplishments, and current projects. She also provided details about the SWC's fiscal year 2023/24objectives.

The following Directors provided comments or asked questions:

1. Fellow
2. Smith
3. Ortega

c. Subject: Update on Conservation

Presented by: Karina Sandique, Associate Resource Specialist, Water Resource Management

Ms. Sandique provided an update on Conservation Program expenditures and activity. She also reported that Metropolitan received the 2023 Water Utility Member of the Year Award from the Alliance for Water Efficiency.

8. MANAGEMENT REPORTS

a. Subject: Colorado River Manager's Report

Presented by: Bill Hasencamp, Manager, Colorado River Resources

Mr. Hasencamp's report included an update on Lake Mead; Colorado River shortages and activity as related to Bard Water District, Quechan Pilot Programs, and Palo Verde Irrigation District maximum fallowing call.

d. Subject: Chief Sustainability Resiliency and Innovation Officer's Report

Presented by: Liz Crosson, Chief, Sustainability Resiliency & Innovation Officer

Mr. Crosson's report included an explanation of the Group's mission statement, key initiatives, and its role at Metropolitan.

b. Subject: Bay-Delta Manager's Report

Presented by: Nina Hawk, Manager, Bay-Delta Initiatives

Ms. Hawk reported on Sites Reservoir and a Bay Delta tour.

c. Subject: Water Resource Management Manager's Report

Presented by: Brad Coffey, Manager, Water Resource Management

Ms. Coffey reported on current water supplies and Bucket 2 proposal.

1. Smith

9. FOLLOW-UP ITEMS

Director Peterson requested an update on potential water storage in the Freeman Diversion Area with United Water District and an update on unbalanced exchanges.

10. FUTURE AGENDA ITEMS

None

11. ADJOURNMENT

The next meeting will be held on September 11, 2023

The meeting adjourned at 4:21 p.m.

Tracy Quinn
Chair

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

BOARD ACTION

- **Board of Directors**
  One Water and Stewardship Committee

9/12/2023 Board Meeting

7-4

Subject

Review and consider Eastern Municipal Water District's certified Final Environmental Impact Report and Addendum, and take related CEQA actions; Authorize the General Manager to enter into a Local Resources Program Agreement with Eastern Municipal Water District for the French Valley Recycled Water Distribution Project for up to 140 acre-feet per year of recycled water for irrigation use in the Eastern Municipal Water District service area

Executive Summary

This letter requests authorization for Metropolitan to enter into a Local Resources Program (LRP) Agreement with Eastern Municipal Water District (Eastern) for the French Valley Recycled Water Distribution Project (Project). The Project would provide up to 140 acre-feet per year (AFY) of recycled water for irrigation use in the French Valley area. The Project helps Metropolitan increase regional water supply reliability, reduce future demands for imported water supplies, and achieve its Integrated Resources Plan (IRP) goals. In addition, the Project helps Metropolitan comply with a legislative direction under Senate Bill 60 (SB 60) to expand water conservation, recycling, and groundwater storage and replenishment.

Details

Background

Metropolitan created the LRP to provide financial incentives to local projects, such as water recycling, groundwater recovery, and seawater desalination, developed by local and member agencies. Since the inception of the LRP in 1982, Metropolitan has provided financial assistance for the production of over 4.2 million acre-feet of recycled water and recovered groundwater. These programs help Metropolitan meet its legislative mandates under SB 60 to expand water conservation, recycling, and groundwater storage and replenishment measures. Benefits include helping increase water supply reliability, reducing imported water demands, decreasing the burden on Metropolitan's infrastructure, reducing system costs, and freeing up conveyance capacity. In fiscal year 2021/22, Metropolitan incentivized member agencies to produce about 115,000 acre-feet (AF) of local supply. In October 2018, the Board approved an interim LRP target to develop additional contractual yield.

In February 2023, Metropolitan initiated a new planning process to address enterprise-wide climate adaptation. This Climate Adaptation Master Plan for Water (CAMP4W) will include rigorous technical analysis as developed in the IRP, but also more explicitly address reliability, resilience, affordability, and fiscal sustainability in the face of potentially severe climate impacts in the coming decades. This process may result in modifications to the LRP, but until then, Metropolitan will continue to accept and evaluate LRP applications.

Proposed Project

To increase local supply development, staff recommends that the Board authorize the General Manager to enter into an LRP agreement with Eastern to provide financial incentives for the Project. The Project will deliver recycled water for irrigation use. The Project consists of the construction of 2,500 linear feet (LF) of 12-inch recycled water pipeline along Benton Road, 7,500 LF of 12-inch recycled water pipeline along Pourroy Road East, and 2,300 LF of 8-inch recycled water pipelines along Skyview Road. In total, 12,300 LF of pipeline will be constructed within the French Valley area and will distribute tertiary treated recycled water from the existing

Temecula Valley Regional Water Reclamation Plant. Eastern will own and operate the Project and plans to deliver water by 2024.

The Project, described in **Attachment 1**, complies with the LRP criteria adopted by the Board on October 13, 2014. Key terms of the proposed agreement, subject to approval in form by the General Counsel, include the following:

1. The agreement term is 25 years for a contract yield of 140 AFY.
2. Pay for performance – LRP financial incentives are only for recycled water delivered by the Project for beneficial use.
3. Fixed incentive of up to $305/AF over 25 years.
4. Termination for nonperformance if construction does not commence within two years of agreement execution or if recycled water deliveries are not realized within four years of agreement execution.
5. Reduction in Metropolitan's contract commitment if the Project falls short of production targets measured in four-year intervals throughout the agreement term.

Policy

By Minute Item 49923, dated October 14, 2014, the Board approved refinements to the Local Resources Program to encourage additional local resource production.

By Minute Item 51356, dated October 9, 2018, the Board approved an interim Local Resources Program target yield of 170,000 AFY of new water production.

California Environmental Quality Act (CEQA)

CEQA determination for Option #1:

Pursuant to the provisions of CEQA and the State CEQA Guidelines, Eastern, acting as Lead Agency, prepared and processed the French Valley Recycled Water Distribution Final Environmental Impact Report (Final EIR) for the proposed Project. The Final EIR was certified, and the Project was approved by the Lead Agency on September 16, 2010. The Lead Agency also approved the Findings of Fact, the Statement of Overriding Considerations (SOC), and the Mitigation Monitoring and Reporting Program (MMRP). Subsequent to that time, Eastern proposed to commence negotiations with Metropolitan as related to the LRP agreement. This new information constituted a minor modification to the originally approved Project. As the Lead Agency, Eastern prepared an Addendum to the Final EIR, certified it, and approved the proposed Project modification on July 19, 2023.

Metropolitan, as a Responsible Agency under CEQA, is required to certify that it has reviewed and considered the information in the certified Final EIR and Addendum, and adopt the Lead Agency's findings, SOC, and MMRP, prior to the approval of the formal terms and conditions for the proposed agreement. The environmental documentation is included in **Attachment 2** and **Attachment 3**.

CEQA determination for Option #2:

None required

Board Options

Option #1

Review and consider Eastern Municipal Water District's certified Final Environmental Impact Report and Addendum, and take related CEQA actions, and authorize the General Manager to enter into a Local Resources Program Agreement with Eastern Municipal Water District for the French Valley Recycled Water Distribution Project for up to 140 AFY of recycled water for irrigation use in the Eastern Municipal Water District service area.

Fiscal Impact: Metropolitan's maximum financial obligation would be up to $1,067,500 for a project yield of 140 AFY over 25 years. Staff factors these incentive payments into Metropolitan's rate projections and includes them in future budgets.
Business Analysis: The Project would help Metropolitan to achieve its current IRP goals and meet its legislative mandates, while reducing the district's system costs.

Option #2

Do not authorize the execution of an agreement for the Project.
Fiscal Impact: None
Business Analysis: Metropolitan would pursue other projects, and it may take longer to meet current IRP goals.

Staff Recommendation

Option #1

Brad Coffey 8/29/2023

Brad Coffey *Date*
Manager, Water Resource Management

8/29/2023

Adel Hagekhalil *Date*
General Manager

Attachment 1 – Exhibit A – French Valley Recycled Water Distribution Project – Project Description

Attachment 2 – Notice of Determination

Attachment 3 – Addendum To EA/EIR for the French Valley Recycled Water Distribution – Pipeline Expansion Project

Ref# wrm12695010

EXHIBIT A

FRENCH VALLEY RECYCLED WATER DISTRIBUTION PROJECT

Project Description

Overview

The French Valley Recycled Water Distribution Project (Project) will be owned and operated by Eastern Municipal Water District (Eastern) to convey about 140 acre-feet per year of recycled water for irrigation to common area landscape in the French Valley Area in Riverside County. The Project will use recycled water produced at the Temecula Valley Regional Water Reclamation Plant.

Project Facilities

The Project (as shown in Figure 1) consists of the installation of 12,300 lineal feet (LF) of pipeline in the French Valley areas. The 12,300 LF consist of 2,500 lineal feet (LF) of 12-inch recycled water pipeline along Benton Road, 7,500 LF of 12-inch recycled water pipeline along Pourroy Road East, and 2,300 LF of 8-inch recycled water pipelines along Skyview Road.

Source of Water

Source water for the Project will be tertiary treated recycled water supplied by the Temecula Valley Regional Water Reclamation Plant located in the central commercial area of the city of Temecula.

End Users

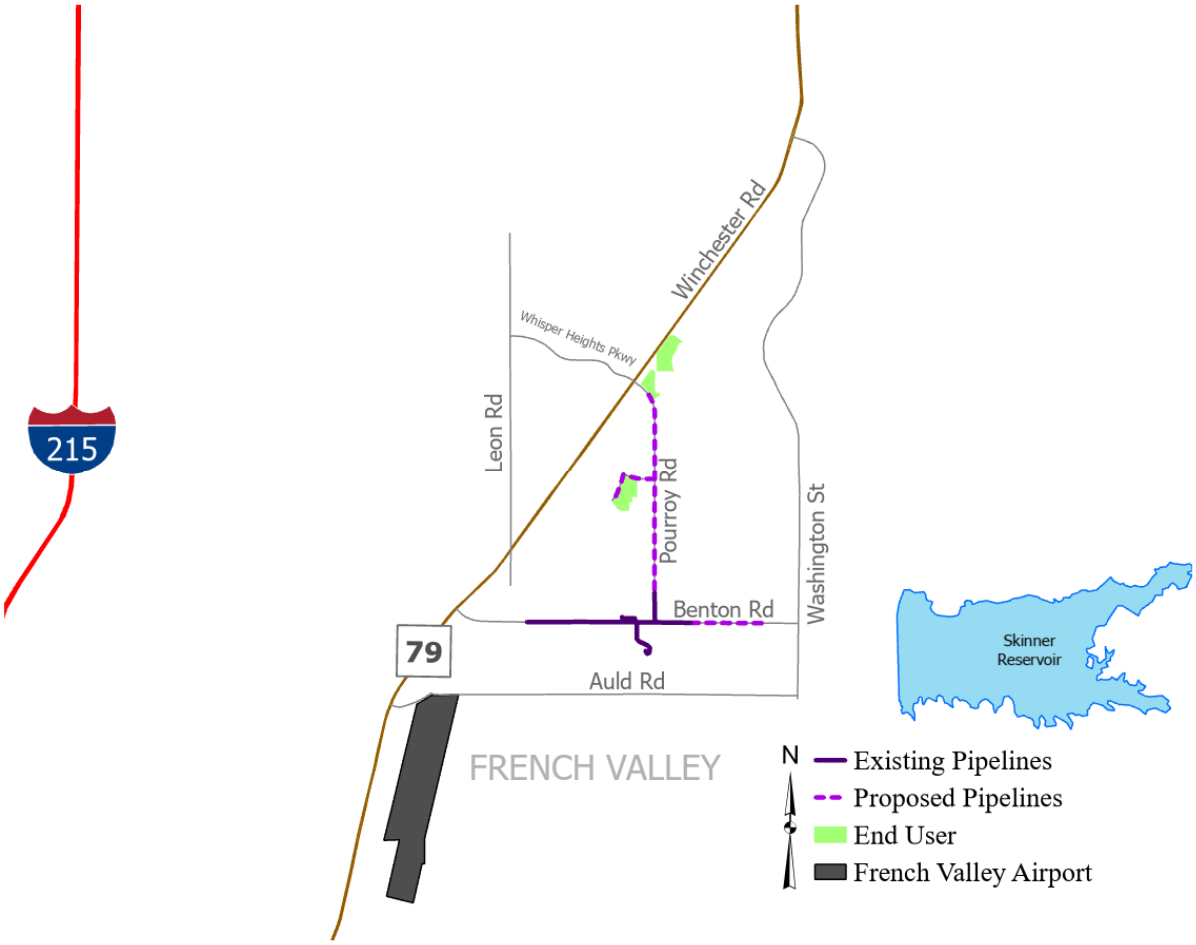
Currently, there is existing recycled water used primarily for landscape and construction purposes within the Project area. Existing customers include: Valley-Wide Recreation and Park District, Temecula Valley Unified School District, and the Homeowner's Association Elite Management. Eastern is further working on retrofitting landscape for various existing potable sites that would be served by this Project. The Project will deliver 140 AFY of recycled water for irrigation use in parks operated and maintained by the Valley-Wide Recreation and Park District, local schools, and other common area landscape.

Points of Connection

Project facilities begin near the intersection of Pourroy Road East and Winchester Road and continue south on Pourroy Road East until connecting to existing recycled water pipelines. Facilities will end at the following points of connection:

- Each Project End-User
- Existing recycled water systems

Figure 1



FRENCH VALLEY RECYCLED WATER DISTRIBUTION PROJECT

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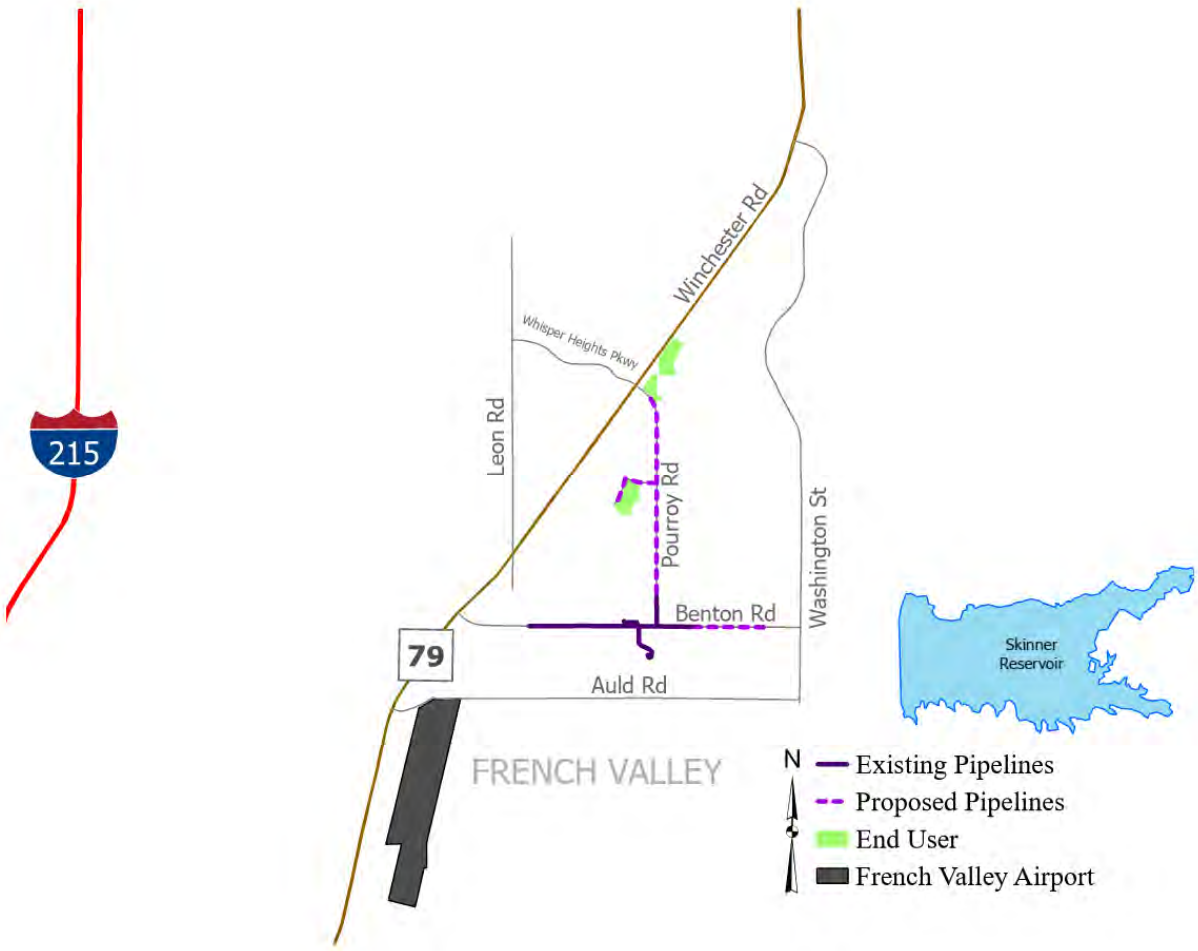
Points of Connection

Project facilities begin near the intersection of Pourroy Road East and Winchester Road and continue south on Pourroy Road East until connecting to existing recycled water pipelines. Facilities will end at the following points of connection:

- Each Project End-User
- Existing recycled water systems

Figure 1



FRENCH VALLEY RECYCLED WATER DISTRIBUTION PROJECT

CEQA-7

NOTICE OF DETERMINATION

To: ■ Office of Planning and Research
1400 Tenth Street
P. O. Box 3044
Sacramento, CA 95812-3044

■ County Clerk
County of Riverside
2724 Gateway Drive
P. O. Box 751
Riverside, CA 92502-0751

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

RIVERSIDE COUNTY
SEP 16 2010
LARRY W. WARD, CLERK
By M. Meyer
Deputy

Subject: Filing of the Notice of Determination in Compliance with Section 21108 or 21152 of the Public Resources Code

COUNTY CLERK
Neg Declaration/Ntc Determination
Filed per P.R.C. 21152
POSTED
SEP 16 2010
Removed: 10.18.10
By: _____ Dept.
County of Riverside, State of California

Project Title: Recycled Water Distribution Pipeline Expansion Project
Environmental Assessment/Environmental Impact Report

State Clearinghouse Number: State Clearinghouse No. 2010031001

Contact Person: Karen Hackett

Phone Number/Ext.: (951) 928-3777, Extension 4462

Project Location: The proposed project will be located within the cities of Hemet (Diamond Valley), San Jacinto, Perris, Menifee, Moreno Valley, and within the French Valley unincorporated area of Riverside County (see attached map).

Project Description: In 2003, Eastern Municipal Water District (EMWD) adopted its *Mandatory Use Policy for Recycled Water* and began working with developers to design and construct facilities and irrigation systems for recycled water use. In many cases, these facilities are presently being supplied with potable water in anticipation of future recycled water availability. These developer projects are considered "conversions" and are located throughout EMWD's service area. These conversion projects have been strategically located in geographic vicinities which are both close to existing large potable water landscape users (retrofits) and planned future development.

Eastern Municipal Water District Plans to construct approximately 89,405 lineal feet (LF) of recycled water pipeline varying in size from 8-inch diameter up to 24-inch diameter within various public street rights-of-way in five geographic locations as follows. Approximately 13,050 LF will be constructed in Diamond Valley; approximately 31,152 LF will be constructed in Menifee; approximately 14,075 LF will be constructed in French Valley; approximately 16,778 LF will be constructed on Moreno Valley/Perris North; and approximately 14,350 LF will be constructed in San Jacinto

Upon completion, this secondary distribution pipeline will provide an immediate reduction of approximately 2,000 acre-feet annually (afa) of potable water demand while helping to support an additional 5,300 afa of new development landscape demand

This is to advise that the Eastern Municipal Water District has approved the described project on September 15, 2010 and has made the following determinations regarding the above described project:

1. The project {■ will, ☐ will not} have a significant effect on the environment.

2. ■ An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA.

3. ☐ A Negative Declaration was prepared for this project pursuant to the provisions of CEQA.

4. Mitigation measures {■ were, ☐ were not} made a condition of the approval of the project.

5. A statement of Overriding Considerations {■ was, ☐ was not} adopted for this project.

6. Findings {■ were, ☐were not} made pursuant to the provisions of CEQA.

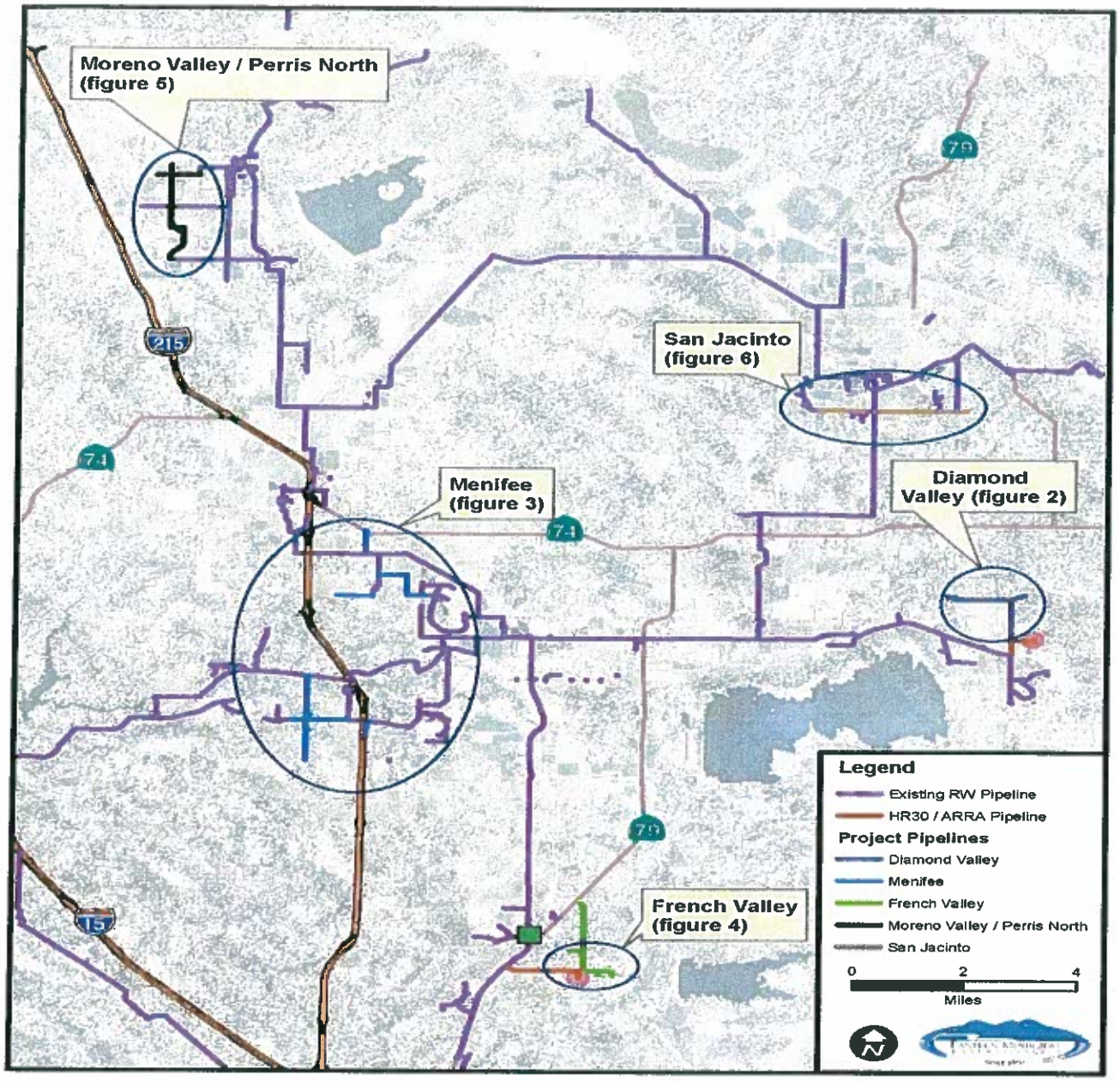
This is to certify that the Final Environmental Impact Report with comments and responses, Findings of Fact and Statement of Overriding Consideration, and the record of project approval is available to the General Public at:

Eastern Municipal Water District
2270 Trumble Road
Perris, CA 92570

Date: 9/16/2010

Joseph B. Lewis
Joseph B. Lewis
Director of Engineering Services

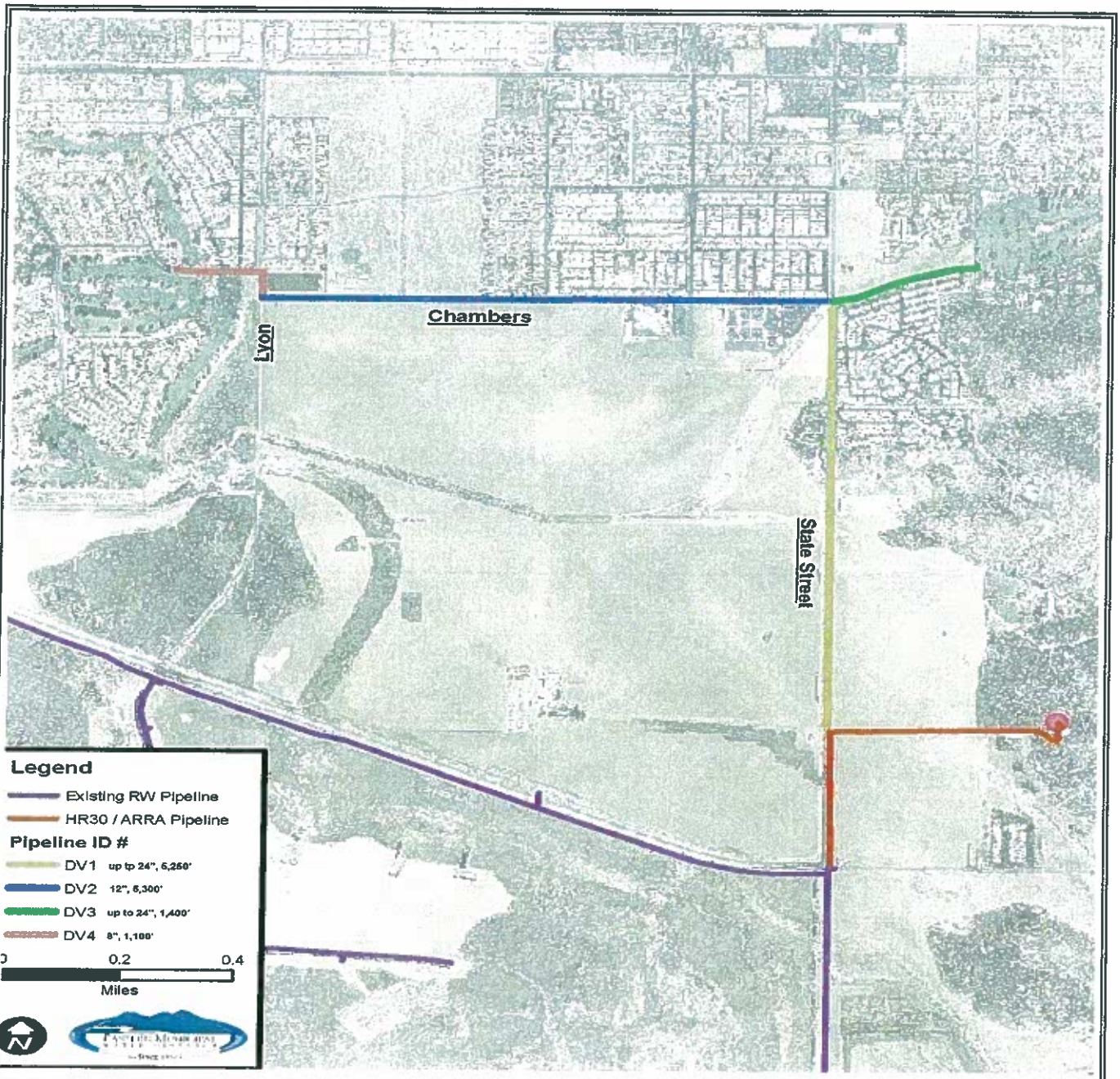
Date received for filing at OPR:



K.S. Dunbar & Associates, Inc.
Environmental Engineering
3035 Calle Frontera
San Clemente, CA 92673-3012
(949) 366-2089
FAX (949) 366-5315
E-Mail: ksdpe@cox.net

Figure 1
Recycled Water Distribution Pipelines

Executive Summary
Environmental Assessment/Draft Environmental Impact Report
Recycled Water Distribution Pipeline Expansion Project
U.S. Bureau of Reclamation/Eastern Municipal Water District



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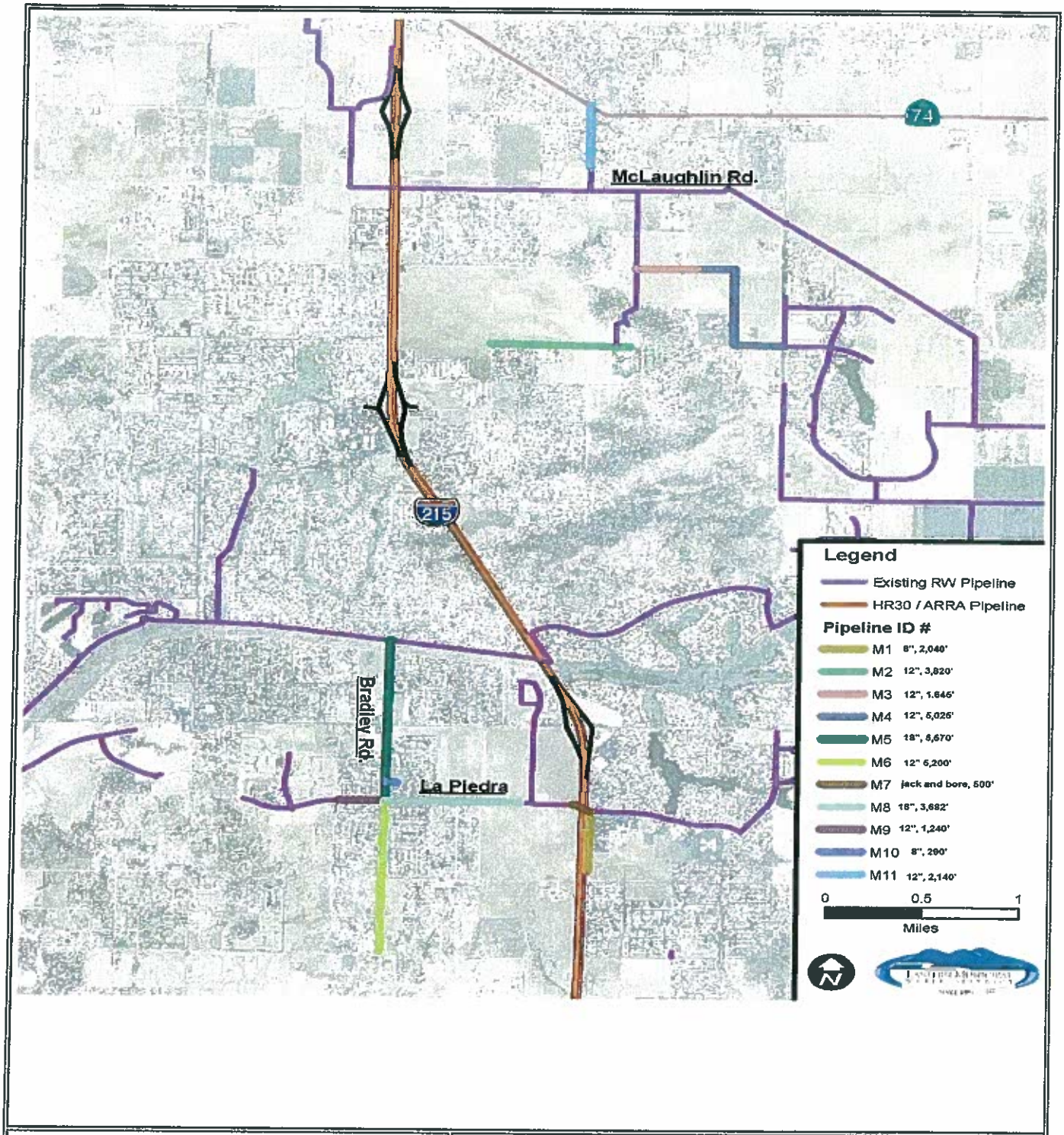
(949) 366-2089
FAX (949) 366-5315
E-Mail: ksdpe@cox.net

Figure 2
Diamond Valley Recycled Water Distribution Pipelines

Executive Summary
Environmental Assessment/Draft Environmental Impact Report
Recycled Water Distribution Pipeline Expansion Project
U.S. Bureau of Reclamation/Eastern Municipal Water District



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FAX (949) 366-5315
E-Mail: ksdpe@cox.net

Figure 3
Menifee Recycled Water Distribution Pipelines

Executive Summary
Environmental Assessment/Draft Environmental Impact Report
Recycled Water Distribution Pipeline Expansion Project
U.S. Bureau of Reclamation/Eastern Municipal Water District

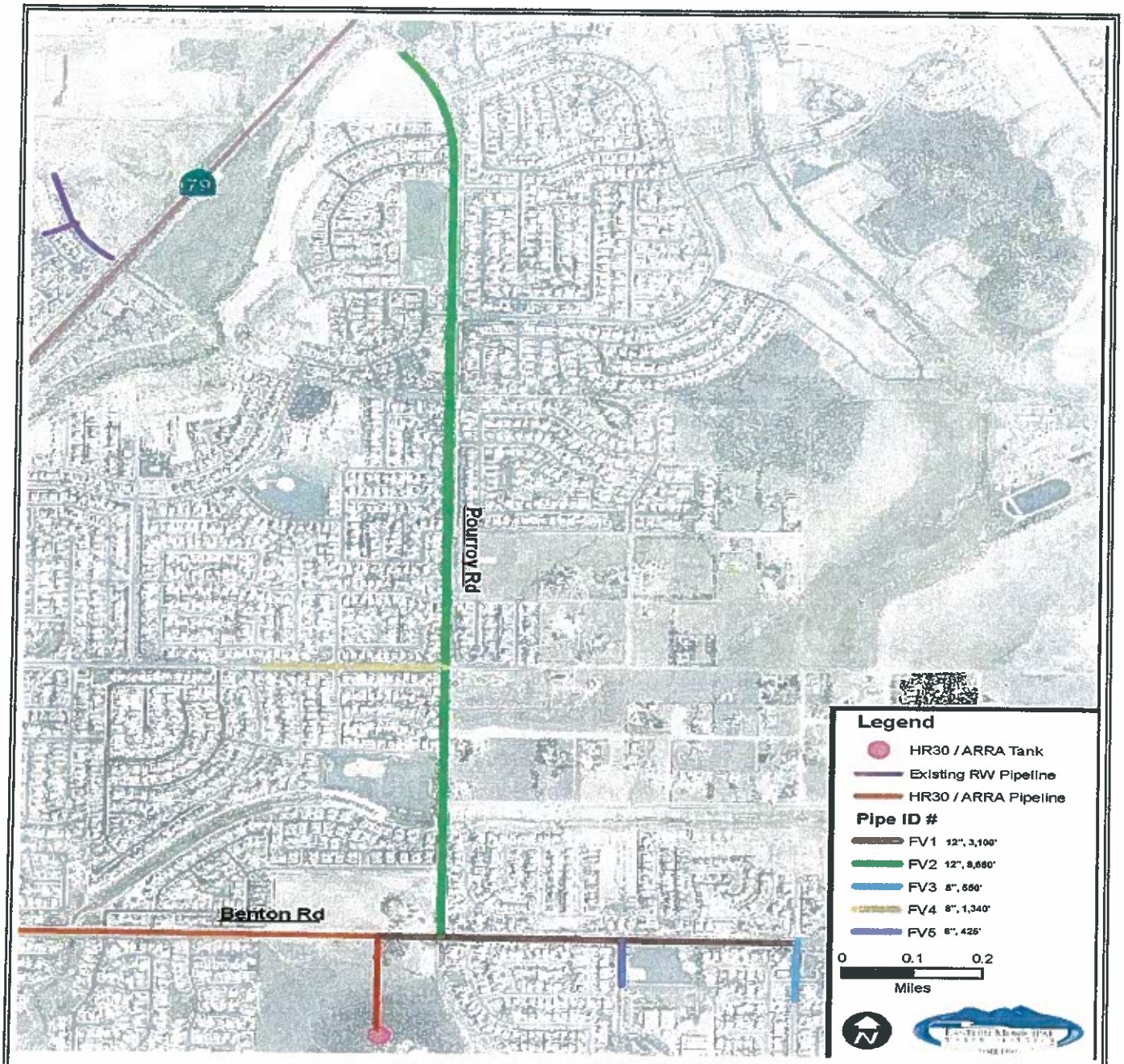

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Figure 4
French Valley Recycled Water Distribution Pipelines

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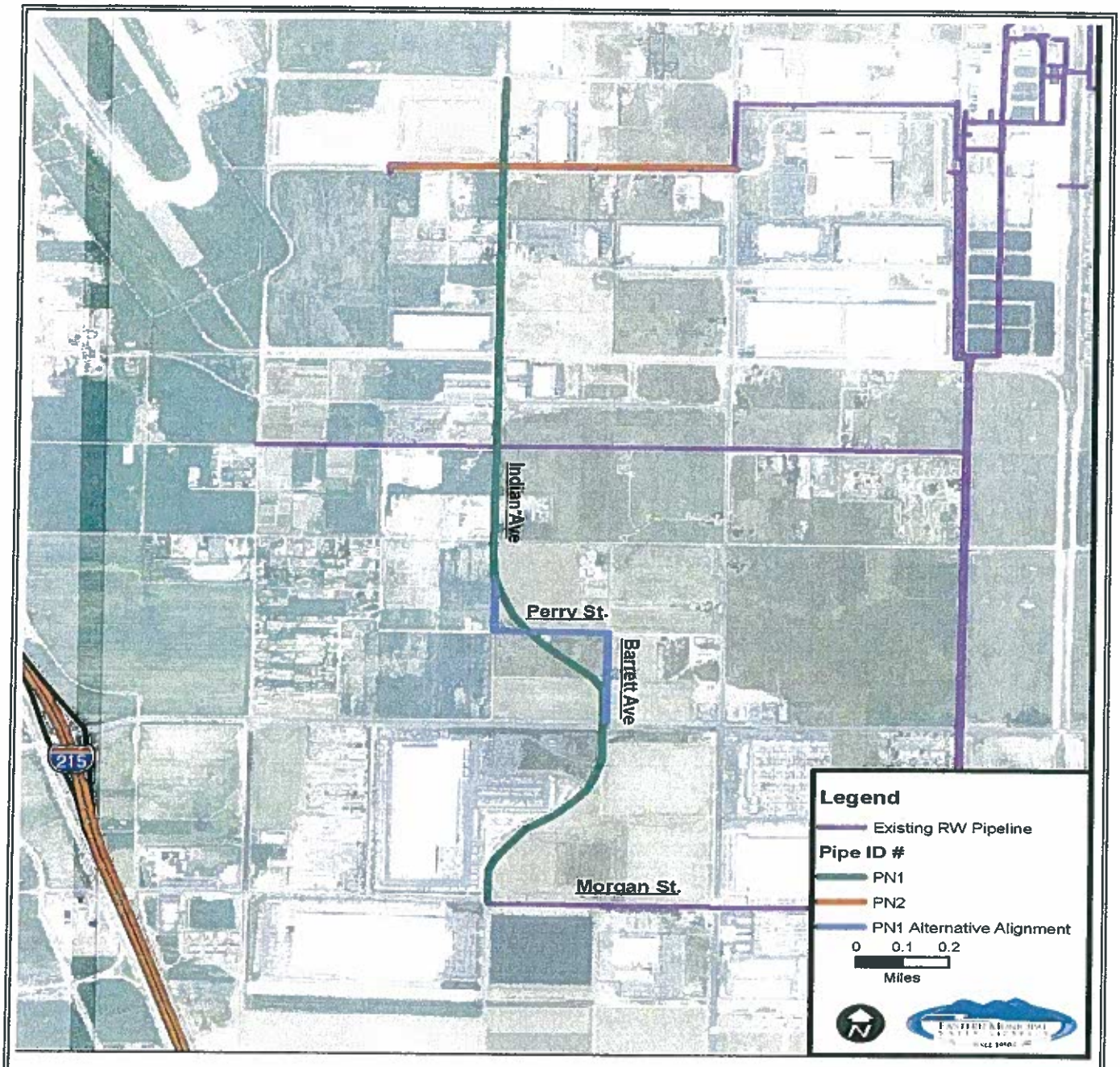

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Figure 5
Moreno Valley/Perris North Recycled Water Distribution Pipelines

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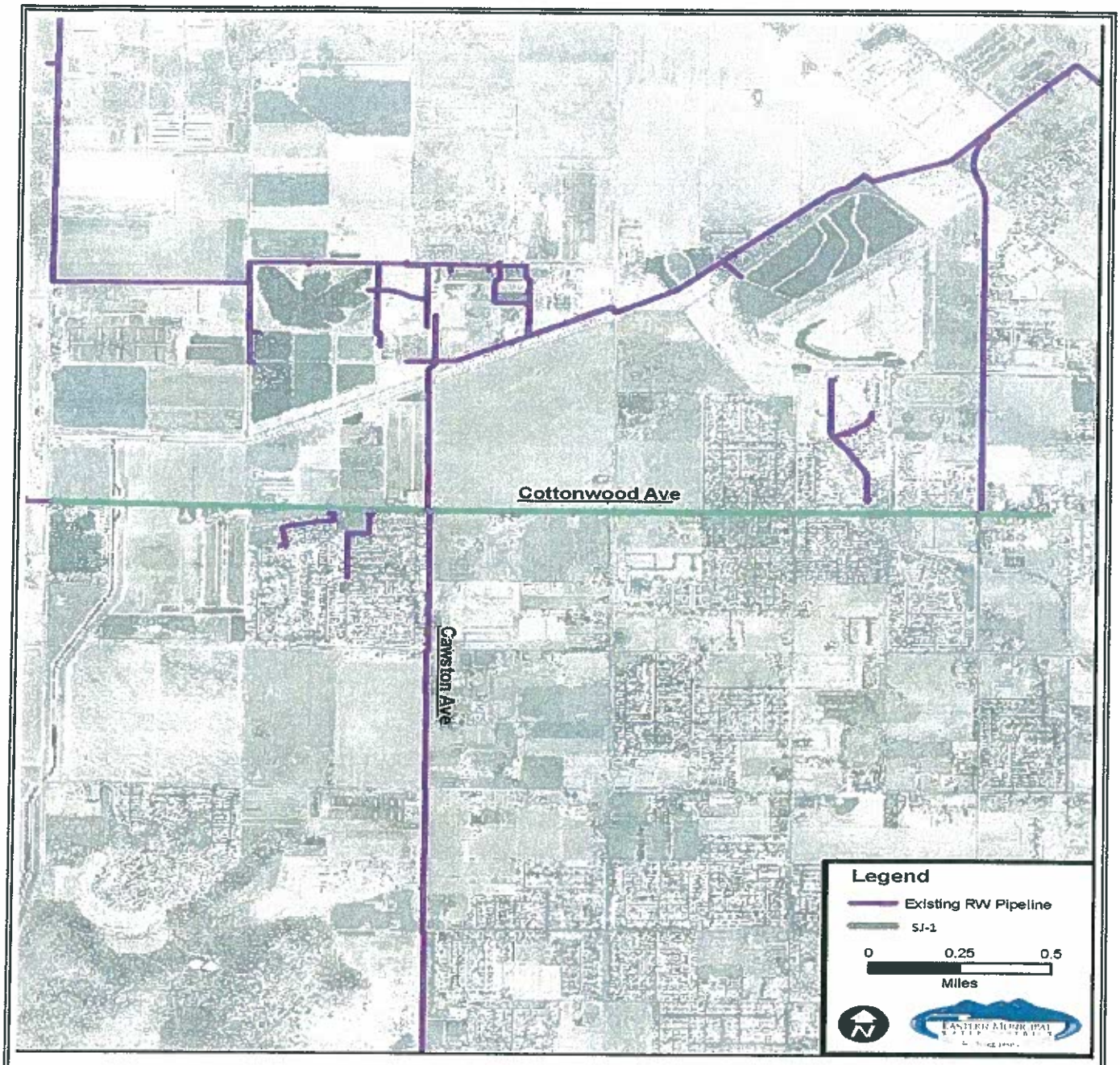

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Figure 6
San Jacinto Recycled Water Distribution Pipelines

Executive Summary
Environmental Assessment/Draft Environmental Impact Report
Recycled Water Distribution Pipeline Expansion Project
U.S. Bureau of Reclamation/Eastern Municipal Water District

STATE OF CALIFORNIA - THE RESOURCES AGENCY
DEPARTMENT OF FISH AND GAME

ENVIRONMENTAL FILING FEE CASH RECEIPT

Receipt #: 201000846

State Clearinghouse # (if applicable): 2010031001

Lead Agency: EASTERN MUNICIPAL WATER DISTRICT *Date:* 09/16/2010

County Agency of Filing: Riverside *Document No:* 201000846

Project Title: RECYCLED WATER DISTRIBUTION PIPELINE EXPANSION PROJECT; EIR

Project Applicant Name: EASTERN MUNICIPAL WATER DISTRICT *Phone Number:*

Project Applicant Address: 2270 TRUMBLE ROAD PERRIS CA 92572-8300

Project Applicant: Local Public Agency

CHECK APPLICABLE FEES:

☒ *Environmental Impact Report*	2792.25
☐ *Negative Declaration*	
☐ *Application Fee Water Diversion (State Water Resources Control Board Only)*	
☐ *Project Subject to Certified Regulatory Programs*	
☒ *County Administration Fee*	$64.00
☐ *Project that is exempt from fees (DFG No Effect Determination (Form Attached))*	
☐ *Project that is exempt from fees (Notice of Exemption)*	
Total Received	2856.25

Signature and title of person receiving payment:

Notes:

Findings of Fact
and
Statement of Overriding Considerations

Recycled Water Distribution Pipeline Expansion Project

(SCH No. 2010031001)

Prepared for:

Eastern Municipal Water District
Post Office Box 8300
Perris, California 92572-8300

Prepared by:

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September 2010

Findings of Fact

Introduction

Section 15091 of the California Environmental Quality Act Guidelines states:

a) *No public agency shall approve or carry out a project for which an EIR has been certified which identifies one or more significant environmental effects of the project unless the public agency makes one or more written findings for each of those significant effects, accompanied by a brief explanation of the rationale for each finding. The possible findings are:*

   1) *Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effects as identified in the final EIR.*

   2) *Such changes or alterations are within the responsibility and jurisdiction of another public agency and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.*

   3) *Specific economic, legal, social, technological or other considerations, including provisions of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.*

b) *The findings required by subdivision (a) shall be supported by substantial evidence in the record.*

c) *The finding of subdivision (a)(2) shall not be made if the agency making the finding has concurrent jurisdiction with another agency to deal with identified feasible mitigation measures or alternatives. The finding in subdivision (a)(3) shall describe the specific reasons for rejecting identified mitigation measures and project alternatives.*

d) *When making the findings required in subdivision (a)(1), the agency shall also adopt a program for reporting on or monitoring the changes which it has either required in the project or made a condition of approval to avoid or substantially lessen significant environmental effects. These measures must be fully enforceable through permit conditions, agreements, or other measures.*

e) *The public agency shall specify the location and custodian of the documents or other material which constitute the record of the proceedings upon which its decision is based.*

f) *A statement made pursuant to Section 15093 does not substitute for the findings required by this section.*

Findings Concerning Significant Unavoidable Adverse Impacts

The Final Environmental Impact Report (FEIR) indicates that implementation of the Recycled Water Distribution Pipeline Expansion Project (Project) would result in significant adverse impacts with respect to air quality. As shown on pages ES-10 and 5-23 of the FEIR, the total estimated emissions from construction of the individual components would be less than significant; however, the emissions would be potentially significant for oxides of nitrogen if three or more of the Subprojects were constructed simultaneously. Therefore, based on SCAQMD's threshold criteria, if three or more of the Subprojects were constructed simultaneously, construction activities would result in potentially significant short-term impacts to air quality with respect to oxides of nitrogen (NO_x).

Based on the Final EIR and the entire record before the Board of Directors of the Eastern Municipal Water District, the Board of Directors finds that there are no feasible mitigation measures that will reduce the impacts discussed above to less than significant levels. Nevertheless, the Board of Directors is adopting the mitigation measures presented in the *Mitigation Monitoring and Reporting Program.* Specific economic, legal, social, technological or other considerations justify approval of the Project notwithstanding these impacts as more fully described in the *Statement of Overriding Considerations*.

Findings Concerning Significant Impacts Reduced to Less Than Significant Levels by Mitigation Measures Incorporated into the Project

The FEIR identifies significant impacts that are reduced to a "less than significant" level by inclusion in the Project approval of the mitigation measures indentified in the FPEIR. It is hereby determined that the following significant environmental impacts of the Project will be avoided or substantially lessened by the inclusion of the identified mitigation measures which are presented in the *Mitigation Monitoring and Reporting Program.*

Cultural Resources

Although no evidence of cultural resources were found at the Project sites, it is always possible that cultural resources could be unearthed during excavation (Pages ES-10 and ES-11 of FEIR).

Hazards and Hazardous Materials

During construction, the contractor would utilize equipment that uses petroleum based fuels and lubricants, which are subject to both leakage from engine blocks and containers or spilling during refueling and lubrication operations (Page ES-11 and ES-12 of FEIR).

Hydrology and Water Quality

During construction, there would be the possibility that sediment-laden storm runoff could enter surface waters (Pages ES-12 and ES-13 of FEIR).

Noise

Construction activities would temporarily increase the ambient noise levels in the Project area (Page ES-14 of FEIR).

Traffic/Transportation

During construction of the proposed pipelines, there could be times that traffic would be disrupted on local streets (Pages ES-14 and ES-15 of FEIR).

Findings

Based on the FEIR and the entire administrative record, the Board of Directors finds that changes or alterations have been incorporated into the Project which will substantially lessen the significant effects identified above, thereby reducing potential effects to less than significant levels. EMWD hereby adopts the mitigation measures included in the *Mitigation Monitoring and Reporting Program.*

Statement of Overriding Considerations

Introduction

The California Environmental Quality Act (CEQA) requires a decision-maker, in this case the Board of Directors of Eastern Municipal Water District, to balance the benefits of a proposed project against its unavoidable environmental risks in determining whether to approve the project. If the Board of Directors allows the occurrence of significant effects through approval of the project, it must state its specific reasons for so doing in writing. Such measures are included in the following *Statement of Overriding Considerations.*

Section 15093 of the CEQA Guidelines established the following requirements for a statement of overriding considerations:

a. *CEQA requires the decision-making agency to balance, as applicable, the economic, legal, social, technological or other benefits of a proposed project against its unavoidable environmental risks when determining whether to approve the project. If the specific economic, legal, social, technological or other benefits of a proposed project outweigh the unavoidable adverse environment effects, the adverse effects may be considered "acceptable".*

b. *When the lead agency approves a project which will result in the occurrence of significant effects, which are identified in the final EIR but are not avoided or substantially lessened, the agency shall state in writing the specific reasons to support its action based on the final EIR and/or other information in the record. The statement of overriding considerations shall be supported by substantial evidence in the record.*

c. *If an agency makes a statement of overriding considerations, the statement should be included in the record of the project approval and should be mentioned in the notice of determination. This statement does not substitute for, and shall be in addition to, findings required pursuant to Section 15091.*

Eastern Municipal Water District (hereinafter referred to as EMWD) adopts and makes the following statement of overriding considerations regarding the remaining unavoidable impacts identified within the FEIR for the Recycled Water Distribution Pipeline Expansion Project. In adopting Resolution No. 4978, the Board of Directors acknowledges that it has weighed the benefits of the Project against the adverse significant impacts that have not been avoided or substantially lessened to "less than significant" levels through mitigation.

The Board of Directors hereby determines that the benefits of the Project outweigh the unmitigated adverse impacts and the Project should be approved. The Board of Directors finds that to the extent that the identified significant adverse impacts have not been avoided or substantially lessened, there are

specific economic, legal, social, technological or other considerations that support approval of the Project.

Significant Unavoidable Impacts

Unavoidable or potentially unavoidable significant environmental effects of the Project identified in the FEIR and Findings of Fact include the following:

Implementation of the Recycled Water Distribution Pipeline Expansion Project (Project) would result in significant adverse impacts with respect to air quality. As shown on pages ES-10 and 5-23 of the FEIR, the total estimated emissions from construction of the individual components would be less than significant; however, the emissions would be potentially significant for oxides of nitrogen if three or more of the Subprojects were constructed simultaneously. Therefore, based on SCAQMD's threshold criteria, if three or more of the Subprojects were constructed simultaneously, construction activities would result in potentially significant short-term impacts to air quality with respect to oxides of nitrogen (NO_x).

Adoption of Overriding Considerations

EMWD specifically adopts this Statement of Overriding Considerations and finds that: a) as part of the approval provisions, the Project has eliminated or substantially lessened all significant effects on the environmental where feasible, and b) the remaining unavoidable impacts of the Project are acceptable in light of the economic, legal, social, technological and other considerations set forth herein, because the benefits of the Project outweigh the significant adverse impacts.

EMWD finds that each of the overriding considerations set forth below constitutes a separate and independent ground for finding that the benefits of the Project outweigh its significant adverse impacts and is an overriding consideration warranting approval of the Project. These matters are supported by substantial evidence in the record.

Benefits

The benefits of the project are:

- Decrease the amount of recycled water that cannot be beneficially used within EMWD's service area.
- Increase the amount of recycled water that can be beneficially used thereby decreasing the amount of potable water that is currently being used for non-potable uses.
- Decrease the amount of imports from the State Water Project and Colorado River Aqueduct.
- Improve the reliability of landscape irrigation water supplies.

Mitigation Monitoring and Reporting Program Checklist Recycled Water Distribution Pipeline Expansion Project

Mitigation Measure	Monitoring Process	Monitoring Timing	Responsible Person(s)	Date Completed
Air Quality				
EMWD will include the following mitigation measures in its standard construction specifications: ❖ Maintain construction equipment engines by keeping them properly tuned and maintained according to manufacturer's specifications. ❖ Use alternative fuels or clean and low-sulfur fuel for equipment. ❖ Do not idle diesel trucks onsite for more than 5 minutes at a time. ❖ Require construction equipment that meet or exceed Tier 3 emission standards and equip construction equipment with CARB verified oxidation catalysts and particulate traps. ❖ Spread soil binders on site, where appropriate, unpaved roads and staging areas. ❖ Water site and equipment every three hours during active construction periods. ❖ Sweep all streets at least once per day using SCAQMD Rule 1186 certified street sweepers or roadway washing trucks if visible soil materials are carried to adjacent streets. ❖ Suspend grading activities during first and second stage smog alerts and during high winds in accordance with SCAQMD Rule 403 requirements. ❖ If necessary, wash off trucks leaving the site. ❖ Cover haul trucks.	Site Inspection.	During Construction.	Field Engineering Inspector	By: _____ Date: _____

Mitigation Measure	Monitoring Process	Monitoring Timing	Responsible Person(s)	Date Completed
Cultural Resources				
Although no evidence of cultural resources was found at the project site, it is always possible that cultural resources could be unearthed during excavation. Therefore, EMWD will include the following mitigation measures in its standard construction specifications:				
❖ If inadvertent discoveries of cultural resources are encountered at any time during construction, construction personnel shall avoid altering these materials and their context until a qualified archeologist has evaluated the situation and contacted the State Office of Historic Preservation and the closest Indian Tribe to the Project. Project personnel shall not collect or retain cultural resources. Prehistoric resources include, but are not limited to: chert or obsidian flakes; projectile points; mortars and pestles; dark, friable soil containing shell and bone; dietary debris; heat-affected rock; or human burials. Historic resources include stone or adobe foundations or walls; structures and remains with square nails; and refuse deposits (glass, metal, wood, ceramics), often found in old wells and privies.	Site Inspection.	During Excavation.	Field Engineering Inspector	By: _____ Date: _____
❖ If paleontological resources (e.g., fossils) are encountered at any time during construction of the project, construction personnel shall avoid altering these materials and their context until a qualified paleontologist has evaluated the situation. Project personnel shall not collect or retain paleontological resources.	Site Inspection.	During Excavation.	Field Engineering Inspector	By: _____ Date: _____
❖ In the event of an accidental discovery or recognition of any human remains, the County Coroner shall be notified and construction activities at the affected work site shall be halted. If the remains are found to be Native American, the Native American Heritage Commission shall be notified within 24 hours. The NAHC must identify a Most Likely Descendant(s) under Public Resources Code §5097.98 within 48 hours of receiving such notification. Guidelines of the Native American Heritage Commission shall be adhered to in the treatment and disposition of the remains in accordance with the provisions of Health and Safety Code §7050.5 and Public Resources Code §5097.98.	Site Inspection.	During Excavation.	Field Engineering Inspector	By: _____ Date: _____
Hazards and Hazardous Materials				
To reduce potentially hazardous conditions and minimize the impacts from the handling of potentially hazardous materials, EMWD will include the				

Mitigation Measure	Monitoring Process	Monitoring Timing	Responsible Person(s)	Date Completed
following in its construction contract documents:				
❖ The contractor(s) shall enforce strict on-site handling rules to keep construction and maintenance materials out of receiving waters and storm drains. In addition, the contractor(s) shall store all reserve fuel supplies only within the confines of a designated construction staging area, refuel equipment only within the designated construction staging area, and regularly inspect all construction equipment for leaks.	Site Inspection.	During Construction.	Field Engineering Inspector.	By: _____ Date: _____
❖ The contractor(s) shall prepare a *Health and Safety Plan* in compliance with the requirements of Chapter 6.95, Division 20 of the Health and Safety Code (§§ 25500—25532). The plan shall include measures to be taken in the event of an accidental spill.	Site Inspection.	During Construction.	Field Engineering Inspector.	By: _____ Date: _____
❖ The construction staging area shall be designed to contain contaminants such as oil, grease, and fuel products so that they do not drain towards receiving waters or storm drain inlets.	Site Inspection.	During Construction.	Field Engineering Inspector.	By: _____ Date: _____
Hydrology and Water Quality				
EMWD will require contractors to implement a program of best management practices (BMP's) and best available technologies to reduce potential impacts to water quality that may result from construction activities. To reduce or eliminate construction-related water quality impacts before the onset of construction activities, EMWD should obtain coverage under the National Pollutant Discharge Elimination System (NPDES) General Construction Permit. Construction activities shall comply with the conditions of this permit that include preparation of a stormwater pollution prevention plan, implementation of BMP's, and monitoring to insure impacts to water quality are minimized. As part of this process, multiple BMP's should be implemented to provide effective erosion and sediment control. These BMP's should be selected to achieve maximum sediment removal and represent the best available technology that is economically achievable. BMP's to be implemented as part of this mitigation measure should include, but not be limited to, the following:				

Mitigation Measure	Monitoring Process	Monitoring Timing	Responsible Person(s)	Date Completed
❖ Temporary erosion control measures such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other groundcover shall be employed for disturbed areas.	Site Inspection.	During Construction.	Field Engineering Staff.	By: _____ Date: _____
❖ Storm drain inlets on the site and in downstream offsite areas shall be protected from sediment with the use of BMP's acceptable to EMWD, local jurisdictions and the California Regional Water Quality Control Board, Santa Ana or San Diego Regions.	Site Inspection.	During Construction.	Field Engineering Staff.	By: _____ Date: _____
❖ Dirt and debris shall be swept from paved streets in the construction zone on a regular basis, particularly before predicted rainfall events.	Site Inspection.	During Construction.	Field Engineering Staff.	By: _____ Date: _____
❖ No disturbed surfaces shall be left without erosion control measures in place between October 15 and April 15. EMWD shall file a Notice of Intent with the Regional Board and require the preparation of a pollution prevention plan prior to commencement of construction. EMWD shall routinely inspect the construction site to verify that the BMP's specified in the pollution prevention plan are properly installed and maintained. EMWD shall immediately notify the contractor if there were a noncompliance issue and require immediate compliance.	Site Inspection.	During Construction.	Field Engineering Staff.	By: _____ Date: _____
❖ Controls on construction site dewatering shall be implemented. If possible, water generated as part of construction dewatering shall be discharged onsite such that there would be no discharge to surface waters. If discharge to surface waters were unavoidable, EMWD shall obtain coverage under the NPDES General Dewatering Permit prior to commencement of construction. The provisions of this permit are sufficiently protective of water quality to ensure that impacts to surface waters would remain below significance thresholds. During dewatering activities, all permit conditions shall be followed. EMWD shall routinely inspect the construction site to verify that the measures specified in the permit are properly implemented. EMWD shall immediately notify the contractor if there were a noncompliance issue and require immediate compliance.	Site Inspection.	During Construction.	Field Engineering Staff.	By: _____ Date: _____
Noise				
EMWD will include the following in its standard construction specifications:				

Mitigation Measure	Monitoring Process	Monitoring Timing	Responsible Person(s)	Date Completed
❖ Construction activities shall be limited to between the hours of 7:00 am and 7:00 pm and as necessary to comply with local ordinances. Any holiday, nighttime or weekend construction activities shall be subject to local permitting requirements.	Site Inspection.	During Construction.	Field Engineering Inspector.	By: _____ Date: _____
❖ All equipment used during construction shall be muffled and maintained in good operating condition. All internal combustion engines shall be fitted with well maintained mufflers in accordance with manufacturers' recommendations.	Site Inspection.	During Construction.	Field Engineering Inspector.	By: _____ Date: _____
❖ The contractor shall contact each school prior to conducting work adjacent to the school grounds.	Project Records.	During Construction.	Project Engineer.	By: _____ Date: _____
Transportation/Traffic				
The following mitigation measures will be complied with to reduce the transportation/traffic impacts to a level of less than significant:				
❖ Traffic control plans shall be prepared by a qualified professional engineer prior to construction.	Plan Review.	Prior to Construction.	Project Engineer.	By: _____ Date: _____
❖ Traffic control plans shall consider the ability of alternative routes to carry additional traffic and identify the least disruptive hours of construction site truck access routes and the type and location of warning signs, lights and other traffic control devices. Consideration shall be given to maintaining access to commercial parking lots, private driveways and sidewalks, bikeways and equestrian traffic to the greatest extent possible.				
❖ Traffic control plans shall comply with Part 6 of the California Manual on Traffic Control Devices as determined by the affected local agencies to minimize any traffic and pedestrian hazards that exist during project construction.				
❖ Encroachment permits for all work within public rights-of-way shall be obtained from each affected agency prior to commencement of any construction. EMWD shall comply with all traffic control requirements of the local agencies.	Permit Review.	Prior to Construction.	Project Engineer.	By: _____ Date: _____

Mitigation Measure	Monitoring Process	Monitoring Timing	Responsible Person(s)	Date Completed
❖ Public streets shall be kept operational during construction, particularly during the morning and evening peak hours of traffic. Lane closures shall be minimized during peak traffic hours.	Field Inspection.	During Construction.	Field Engineering Inspector.	By: _____ Date: _____
❖ Public streets shall be restored to a condition mutually agreed to between EMWD and the appropriate local agencies prior to construction.	Field Inspection.	During Construction.	Field Engineering Inspector.	By: _____ Date: _____
❖ Emergency service providers shall be contacted and consulted to preclude the creation of unnecessary traffic bottlenecks that would seriously impede response times. Additionally, measures to provide an adequate level of access to private properties shall be maintained to allow delivery of emergency services.	Field Inspection.	During Construction.	Field Engineering Inspector.	By: _____ Date: _____

Environmental Assessment/ Draft Environmental Impact Report

Recycled Water Distribution Pipeline Expansion Project

(SCH No. 2010031001)

Prepared for:

Eastern Municipal Water District
Post Office Box 8300
Perris, California 92572-8300

U.S. Bureau of Reclamation
27708 Jefferson Avenue
Temecula, California 92390

Prepared by:

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June 2010

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Executive Summary
Environmental Assessment/
Draft Environmental Impact Report

Recycled Water Distribution Pipeline Expansion Project

(SCH No. 2010031001)

Prepared for:

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June 2010

Executive Summary

Project Background

In 2003, Eastern Municipal Water District (EMWD) adopted its *Mandatory Use Policy for Recycled Water* and began working with developers to design and construct facilities and irrigation systems for recycled water use. In many cases, these facilities are presently being supplied with potable water in anticipation of future recycled water availability. These developer projects are considered "conversions" and are located throughout EMWD's service area. These conversion projects have been strategically located in geographic vicinities which are both close to existing large potable water landscape users (retrofits) and planned future development.

Subsequently in June 2009, EMWD completed its *Recycled Water Strategic Plan.* Two of the stated objectives in this plan are: 1) fully utilize 100% of recycled water within EMWD's service area and 2) maximize potable water offsets. In order to meet these objectives, EMWD's *Recycled Water Strategic Plan* has allocated current and future recycled water supplies to serve conversions, retrofits and future development. Facility improvements (secondary distribution piping) must be completed in order to deliver recycled water to both conversions and retrofits. In 2009, EMWD began a retrofit planning study through a grant from the California State Water Resources Control Board (State Water Board). This study will further evaluate retrofit opportunities throughout EMWD and is anticipated to be completed by the last quarter of 2010. EMWD is also considering applying for funding from the following sources:

- Local Resources Program (LRP) funding through The Metropolitan Water District of Southern California (MWD).
- Water Recycling Funding Program (WRFP) funding through the State Water Resources Control Board.
- Title XVI (Water Recycling and Reuse Program) funding through the U.S. Bureau of Reclamation.

Pursuant to the *Mandatory Use Policy for Recycled Water* and the *Recycled Water Strategic Plan,* EMWD is actively pursuing landscape demand for maximizing the beneficial use of recycled water to offset potable water demand. In conjunction with the HR30/ARRA[1] system stabilization projects, the Recycled Water Distribution Expansion Pipeline Project (Project) is intended to design and construct secondary distribution piping to serve existing landscape demand while supporting future development. The existing demand is both retrofits and conversions and will benefit EMWD by providing an immediate

[1] H.R. 30 means House Resolution No. 30, which amended the Reclamation Wastewater and Groundwater Study and Facility Act to authorize the Secretary of the Interior to participate in the Eastern Municipal Water District Recycled Water Pressurization and Expansion Project. ARRA means the American Recovery and Reinvestment Act.

reduction of approximately 2,000 acre-feet annually (afa) of potable water demand while helping to support an additional 5,300 afa of new development landscape demand.

Project Description

The Recycled Water Distribution Pipeline Expansion Project (Project) is broken up into five "sub-projects" based on geographic location. These are: Diamond Valley, Menifee, French Valley, Moreno Valley/Perris North and San Jacinto. Combined these projects include approximately 89,405 lineal feet (16.9 miles) of pipeline varying in size from 8-inch diameter up to 24-inch diameter. The breakdown by diameter is as follows: 5,745 lineal feet of 8-inch diameter pipeline, 67,258 lineal feet of 12-inch diameter pipeline, 9,752 lineal feet of 18-inch diameter pipeline, and 6,650 lineal feet of up to 24-inch diameter pipeline. A summary of pipeline identification numbers, location, size and length by sub-project are provided in Table 1 and shown on Figures 1 through 6.

Table 1
Recycled Water Distribution Pipeline Summary

Diamond Valley Recycled Water Distribution Pipeline Summary					
Pipeline ID (Fig. 2)	**Street Alignment**	**From Street**	**To Street**	**Size (inches)**	**Length (feet)**
DV-1	State Street North	Simpson	Chambers	up to 24	5,250
DV-2	West Chambers	State Street	Lyon Avenue	12	5,300
DV-3	East Chambers	State Street	Buena Vista Street	Up to 24	1,400
DV-4	Lyon Ave./Pepper Tree Dr	Chambers	800' E on Pepper Tree	8	1,100
				Subtotal	**13,050**
Menifee Recycled Water Distribution Pipeline Summary					
Pipeline ID (Fig. 3)	**Street Alignment**	**From Street**	**To Street**	**Size (inches)**	**Length (feet)**
M-1	Antelope Road	La Piedra	320' N of Holland	8	2,040
M-2	Chambers Avenue	525' east of Aspel	Sherman	12	3,820
M-3	Rouse Road	San Jacinto Rd.	250' E of Palomar	12	1,645
M-4	Rouse, Junipero & McCall	250' east of Palomar	Menifee	12	5,025
M-5	Bradley north of La Piedra	La Piedra	N of Salt Creek Channel	18	5,570
M-6	Bradley south of La Piedra	La Piedra	100' N of Craig Ave	12	5,200
M-7	Jack & Bore I-215	Antelope Road	120' W I-215	--	500
M-8	La Piedra E of Bradley	Bradley Road	250' W of Haun Rd	18	3,682
M-9	La Piedra W of Bradley	Bradley Road	60' W of Pine Creek Dr	12	1,240
M-10	School Park Drive	Bradley Road	110' E of Lamdin Ln	8	290
M-11	Antelope Road	775' N of McLaughlin	N of Highway 74	12	2,140
				Subtotal	**31,152**
French Valley Recycled Water Distribution Pipeline Summary					
Pipeline ID (Fig. 4)	**Street Alignment**	**From Street**	**To Street**	**Size (inches)**	**Length (feet)**
FV-1	Benton Road	475' W of Pourroy Road	Maddalena Road	12	3,100
FV-2	Pourroy Road	Benton Road	375' S of Hiway 79	12	8,660
FV-3	Maddalena Road	Benton Road	200' S of Fleurs Ln	8	550
FV-4	Thompson Road	Pourroy Road	300' E of Joltaire Way	8	1,340
FV-5	Cady Road	Benton Road	75' N of Beaulieu Road	8	425
				Subtotal	**14,075**
Moreno Valley/Perris North Recycled Water Distribution Pipeline Summary					
Pipeline ID (Fig. 5)	**Street Alignment**	**From Street**	**To Street**	**Size (inches)**	**Length (feet)**
PN-1[2]	Indian Avenue	Morgan Street	San Michele Road	12	12,820
PN-2	Nandina Avenue	Perris Boulevard	1,350' W of Indian Ave	12	3,958
				Subtotal	**16,778**
San Jacinto Recycled Water Distribution Pipeline Summary					
Pipeline ID (Fig. 6)	**Street Alignment**	**From Street**	**To Street**	**Size (inches)**	**Length (feet)**
SJ-1	Cottonwood Avenue	Warren Road	275' E of Pine Street	12	14,350
				Totals	**14,350**
				Project Total	**89,405**

Note: General pipeline alignment shall be on the north or east side of the street at 7' from existing or future face of curb.

[2] Due to the fact that the City of Perris has not realigned Indian Avenue from just north of Perry Street to the Ramona Parkway, EMWD is also proposing an alternative alignment for PN-1 as shown on Figure 5. The alternative alignment would increase the total length of pipeline by about 1,050 lineal feet.

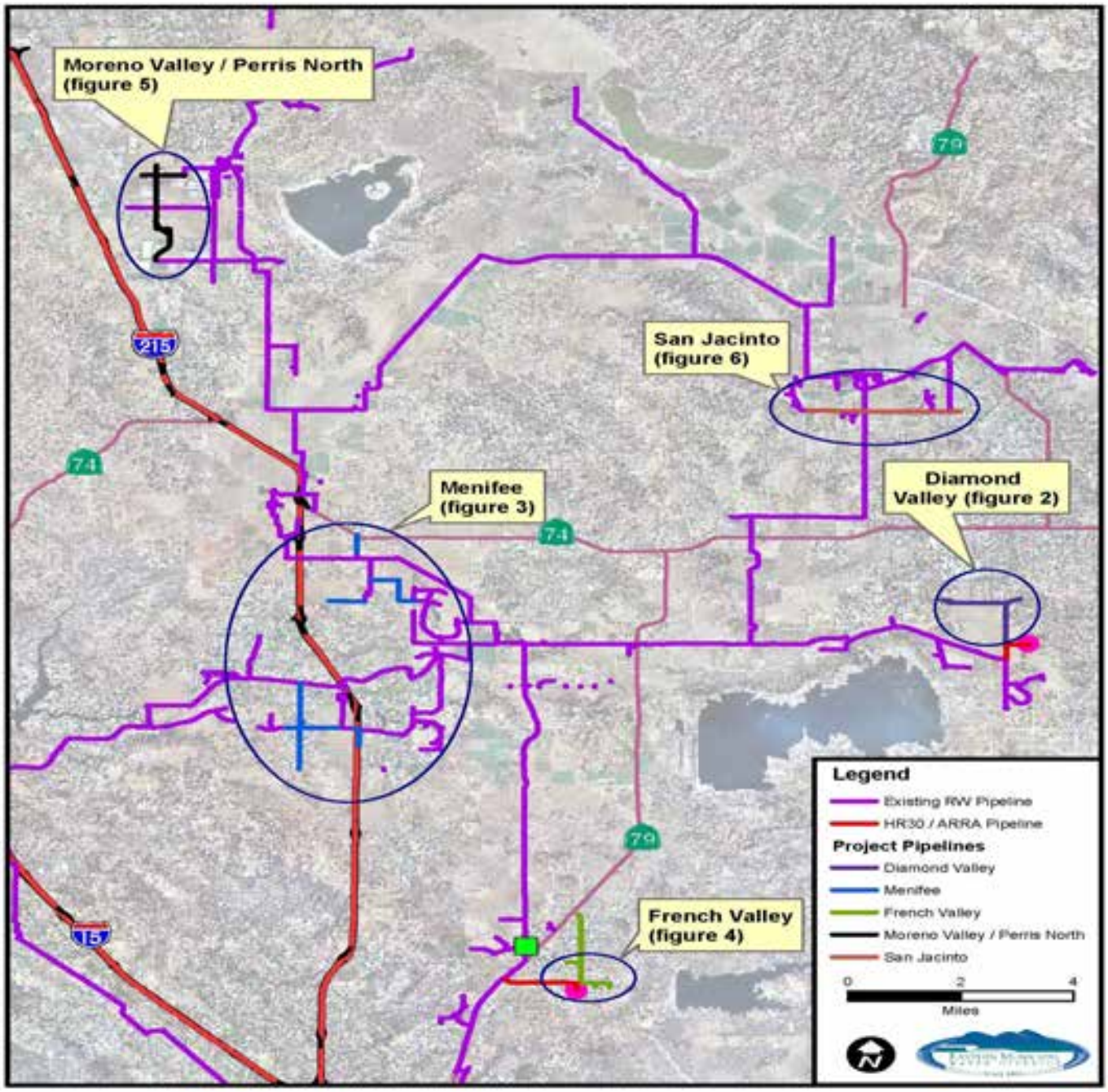

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Figure 1
Recycled Water Distribution Pipelines

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Environmental Assessment/Draft Environmental Impact Report
Recycled Water Distribution Pipeline Expansion Project
U.S. Bureau of Reclamation/Eastern Municipal Water District

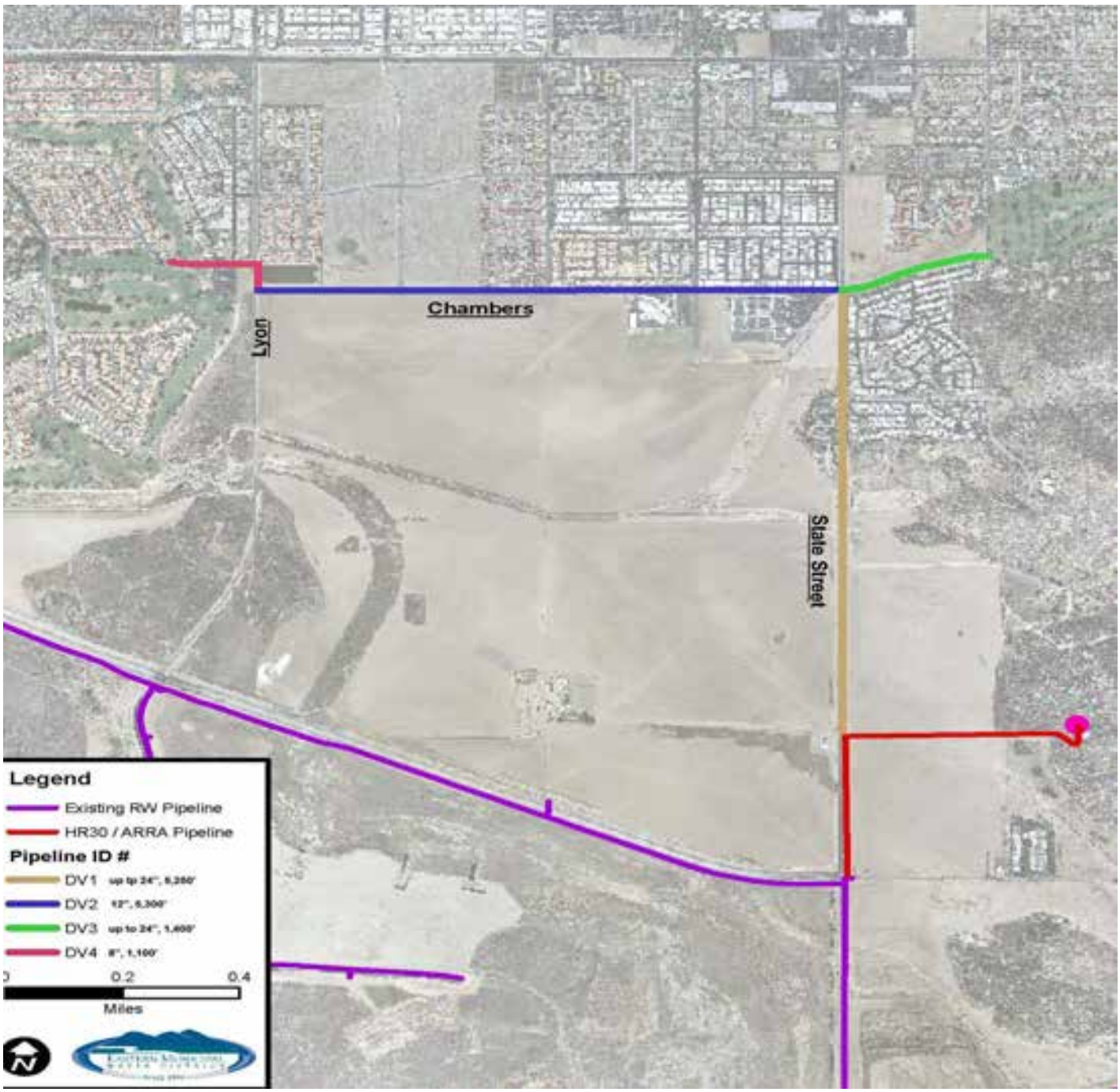

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Figure 2
Diamond Valley Recycled Water Distribution Pipelines

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U.S. Bureau of Reclamation/Eastern Municipal Water District

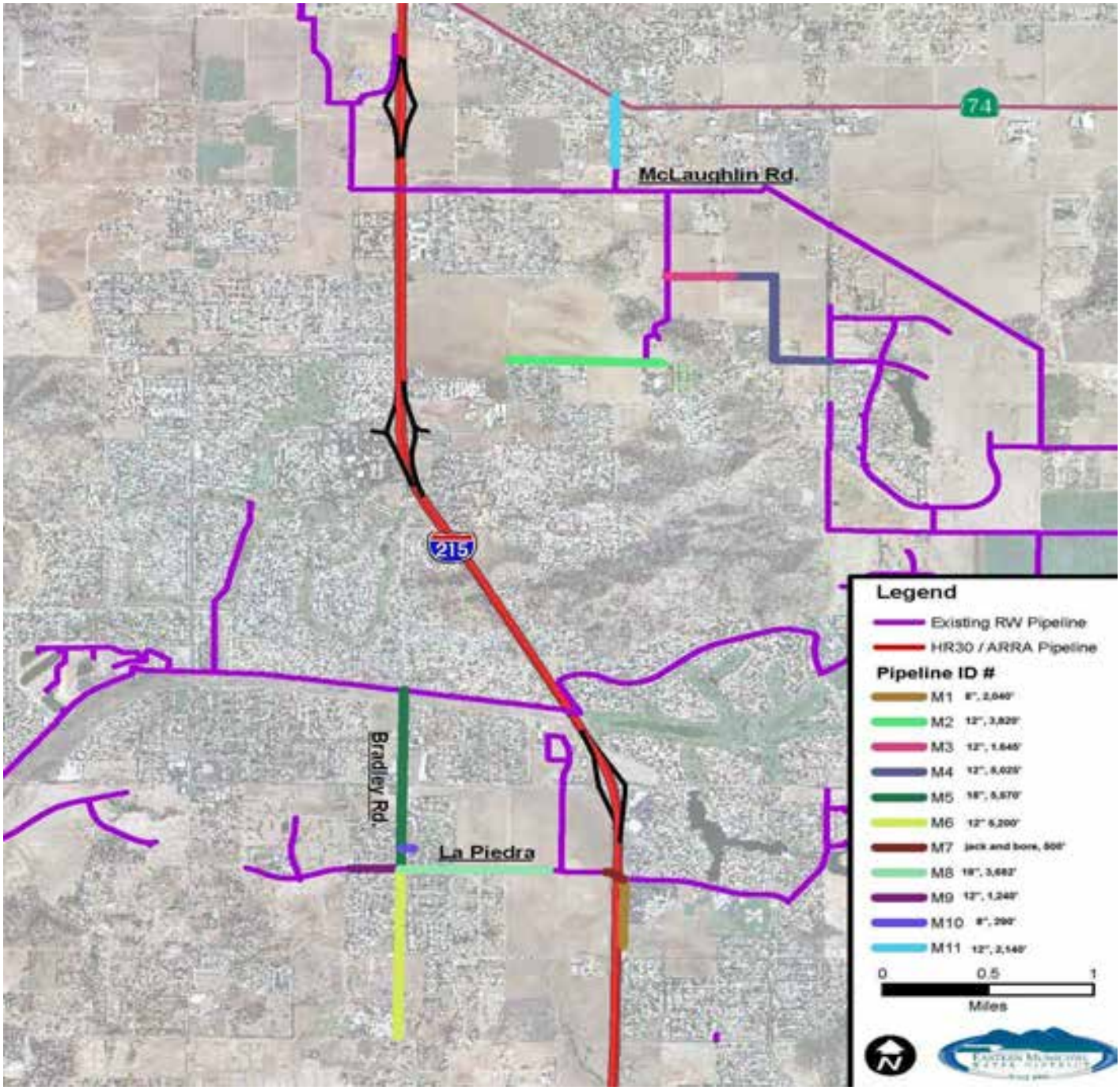

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Figure 3
Menifee Recycled Water Distribution Pipelines

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Recycled Water Distribution Pipeline Expansion Project
U.S. Bureau of Reclamation/Eastern Municipal Water District

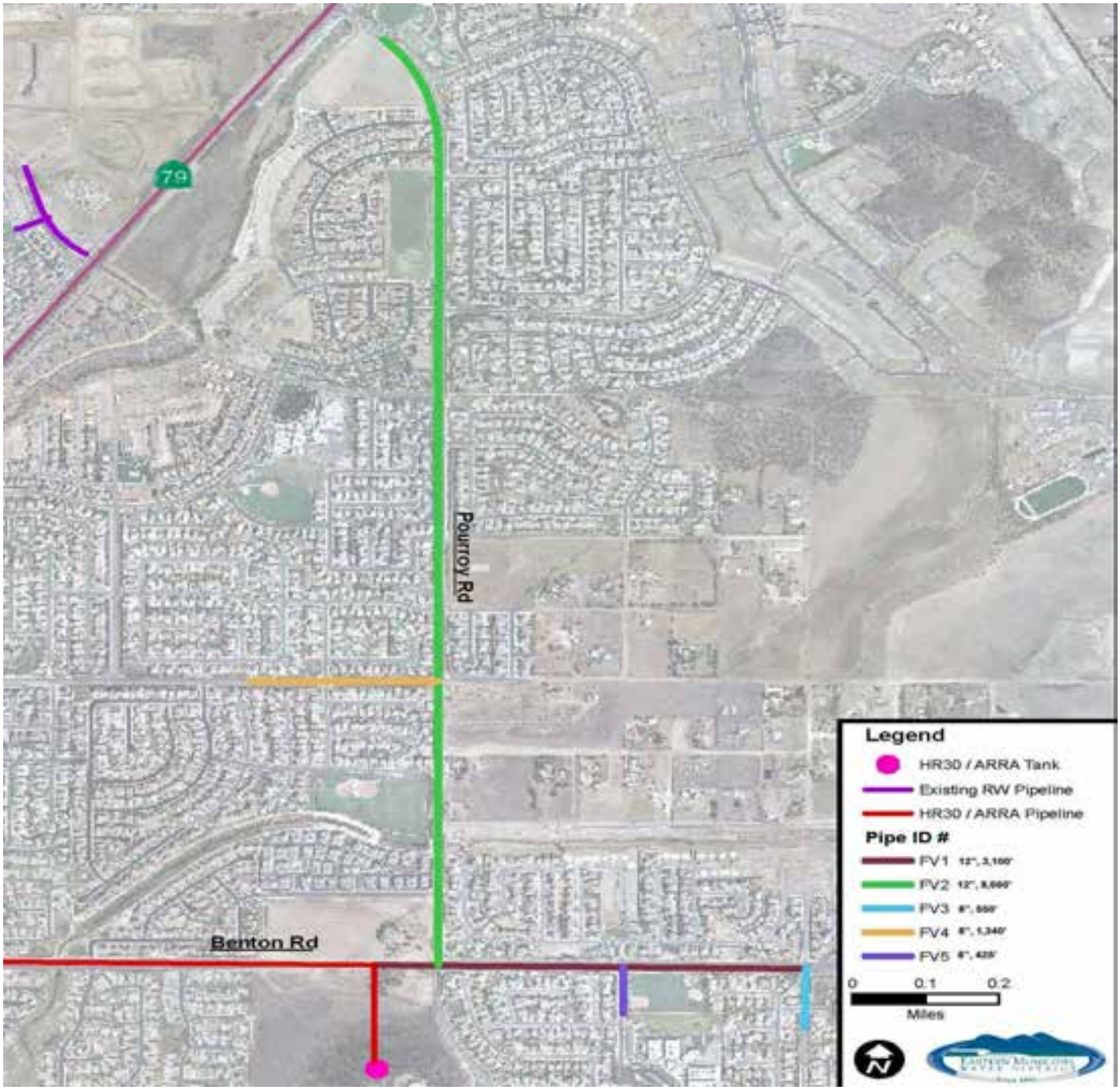

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Figure 4
French Valley Recycled Water Distribution Pipelines

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U.S. Bureau of Reclamation/Eastern Municipal Water District

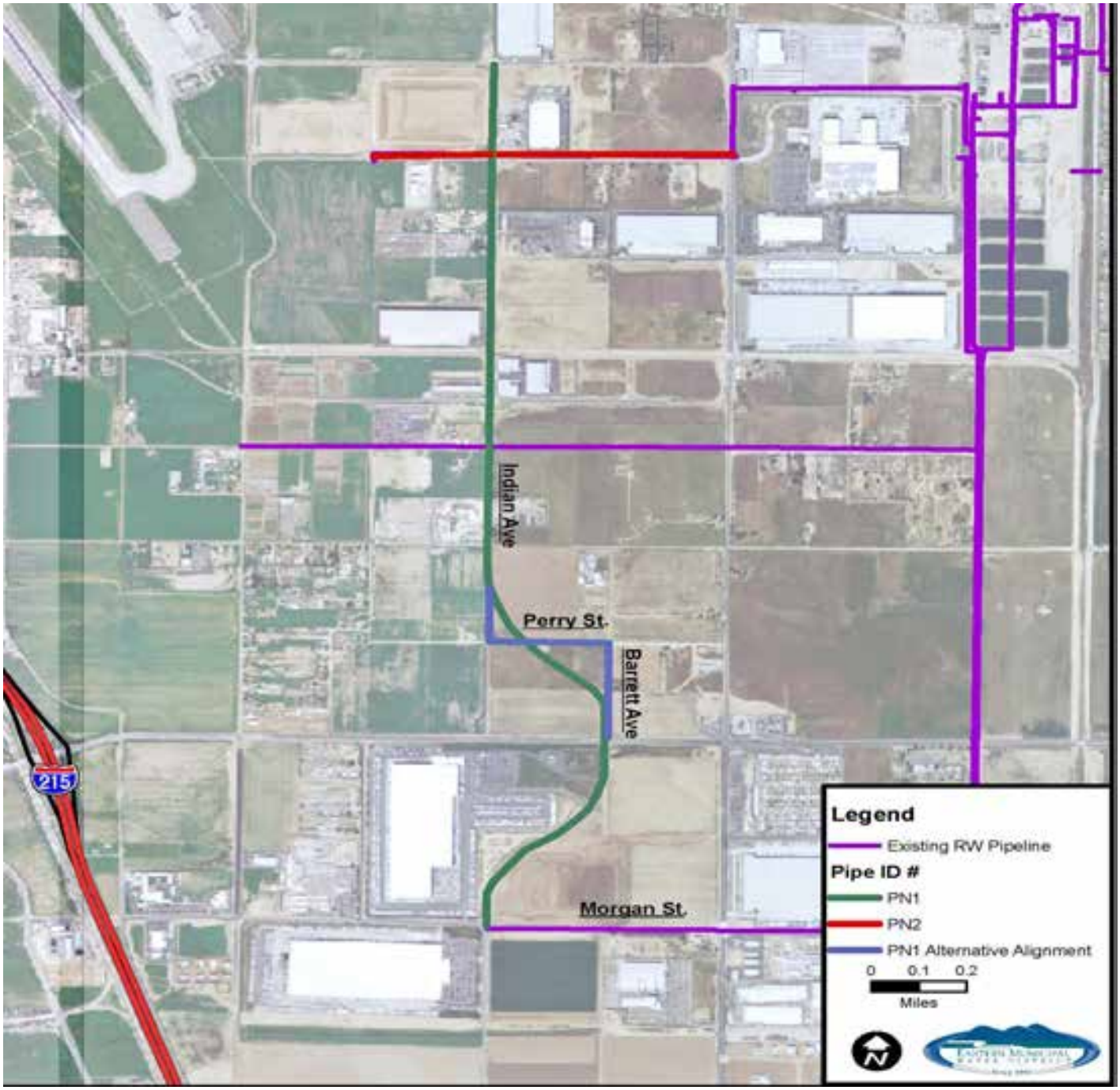

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Figure 5
Moreno Valley/Perris North Recycled Water Distribution Pipelines

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Environmental Assessment/Draft Environmental Impact Report
Recycled Water Distribution Pipeline Expansion Project
U.S. Bureau of Reclamation/Eastern Municipal Water District

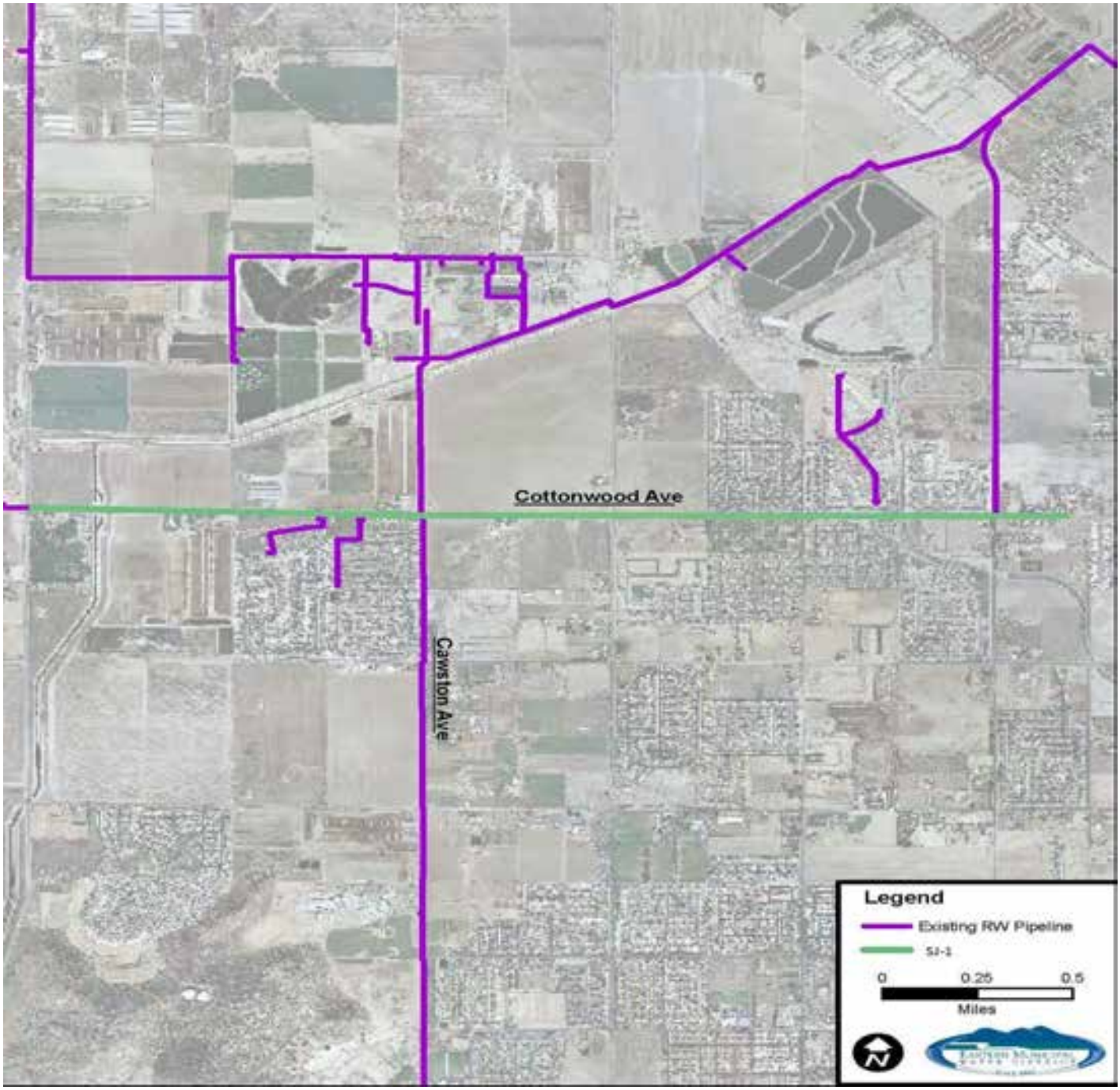

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Figure 6
San Jacinto Recycled Water Distribution Pipelines

Executive Summary
Environmental Assessment/Draft Environmental Impact Report
Recycled Water Distribution Pipeline Expansion Project
U.S. Bureau of Reclamation/Eastern Municipal Water District

Project Objectives

The objectives of the project are:

- Decrease the amount of recycled water that cannot be beneficially used within EMWD's service area.
- Increase the amount of recycled water that can be beneficially used thereby decreasing the amount of potable water that is currently being used for non-potable uses.
- Decrease the amount of imports from the State Water Project and Colorado River Aqueduct.
- Improve the reliability of landscape irrigation water supplies.

Impacts and Mitigation Measures

Section 15123(b)(1) of the *Guidelines for Implementation of the California Environmental Quality Act* requires that each EIR contain a summary that identifies each significant effect with proposed mitigation measures and alternatives that would reduce or avoid that effect. That information is included in Table 2 that follows.

Proposed mitigation measures are EMWD Staff's and its consultant's recommendations to reduce potential impacts associated with implementation of the proposed project. Should EMWD's Board of Directors adopt the Mitigation Monitoring and Reporting Program (Appendix E) including these mitigation measures they would become mandatory and part of the Project.

Table 2
Impacts and Recommended Mitigation Measures

Impact	Recommended Mitigation Measures	Level of Significance After Mitigation
Aesthetics		
None.	None required.	N/A
Agricultural and Forest Resources		
None.	None required.	N/A
Air Quality		
Potential short-term significant impacts associated with oxides of nitrogen during construction.	EMWD should include the following mitigation measures in its standard construction specifications: ❖ Maintain construction equipment engines by keeping them properly tuned and maintained according to manufacturer's specifications. ❖ Use alternative fuels or clean and low-sulfur fuel for equipment. ❖ Do not idle diesel trucks onsite for more than 5 minutes at a time. ❖ Require construction equipment that meet or exceed Tier 3 emission standards and equip construction equipment with CARB verified oxidation catalysts and particulate traps. ❖ Spread soil binders on site, where appropriate, unpaved roads and staging areas. ❖ Water site and equipment every three hours during active construction periods. ❖ Sweep all streets at least once per day using SCAQMD Rule 1186 certified street sweepers or roadway washing trucks if visible soil materials are carried to adjacent streets. ❖ Suspend grading activities during first and second stage smog alerts and during high winds in accordance with SCAQMD Rule 403 requirements. ❖ If necessary, wash off trucks leaving the site. ❖ Cover haul trucks.	Potentially significant for oxides of nitrogen.
Biological Resources		
None	None required.	N/A
Cultural Resources		
None.	Although no evidence of cultural resources was found at the project site, it is always possible that cultural resources could be unearthed during excavation. Therefore, EMWD should include the following mitigation measures in its standard construction specifications: ❖ If inadvertent discoveries of cultural resources are encountered at any time	Less than significant.

Impact	Recommended Mitigation Measures	Level of Significance After Mitigation
	during construction, construction personnel shall avoid altering these materials and their context until a qualified archeologist has evaluated the situation and contacted the State Office of Historic Preservation and the closest Indian Tribe to the Project. Project personnel shall not collect or retain cultural resources. Prehistoric resources include, but are not limited to: chert or obsidian flakes; projectile points; mortars and pestles; dark, friable soil containing shell and bone; dietary debris; heat-affected rock; or human burials. Historic resources include stone or adobe foundations or walls; structures and remains with square nails; and refuse deposits (glass, metal, wood, ceramics), often found in old wells and privies. ❖ If paleontological resources (e.g., fossils) are encountered at any time during construction of the project, construction personnel shall avoid altering these materials and their context until a qualified paleontologist has evaluated the situation. Project personnel shall not collect or retain paleontological resources. ❖ In the event of an accidental discovery or recognition of any human remains, the County Coroner shall be notified and construction activities at the affected work site shall be halted. If the remains are found to be Native American, the Native American Heritage Commission shall be notified within 24 hours. The NAHC must identify a Most Likely Descendant(s) under Public Resources Code §5097.98 within 48 hours of receiving such notification. Guidelines of the Native American Heritage Commission shall be adhered to in the treatment and disposition of the remains in accordance with the provisions of Health and Safety Code §7050.5 and Public Resources Code §5097.98.	
Geology and Soils		
None.	None required.	N/A
Hazards and Hazardous Materials		
During construction, the contractor would utilize	To reduce potentially hazardous conditions and	Less than

Impact	Recommended Mitigation Measures	Level of Significance After Mitigation
equipment that uses petroleum based fuels and lubricants, which are subject to both leakage from engine blocks and containers or spilling during refueling and lubrication operations.	minimize the impacts from the handling of potentially hazardous materials, EMWD should include the following in its construction contract documents: ❖ The contractor(s) shall enforce strict on-site handling rules to keep construction and maintenance materials out of receiving waters and storm drains. In addition, the contractor(s) shall store all reserve fuel supplies only within the confines of a designated construction staging area, refuel equipment only within the designated construction staging area, and regularly inspect all construction equipment for leaks. ❖ The contractor(s) shall prepare a *Health and Safety Plan* in compliance with the requirements of Chapter 6.95, Division 20 of the Health and Safety Code (§§ 25500—25532). The plan shall include measures to be taken in the event of an accidental spill. ❖ The construction staging area shall be designed to contain contaminants such as oil, grease, and fuel products so that they do not drain towards receiving waters or storm drain inlets.	significant.
Hydrology and Water Quality		
Potential impacts to water quality due to sediment laden runoff from the construction sites.	EMWD shall require contractors to implement a program of best management practices (BMP's) and best available technologies to reduce potential impacts to water quality that may result from construction activities. To reduce or eliminate construction-related water quality impacts before the onset of construction activities, EMWD shall obtain coverage under the National Pollutant Discharge Elimination System (NPDES) General Construction Permit. Construction activities shall comply with the conditions of this permit that include preparation of a storm water pollution prevention plan, implementation of BMP's, and monitoring to insure impacts to water quality are minimized. As part of this process, multiple BMP's shall be implemented to provide effective erosion and sediment control. These BMP's shall be selected to achieve maximum sediment removal and represent the best available technology that is economically achievable. BMP's to be implemented as part of this mitigation measure shall include, but not be limited to, the following: ❖ Temporary erosion control measures such as	Less than significant.

Impact	Recommended Mitigation Measures	Level of Significance After Mitigation
Construction site dewqtering activities could have a potential effect on downstream water quality.	silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other groundcover shall be employed for disturbed areas. ❖ Storm drain inlets on the site and in downstream offsite areas shall be protected from sediment with the use of BMP's acceptable to EMWD, local jurisdictions and the California Regional Water Quality Control Boards, Santa Ana or San Diego Regions. ❖ Dirt and debris shall be swept from paved streets in the construction zone on a regular basis, particularly before predicted rainfall events. ❖ No disturbed surfaces shall be left without erosion control measures in place between October 15 and April 15. EMWD shall file a Notice of Intent with the Regional Board and require the preparation of a pollution prevention plan prior to commencement of construction. EMWD shall routinely inspect the construction site to verify that the BMP's specified in the pollution prevention plan are properly installed and maintained. EMWD shall immediately notify the contractor if there were a noncompliance issue and require immediate compliance. ❖ Controls on construction site dewatering shall be implemented. If possible, water generated as part of construction dewatering shall be discharged onsite such that there would be no discharge to surface waters. If discharge to surface waters were unavoidable, EMWD shall obtain coverage under the NPDES General Dewatering Permit prior to commencement of construction. The provisions of this permit are sufficiently protective of water quality to ensure that impacts to surface waters would remain below significance thresholds. During dewatering activities, all permit conditions shall be followed. EMWD shall routinely inspect the construction site to verify that the measures specified in the permit are properly implemented. EMWD shall immediately notify the contractor if there were a noncompliance issue and require immediate compliance.	Less than significant.
Land Use and Planning		
None.	None Required.	N/A

Impact	Recommended Mitigation Measures	Level of Significance After Mitigation
Mineral Resources		
None.	None Required.	N/A
Noise		
Construction activities would temporarily increase the ambient noise levels in the Project area.	EMWD should include the following in its standard construction specifications: ❖ Construction activities shall be limited to between the hours of 7:00 am and 7:00 pm and as necessary to comply with local ordinances. Any holiday, nighttime or weekend construction activities shall be subject to local permitting requirements. ❖ All equipment used during construction shall be muffled and maintained in good operating condition. All internal combustion engines shall be fitted with well maintained mufflers in accordance with manufacturers' recommendations. ❖ The contractor shall contact each school prior to conducting work adjacent to the school grounds.	Less than significant.
Population and Land Use		
None.	None Required	N/A
Public Services		
None.	None Required	N/A
Recreation		
None.	None Required	N/A
Traffic/Transportation		
During construction, there could be times that traffic would be disrupted on local streets.	The following mitigation measures should be complied with to reduce the traffic/transportation impacts: ❖ Traffic control plans shall be prepared by a qualified professional engineer prior to construction. ❖ Traffic control plans shall consider the ability of alternative routes to carry additional traffic and identify the least disruptive hours of construction site truck access routes and the type and location of warning signs, lights and other traffic control devices. Consideration shall be given to maintaining access to commercial parking lots, private driveways and sidewalks, bikeways and equestrian traffic to the greatest extent possible. ❖ Traffic control plans shall comply with Part 6 of the California Manual on Traffic Control Devices as determined by each affected local agency to minimize any traffic and pedestrian hazards that exist during project	Less than Significant

Impact	Recommended Mitigation Measures	Level of Significance After Mitigation
	construction. ❖ Encroachment permits for all work within public rights-of-way shall be obtained from each affected agency prior to commencement of any construction. EMWD shall comply with all traffic control requirements of the appropriate agencies. ❖ Public streets shall be kept operational during construction, particularly during the morning and evening peak hours of traffic. Lane closures shall be minimized during peak traffic hours. ❖ Public streets shall be restored to a condition mutually agreed to between EMWD and the appropriate agencies prior to construction. ❖ Emergency service providers shall be contacted and consulted to preclude the creation of unnecessary traffic bottlenecks that would seriously impede response times. Additionally, measures to provide an adequate level of access to private properties shall be maintained to allow delivery of emergency services.	
Utilities and Service Systems		
None.	None Required	N/A

Areas of Controversy

Section 15123(b)(2) of the CEQA Guidelines requires that the summary in an environmental impact report include the discussion of areas of controversy known to the Lead Agency including issues raised by agencies and the public.

There are no known areas of controversy regarding the Recycled Water Distribution Pipeline Expansion Project.

Issues to be Resolved

Section 15123(b)(3) of the CEQA Guidelines requires that the summary in an environmental impact report include a discussion of the issues to be resolved including the choice among alternatives and whether or how to mitigate the significant effects.

There only issue to be resolved regarding the Recycled Water Distribution Pipeline Expansion Project is the final alignment of the 12-inch diameter pipeline in Indian Avenue (PN-1). This issue will be resolved

as soon as the City of Perris determines the final alignment of the reconstructed Indian Avenue in this area.

Document Availability and Contact Personnel

The Environmental Assessment/Draft Environmental Impact Report is available for review at the following locations:

Eastern Municipal Water District
2270 Trumble Road
Perris, California 92570

http://www.emwd.org/news/publicnotices.html

Bureau of Reclamation
U.S. Department of the Interior
27708 Jefferson Avenue
Temecula, California 93590

All questions and comments regarding the Project or environmental document should be forwarded to:

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Environmental Assessment/ Draft Environmental Impact Report

Recycled Water Distribution Pipeline Expansion Project

(SCH No. 2010031001)

Prepared for:

Eastern Municipal Water District
Post Office Box 8300
Perris, California 92572-8300

U.S. Bureau of Reclamation
27708 Jefferson Avenue
Temecula, California 92390

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June 2010

1 Introduction

Introduction

The following Environmental Assessment/Draft Environmental Impact Report (EA/DEIR) addresses the environmental impacts associated with the construction and operation of a recycled water distribution project proposed by Eastern Municipal Water District (EMWD). This EA/DEIR has been prepared in accordance with the *California Environmental Quality Act of 1970,* as amended, (CEQA), the *State CEQA Guidelines,* and Eastern Municipal Water District's Resolution No. 1189.7, as amended. EMWD is the Lead Agency for the purposes of CEQA for this project. EMWD is seeking federal financial assistance in implementing the Project under Title XVI funding. Therefore, this document also serves to satisfy the U.S. Bureau of Reclamation's responsibilities under the National Environmental Policy Act (NEPA).

Proposed Action

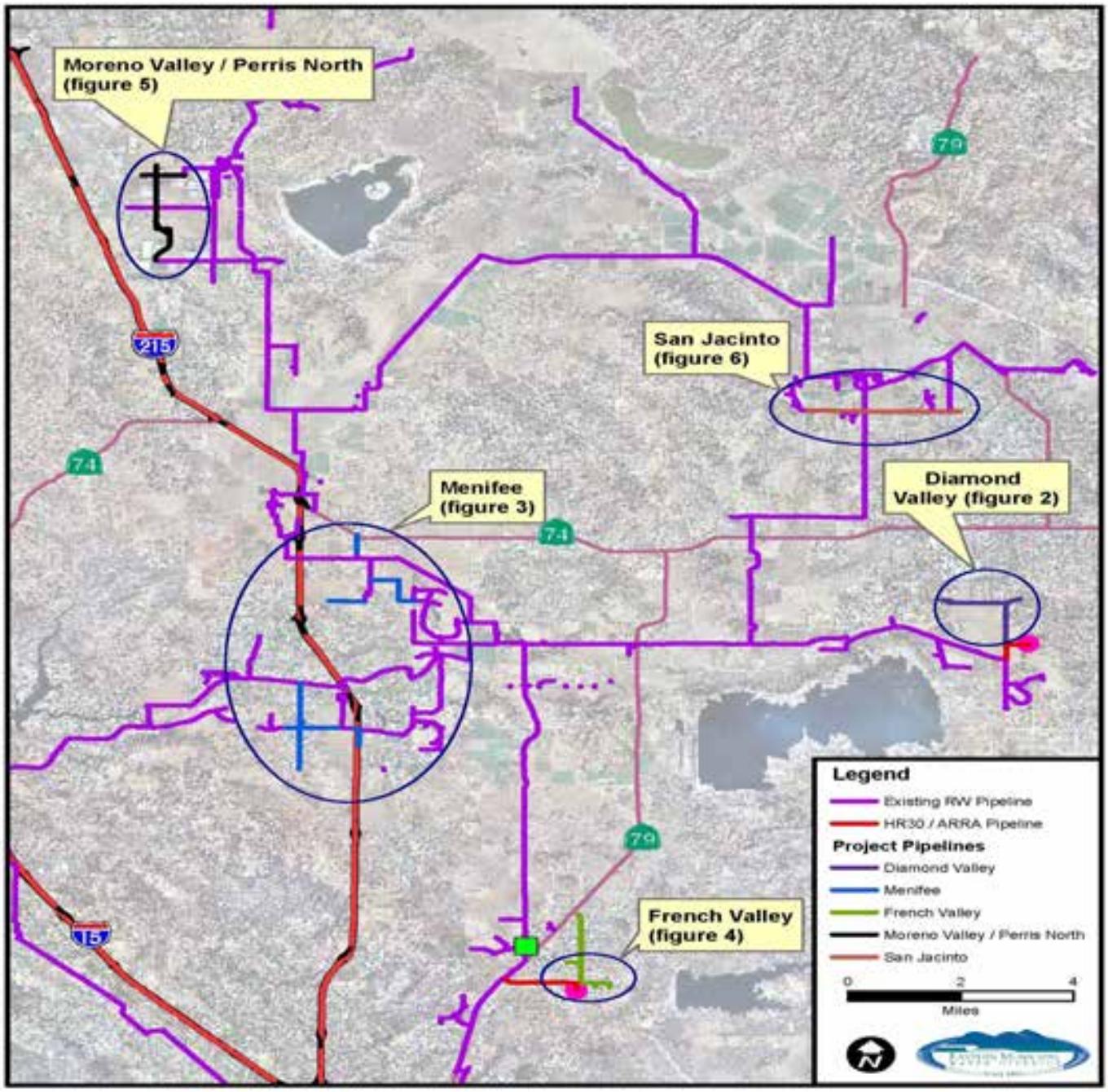
The Recycled Water Distribution Project (Project) is broken up into five "sub-projects" based on geographic location (Figure 1-1). These are: Diamond Valley, Menifee, French Valley, Moreno Valley/Perris North and San Jacinto. Combined these projects include approximately 89,405 lineal feet (16.9 miles) of pipeline varying in size from 8-inch diameter up to 24-inch diameter. The breakdown by diameter is as follows: 5,745 lineal feet of 8-inch diameter pipeline, 67,258 lineal feet of 12-inch diameter pipeline, 9,752 lineal feet of 18-inch diameter pipeline, and 6,650 lineal feet of up to 24-inch diameter pipeline.

California Environmental Quality Act Compliance

The California Environmental Quality Act (California Public Resources Code §21000 *et seq.*: "CEQA"), requires that the environmental impacts of proposed projects be evaluated and that feasible methods to reduce, avoid or eliminate significant adverse impacts of these projects be identified and eliminated. Therefore, to fulfill the purpose and intent of CEQA, EMWD, as the lead agency, has caused this DEIR to be prepared to address the potentially significant adverse environmental impacts associated with the construction and operation of the Project.

Lead Agency

The Lead Agency is "*. . . the public agency that has the principal responsibility for carrying out or approving a project that may have a significant effect upon the environment*" (Public Resources Code §21067). The Lead Agency for this Project is EMWD, a municipal water district organized and operating pursuant to the Municipal Water District Law of 1911 (California Water Code §71000 *et seq.*). Within its 555 square mile service area, which covers both the Santa Ana and Santa Margarita



Note: Figures referenced above are included in Chapter 2, Project Description.

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Figure 1-1
Recycled Water Distribution Pipelines

Environmental Assessment/Draft Environmental Impact Report
Recycled Water Distribution Pipeline Expansion Project
U.S. Bureau of Reclamation/Eastern Municipal Water District

River watersheds, EMWD sells water to over 80,000 homes and businesses, and seven cities and local water agencies purchase water from EMWD on a supplemental basis. EMWD also treats the wastewater produced by its customers to a tertiary level and disposes of the highly treated wastewater in accordance with the regulatory requirements and permits issued by the California Regional Water Quality Control Boards for the Santa Ana and San Diego Regions, the State Water Resources Control Board, the California Department of Public Health and the United States Environmental Protection Agency ("EPA").

Responsible Agencies

CEQA Guidelines §15381 defines a "responsible agency" as ". . . *a public agency which proposes to carry out or approve a project, for which a Lead Agency is preparing or has prepared an EIR or Negative Declaration."* For the purposes of CEQA, responsible agencies include all public agencies other than the lead agency that have discretionary approval authority over the project. Responsible agencies for this Project include the State Water Resources Control Board, Division of Financial Assistance; California Regional Water Quality Control Board, Santa Ana and San Diego Regions; California Department of Transportation; County of Riverside; the Cities of San Jacinto, Hemet, Perris, Menifee and Moreno Valley; and The Metropolitan Water District of Southern California.

Trustee Agencies

§15386 of the State CEQA Guidelines defines "Trustee Agency" as a state agency having jurisdiction by law over natural resources affected by a project which are held in trust for the people of the State of California. For the purposes of the proposed Project, Trustee Agencies include the California Department of Fish and Game with regard to the fish and wildlife of the State, to designated rare or endangered native plants, and to game refuges, ecological reserves, and other areas administered by the department. Other Trustee Agencies which do not have jurisdiction over the proposed Project include: the State Lands Commission, the State Department of Parks and Recreation, and the University of California.

California Environmental Quality Act

The basic purposes of CEQA as set forth in §15002 of the State CEQA Guidelines are:

1. *Inform the governmental decision-makers and the public about the potential significant environmental effects of proposed activities.*
2. *Identify the way that environmental damage can be avoided or significantly reduced.*
3. *Prevent significant avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds changes to be feasible.*

4. *Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.*

The first three purposes of CEQA fall within the province of the EIR. The fourth purpose is completed by the Lead Agency after its consideration and approval of the Final EIR and at the time it makes its decision on the project, mitigation measures, or alternatives.

Contents of an EIR

An EIR is defined in §15362 of the State CEQA Guidelines as being a detailed statement prepared under CEQA describing and analyzing the significant environmental effects of a project and discussing ways to mitigate or avoid the effects. The contents of an EIR are discussed in CEQA Article 9 commencing with §15120.

This section specifies that a Draft EIR shall contain the information required by §§15122 through 15131. The topic of each of these sections is cited below:

Guidelines	Topic
§15122	Table of Contents or Index
§15123	Summary
§15124	Project Description
§15125	Environmental Setting
§15126	Consideration and Discussion of Environmental Impacts

a. Significant Environmental Effects of the Proposed Project.

b. Significant Environmental Effects Which Cannot be Avoided if the Proposal is Implemented.

c. Significant Irreversible Environmental Changes Which Would be Involved in the Proposed Project Should it be Implemented.

d. Growth Inducing Impact of the Proposed Project.

e. The Mitigation Measures Proposed to Minimize the Significant Effects.

f. Alternatives to the Proposed Project.

§15127 Limitations on Discussion of Environmental Impact

§15128 Effects Not Found to be Significant

§15129 Organizations and Persons Consulted

§15130 Discussion of Cumulative Impacts

§15131 Economic and Social Effects

Adequacy of an EIR

The standards for adequacy of an EIR cited in §15151 of the State CEQA Guidelines are as follows:

> An EIR should be prepared with sufficient degree of analysis to provide decision-makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure.

DEIR Review and Consideration Process

The DEIR for the proposed Project will be subject to a 45-day review period. Interested individuals, organizations and agencies can provide written comments on the document during the review period.

During the public review period, the DEIR will be circulated for review by responsible agencies, trustee agencies and interested individuals. Prior to the preparation of the DEIR, a Notice of Preparation (NOP) was prepared and distributed to responsible agencies, trustee agencies and interested individuals for their comment. A copy of the NOP is provided in Appendix A of this document. Chapter 21 contains a summary of the written comments submitted in response to the NOP as well as EMWD's responses to those comments. Copies of the actual comment letters are provided in Appendix B of this document.

Comments and questions on the DEIR received during the review period will be compiled in a Consultation Summary document. Copies of the Consultation Summary document will be provided to all who commented at least 10 days prior to certification of the Final Environmental Impact Report (FEIR). The DEIR and Consultation Summary document will constitute the FEIR for the proposed Project.

After examining the FEIR, EMWD will determine whether or not to certify that the FEIR is adequate and has been completed in compliance with CEQA. It should be noted that certification of an EIR does not constitute project approval; rather, it is a necessary step that precedes project approval. EMWD will consider the information in the FEIR in determining whether the proposed Project or reasonable alternatives should be approved, modified, or rejected.

In order for a Lead Agency to approve a project (after certifying the FEIR), it must prepare written findings for each significant adverse environmental effect identified in the EIR. Findings must be accompanied by a brief explanation of the rationale for each significance determination and should indicate that either: (1) changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant effects on the environment; (2) those changes or alterations are the responsibility and jurisdiction of another public agency and have been, or can be, adopted by that agency; or (3) specific economic, legal, social, technological or other considerations, including the consideration for the provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or alternatives identified in the EIR.

Intended Use of this EIR

Use of this EIR by the Eastern Municipal Water District

EMWD, as the Lead Agency, is the public agency responsible for implementing the proposed Project and fulfilling the requirements of CEQA via preparation of appropriate environmental documents for the proposed Project. This DEIR was prepared under contract to EMWD by K.S. Dunbar & Associates, Inc., Environmental Engineering. It will be used by EMWD during the decision-making process for the proposed Project. The EIR may also be used to satisfy the requirements of other agencies having jurisdiction over any of the proposed Project components that are eventually approved for implementation.

Approvals for which this DEIR will be Used

The following responsible and trustee agencies may also use this document in their decision-making process concerning the proposed Project.

U.S. Bureau of Reclamation

Funding Approval

U.S. Army Corps of Engineers

Nationwide Permit No. 18, if necessary

State Water Resources Control Board, Division of Financial Assistance

Funding Approval

California Regional Water Quality Control Board, Santa Ana Region

General Permit for Storm Water Discharges Associated with Construction Activity

General Permit for Construction Dewatering, if necessary.

Section 401 Water Quality Certification, if necessary.

California Regional Water Quality Control Board, San Diego Region

General Permit for Storm Water Discharges Associated with Construction Activity

General Permit for Construction Dewatering, if necessary.

Section 401 Water Quality Certification, if necessary.

California Department of Fish and Game

Streambed Alteration Agreement, if necessary.

California Department of Transportation

Encroachment Permit

County of Riverside

Encroachment Permit

City of San Jacinto

Encroachment Permit

City of Hemet

Encroachment Permit

City of Perris

Encroachment Permit

City of Menifee

Encroachment Permit

Haul Permit, if necessary

City of Moreno Valley

Encroachment Permit

The Metropolitan Water District of Southern California

Funding Approval

Lead Agency Decisions Subject to CEQA

EMWD must make several decisions regarding the proposed Project that are subject to the requirements of CEQA. These decisions will include, but are not limited to, the following:

a. Review the DEIR and direct preparation of the FEIR[1].

b. Certify the FEIR in accordance with §15090 of the State CEQA Guidelines.

c. Make Findings in accordance with §15091 of the State CEQA Guidelines.

d. Adopt a Statement of Overriding Considerations for the Project in accordance with §15093 of the State CEQA Guidelines.

e. Adopt mitigation measures and a Mitigation Monitoring and Reporting Program for the Project.

f. Approve the Project in accordance with §15092 of the State CEQA Guidelines.

g. Authorize financing of the Project.

National Environmental Policy Act Compliance

Introduction

Due to the fact that EMWD may seek financial assistance from the U.S. Bureau of Reclamation to implement this Project, it is necessary to also comply with the provisions of the National Environmental Policy Act (NEPA).

According to 43 CFR 46.300[2], the purpose of an Environmental Assessment (EA) is to allow the Responsible Official to determine whether to prepare an Environmental Impact Statement (EIS) or Finding of No Significant Impact (FONSI).

Public Involvement

The need for public involvement during the preparation of an EA is described in 43 CFR 46.305 as follows:

[1] NOTE: In accordance with §15132 of the State CEQA Guidelines, the FEIR will consist of the DEIR plus a supplement. The supplement will consists of the comments and recommendations received on this DEIR; a list of persons, organizations, and public agencies commenting on this DEIR; EMWD's responses to significant environmental points raised in the review and consultation process; and any other information added by EMWD.
[2] 43 CFR 46.300 means Title 43 Code of Federal Regulations, Section 46.300.

a. *The bureau must provide for public notification when an EA is being prepared. The bureau must, to the extent practicable, provide for public involvement when an EA is being prepared. However, the method for providing opportunities for public involvement is at the discretion of the bureau.*

   1. *The bureau must consider comments resulting from the notice that are timely received, whether specifically solicited or not.*

   2. *Although scoping is not required, the bureau may apply a scoping process to an EA.*

b. *Publication of a "draft" EA is not required. Bureaus may seek comments on an EA if they determine it to be appropriate, such as when the level of public interest or the uncertainty of effects warrants.*

c. *The bureau must notify the public of the availability of an EA and any associated FONSI once they have been completed. Comments on a FONSI must be solicited only as required by 40 CFR 1501.4(e)(2).*

d. *Bureaus may allow cooperating agencies (as defined in §46.225) to participate in developing EAs.*

Contents of an EA

According to 43 CFR 46.310, the contents of an EA shall include:

a. At a *minimum, an EA must include brief discussions of:*

   1. *The proposal;*

   2. *The need for the proposal;*

   3. *The environmental impacts of the proposed action;*

   4. *The environmental impacts of the alternatives considered; and*

   5. *A list of agencies and persons consulted.*

b. *When there is consensus about the proposed action with respect to alternative uses of available resources, the EA need only consider the proposed action and proceed without consideration of additional alternatives, including the no action alternative. (See section 102(2)(e) of NEPA).*

c. *In addition, an EA may describe a broader range of alternatives to facilitate planning and decision-making.*

d. *A proposed action or alternative(s) may include adaptive management strategies allowing for adjustment of the action during implementation. If the adjustments to an action are clearly articulated and pre-specified in the description of the alternative and fully analyzed, then the action may be adjusted during implementation without the need for further analysis. Adaptive management includes a monitoring component, approved adaptive actions that may be taken, and environmental effects analysis for the adaptive actions approved.*

e. *The level of detail and depth of impact analysis should normally be limited to the minimum needed to determine whether there would be significant environmental effects.*

f. *Bureaus may choose to provide additional detail and depth of analysis as appropriate in those EAs prepared under §46.300(b).*

g. *An EA must contain objective analyses that support conclusions concerning environmental impacts.*

Adopting EAs Prepared by Another Agency, Entity, or Person

43 CFR 46.320 states:

a. A *Responsible Official may adopt an EA prepared by another agency, entity or person, including an applicant, if the Responsible Official:*

   1. *Independently reviews the EA; and*

   2. *Finds that the EA complies with this subpart and relevant provisions of the CEQ Regulations and with other program requirements.*

b. *When appropriate, the Responsible Official may augment the EA to be consistent with the bureau's proposed action.*

c. *In adopting or augmenting the EA, the Responsible Official will cite the original EA.*

d. *The Responsible Official must ensure that its bureau's public involvement requirements have been met before it adopts another agency's EA.*

Lead Agency Decision-Making Process

When an Environmental Assessment has been prepared, the Responsible Official shall review the document and determine whether the proposed action may have a significant effect on the quality of the human environment. The Council of Environmental Quality (CEQ) Regulations define a finding of no significant impact (FONSI) as:

> *… a document by a Federal agency briefly presenting the reasons why an action, not otherwise excluded (§1508.4), will not have a significant effect on the human environment and for which an*

> *environmental impact statement therefore will not be prepared. It shall include the environmental assessment or a summary of it and shall note any other environmental documents related to it [§1501.7(a)(5)]. If the assessment is included, the finding need not repeat any of the discussion in the assessment but may incorporate it by reference. (40 CFR 1508.13)*

If the Responsible Official determines that the proposed action may have a significant effect on the quality of the human environment, a notice of intent to prepare an environmental impact statement (EIS) would be published in the Federal Register. Otherwise a FONSI would be prepared.

Document Availability and Contact Personnel

The Environmental Assessment/Draft Environmental Impact Report is available for review at the following locations:

Eastern Municipal Water District
2270 Trumble Road
Perris, California 92570

http://www.emwd.org/news/publicnotices.html

Bureau of Reclamation
U.S. Department of the Interior
27708 Jefferson Avenue
Temecula, California 93590

All questions and comments regarding the Project or environmental document should be forwarded to:

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2 Project Background and Description

Project Background

In 2003, Eastern Municipal Water District (EMWD) adopted its *Mandatory Use Policy for Recycled Water* and began working with developers to design and construct facilities and irrigation systems for recycled water use. In many cases, these facilities are presently being supplied with potable water in anticipation of future recycled water availability. These developer projects are considered "conversions" and are located throughout EMWD's service area. These conversion projects have been strategically located in geographic vicinities which are both close to existing large potable water landscape users (retrofits) and planned future development.

Subsequently in June 2009, EMWD completed its *Recycled Water Strategic Plan.* Two of the stated objectives in this plan are: 1) fully utilize 100% of recycled water within EMWD's service area and 2) maximize potable water offsets. In order to meet these objectives, EMWD's *Recycled Water Strategic Plan* has allocated current and future recycled water supplies to serve conversions, retrofits and future development. Facility improvements (secondary distribution piping) must be completed in order to deliver recycled water to both conversions and retrofits. In 2009, EMWD began a retrofit planning study through a grant from the California State Water Resources Control Board (State Water Board). This study will further evaluate retrofit opportunities throughout EMWD and is anticipated to be completed by the last quarter of 2010. EMWD is also in the process of applying for Local Resources Program (LRP) funding through The Metropolitan Water District of Southern California (MWD).

Pursuant to the *Mandatory Use Policy for Recycled Water* and the *Recycled Water Strategic Plan,* EMWD is actively pursuing landscape demand for maximizing the beneficial use of recycled water to offset potable water demand. In conjunction with the HR30/ARRA[1] system stabilization projects, the Recycled Water Distribution Project (Project) is intended to design and construct secondary distribution piping to serve existing landscape demand while supporting future development. The existing demand is both retrofits and conversions and will benefit EMWD by providing an immediate reduction of approximately 2,000 acre-feet annually (afa) of potable water demand while helping to support an additional 5,300 afa of new development landscape demand.

Project Description

The Recycled Water Distribution Expansion Pipeline Project (Project) is broken up into five "sub-projects" based on geographic location (Figure 2-1). These are: Diamond Valley, Menifee, French

[1] H.R. 30 means House Resolution No. 30, which amended the Reclamation Wastewater and Groundwater Study and Facility Act to authorize the Secretary of the Interior to participate in the Eastern Municipal Water District Recycled Water Pressurization and Expansion Project. ARRA means the American Recovery and Reinvestment Act.

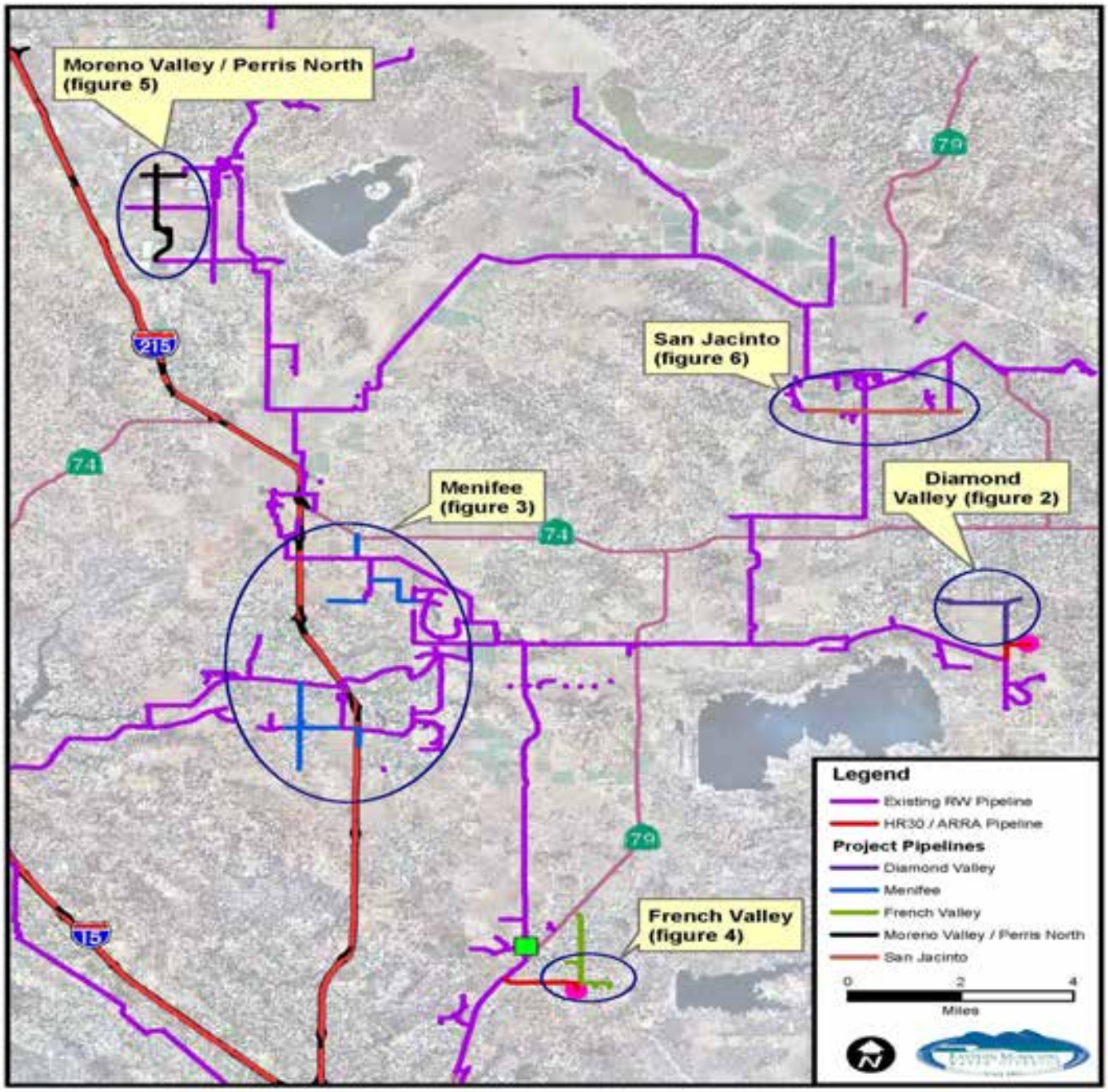

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Figure 2-1
Recycled Water Distribution Pipelines

Environmental Assessment/Draft Environmental Impact Report
Recycled Water Distribution Pipeline Expansion Project
U.S. Bureau of Reclamation/Eastern Municipal Water District

Valley, Moreno Valley/Perris North and San Jacinto. Combined these projects include approximately 89,405 lineal feet (16.9 miles) of pipeline varying in size from 8-inch diameter up to 24-inch diameter. The breakdown by diameter is as follows: 5,745 lineal feet of 8-inch diameter pipeline, 67,258 lineal feet of 12-inch diameter pipeline, 9,752 lineal feet of 18-inch diameter pipeline, and 6,650 lineal feet of up to 24-inch diameter pipeline. The "sub-projects" are described in more detail in the following paragraphs.

Diamond Valley

The Diamond Valley Recycled Water Distribution Expansion Pipeline Sub-Project would tie into EMWD's new Gibbel Road Recycled Water Storage Tank and Pipeline Project presently being constructed with the assistance of HR 30 and ARRA funding (Figure 2-2). As shown on Figure 2-2 a new up to 24-inch diameter recycled water pipeline (DV-1) would be constructed in State Street a distance of approximately 5,250 lineal feet from the 24-inch diameter recycled water pipeline at the intersection of State Street and Simpson Road north to Chambers Street. An additional 1,400 lineal feet of up to 24-inch diameter pipeline (DV-2) would be constructed in Chambers Street easterly from State Street to its intersection with Lyon Road. This sub-project would also include approximately 1,100 lineal feet of 8-inch diameter recycled water pipeline (DV-4) in Lyon Avenue northerly from Chambers Street to Pepper Tree Drive and easterly along Pepper Tree Drive to the Seven Hills Golf Course. In addition, approximately 1,400 lineal feet of up to 24-inch diameter pipeline (DV-3) would be installed in Chambers Street in a westerly direction to the Echo Hills Golf Course at Buena Vista Street. A summary of pipeline locations, sizes and lengths is provided in Table 2-1.

Table 2-1
Diamond Valley Recycled Water Distribution Summary

Pipeline ID (Fig. 2-2)	Street Alignment	From Street	To Street	Size (inches)	Length (feet)
DV-1	State Street North	Simpson	Chambers	up to 24	5,250
DV-2	West Chambers	State Street	Lyon Avenue	12	5,300
DV-3	East Chambers	State Street	Buena Vista Street	Up to 24	1,400
DV-4	Lyon Ave./Pepper Tree Drive	Chambers	800 ' E on Pepper Tree	8	1,100
				Totals	**13,050**

Note: General pipeline alignment shall be on the north or east side of the street at 7' from existing or future face of curb.

Menifee

The Menifee Recycled Water Distribution Expansion Pipeline Sub-Project would consist of two subareas (i.e., Menifee South and Menifee North).

As shown on Figure 2-3, the Menifee South subarea would include approximately 2,040 lineal feet of 8-inch diameter pipeline (M1) installed in Antelope Road (freeway frontage road) between a point approximately 320 feet north of Holland Road northerly to La Piedra Road (basically in front of Mount San Jacinto College, Menifee Valley Campus). At La Piedra Road, a jack and bore (M7) (approximately 500 lineal feet) would be completed under Interstate 215. This would connect existing recycled water

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Figure 2-2
Diamond Valley Recycled Water Distribution Pipelines

Environmental Assessment/Draft Environmental Impact Report
Recycled Water Distribution Pipeline Expansion Project
U.S. Bureau of Reclamation/Eastern Municipal Water District

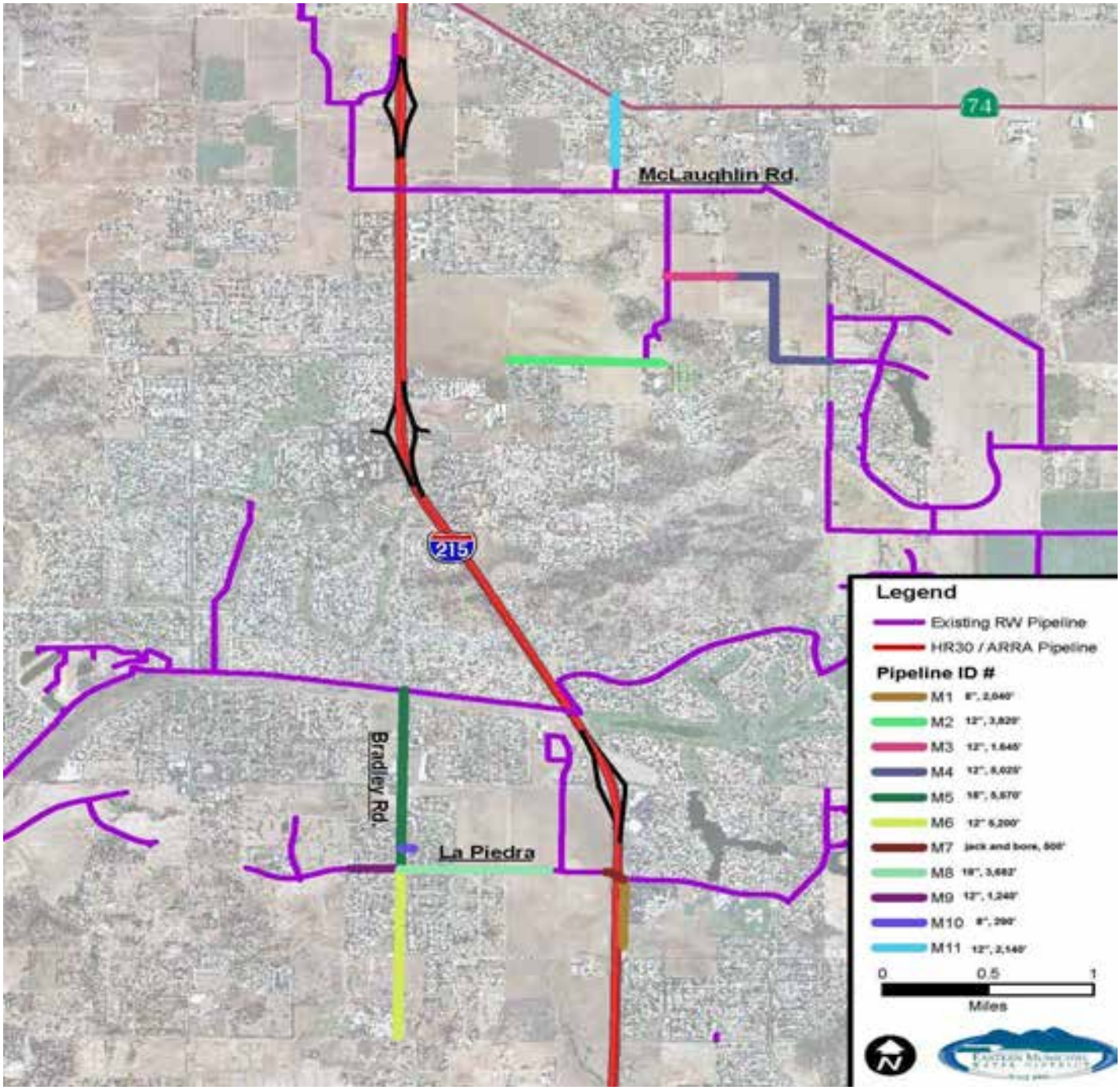

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Figure 2-3
Menifee Recycled Water Distribution Pipelines

Environmental Assessment/Draft Environmental Impact Report
Recycled Water Distribution Pipeline Expansion Project
U.S. Bureau of Reclamation/Eastern Municipal Water District

pipelines in La Piedra Road on both sides of I-215. Approximately 3,682 lineal feet of 18-inch diameter pipeline (would be installed in La Piedra Road from approximately 250 feet west of its intersection with Haun Road in a westerly direction to Bradley Road (M-8). At Bradley Road the 18-inch diameter pipeline would be reduced in size to 12-inch diameter. The 12-inch diameter pipeline (M9) would follow La Piedra Road in a westerly direction from Bradley to approximately 60 feet west of its intersection with Pine Creek Drive. A new pipeline would also be installed in Bradley Road from north of the Salt Creek Channel in a southerly direction to approximately 100 feet north of its intersection with Craig Avenue. From Salt Creek to La Piedra Road, approximately 5,570 lineal feet of 18-inch diameter pipeline (M5) would be installed. South of La Piedra Road, approximately 5,200 lineal feet of 12-inch diameter pipeline (M6) would be installed. In addition, approximately 290 lineal feet of 8-inch diameter pipeline (M10) would be installed in School Park Drive between Bradley Road and about 110 feet east of its intersection with Lamdin Lane.

Also as shown on Figure 2-3, the Menifee North subarea would include the installation of approximately 2,140 lineal feet of 12-inch diameter pipeline (M11) in Antelope Road from just north of Highway 74 southerly to approximately 775 feet north of its intersection with McLaughlin Road. It would also include approximately 1,645 lineal feet of 12-inch diameter pipeline (M3) installed in Rouse Road from San Jacinto Road to approximately 250 feet east of its intersection with Palomar Road. From that point approximately 5,025 lineal feet of 12-inch diameter pipeline (M4) would be installed within Rouse Road, Junipero Road and McCall Boulevard to McCall's intersection with Menifee Road. In addition, approximately 3,820 lineal feet of 12-inch diameter pipeline (M2) would be installed in Chambers Avenue between its intersection with Sherman Road and 525 feet east of its intersection with Aspel Road. A summary of pipeline locations, sizes and lengths is provided in Table 2-2.

Table 2-2
Menifee Recycled Water Distribution Summary

Pipeline ID (Fig. 2-3)	Street Alignment	From Street	To Street	Size (inches)	Length (feet)
M-1	Antelope Road	La Piedra	320' N of Holland	8	2,040
M-2	Chambers Avenue	525' east of Aspel	Sherman	12	3,820
M-3	Rouse Road	San Jacinto Rd.	250' E of Palomar	12	1,645
M-4	Rouse, Junipero & McCall	250' east of Palomar	Menifee	12	5,025
M-5	Bradley north of La Piedra	La Piedra	N of Salt Creek Channel	18	5,570
M-6	Bradley south of La Piedra	La Piedra	100' N of Craig Ave	12	5,200
M-7	Jack & Bore I-215	Antelope Road	120' W I-215	--	500
M-8	La Piedra E of Bradley	Bradley Road	250' W of Haun Rd	18	3,682
M-9	La Piedra W of Bradley	Bradley Road	60' W of Pine Creek Dr	12	1,240
M-10	School Park Drive	Bradley Road	110' E of Lamdin Ln	8	290
M-11	Antelope Road	775' N of McLaughlin	N of Highway 74	12	2,140
				Totals	**31,152**

Note: General pipeline alignment shall be on the north or east side of the street at 7' from existing or future face of curb.

French Valley

The French Valley Recycled Water Distribution Expansion Pipeline Sub-Project includes five pipelines that would be served by the Benton Road Recycled Water Storage Tank and Pipeline that will be constructed with the assistance of HR30/ARRA funding. As shown on Figure 2-4, approximately 3,100 lineal fee of 12-inch diameter pipeline (FV-1) would be constructed within Benton Road from the new 24-inch diameter pipeline to be constructed at a point about 475 feet west of Pourroy Road in an easterly direction to Maddalena Road. In addition, approximately 8,660 lineal feet of 12-inch diameter pipeline (FV-2) would be installed in Pourroy Road from its intersection with Benton Road northerly to about 375 feet south of its intersection with Highway 79 (Winchester Road). A tee in this line at Thompson Road would feed approximately 1,340 lineal feet of 8-inch diameter pipeline (FV-4) in Thompson Road from Benton Road to about 300 feet east of Joltaire Way. In addition, two 8-inch diameter pipelines would tee off the proposed 12-inch diameter line in Benton Road in a southerly direction. These include approximately 425 lineal feet in Cady Road (FV-5) and 550 lineal feet in Maddalena Road (FV-3). A summary of pipeline locations, sizes and lengths is provided in Table 2-3.

Table 2-3
French Valley Recycled Water Distribution Summary

Pipeline ID (Fig. 2-4)	Street Alignment	From Street	To Street	Size (inches)	Length (feet)
FV-1	Benton Road	475’ W of Pourroy Road	Maddalena Road	12	3,100
FV-2	Pourroy Road	Benton Road	375’ S of Hiway 79	12	8,660
FV-3	Maddalena Road	Benton Road	200’ S of Fleurs Ln	8	550
FV-4	Thompson Road	Pourroy Road	300’ E of Joltaire Way	8	1,340
FV-5	Cady Road	Benton Road	75’ N of Beaulieu Road	8	425
				Totals	**14,075**

Note: General pipeline alignment shall be on the north or east side of the street at 7’ from existing or future face of curb.

Moreno Valley/Perris North

As shown on Figure 2-5, the Moreno Valley/Perris North Recycled Water Distribution Expansion Pipeline Sub-project includes two pipelines. EMWD proposes to install approximately 12,820 lineal feet of 12-inch diameter pipeline (PN-1) in Indian Avenue from Morgan Street to San Michele Road.

Due to the fact that the City of Perris has not yet realigned Indian Avenue between just north of Perry Street and Ramona Expressway, EMWD is also proposing an alternative alignment for PN-1 as shown on Figure 2-5. The alternative alignment would follow Indian Avenue from San Michele Road in a southerly direction to its intersection with Perry Street, then follow Perry Street in an easterly direction to its intersection with Barrett Avenue, and then southerly along Barrett Avenue to its intersection with Ramona Expressway. At this point, the alignment would again follow Indian Avenue in a southerly direction to its intersection with Morgan Street. The total length of this 12-inch diameter pipeline would be approximately 13,870 feet.

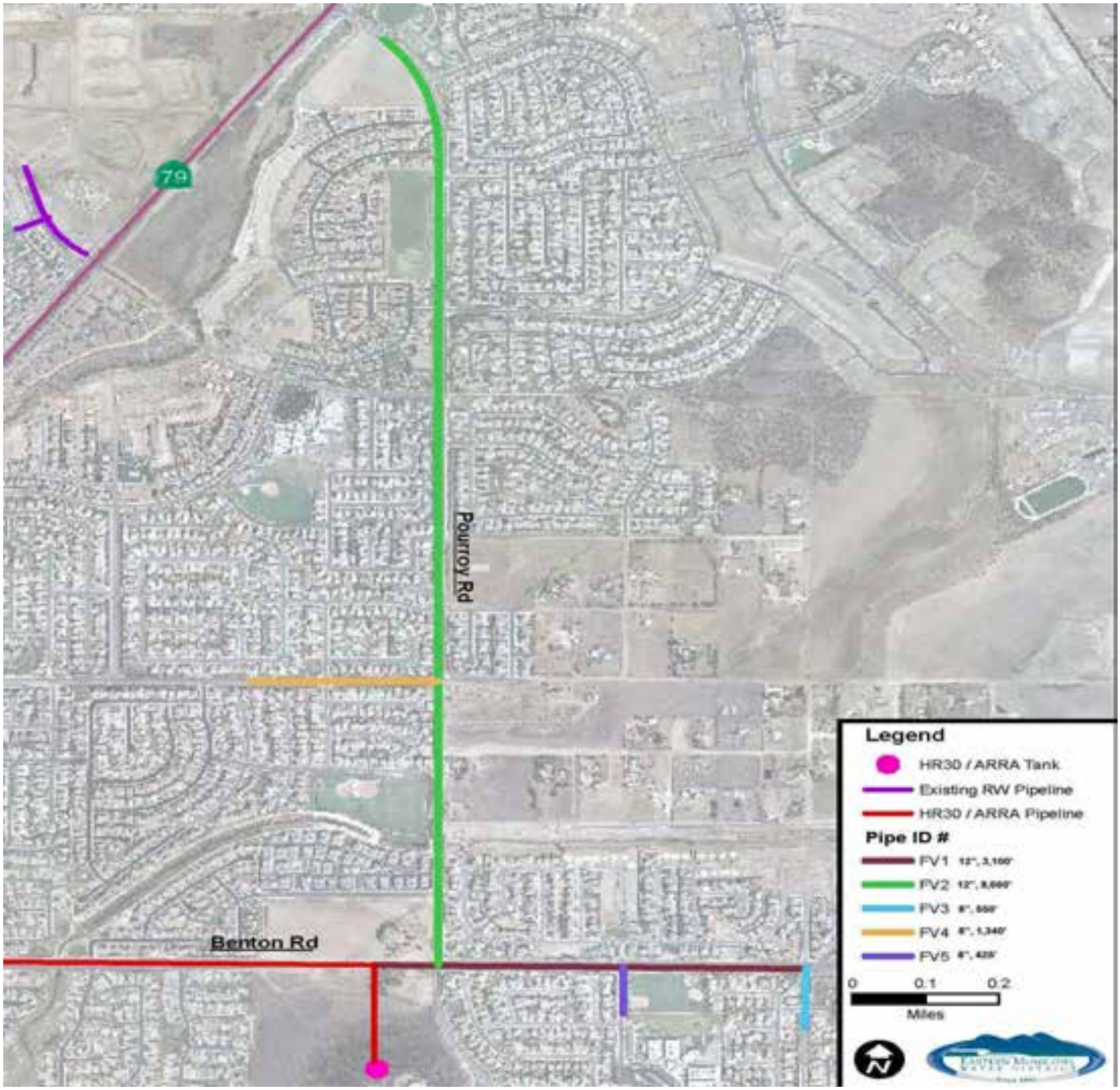

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Figure 2-4
French Valley Recycled Water Distribution Pipelines

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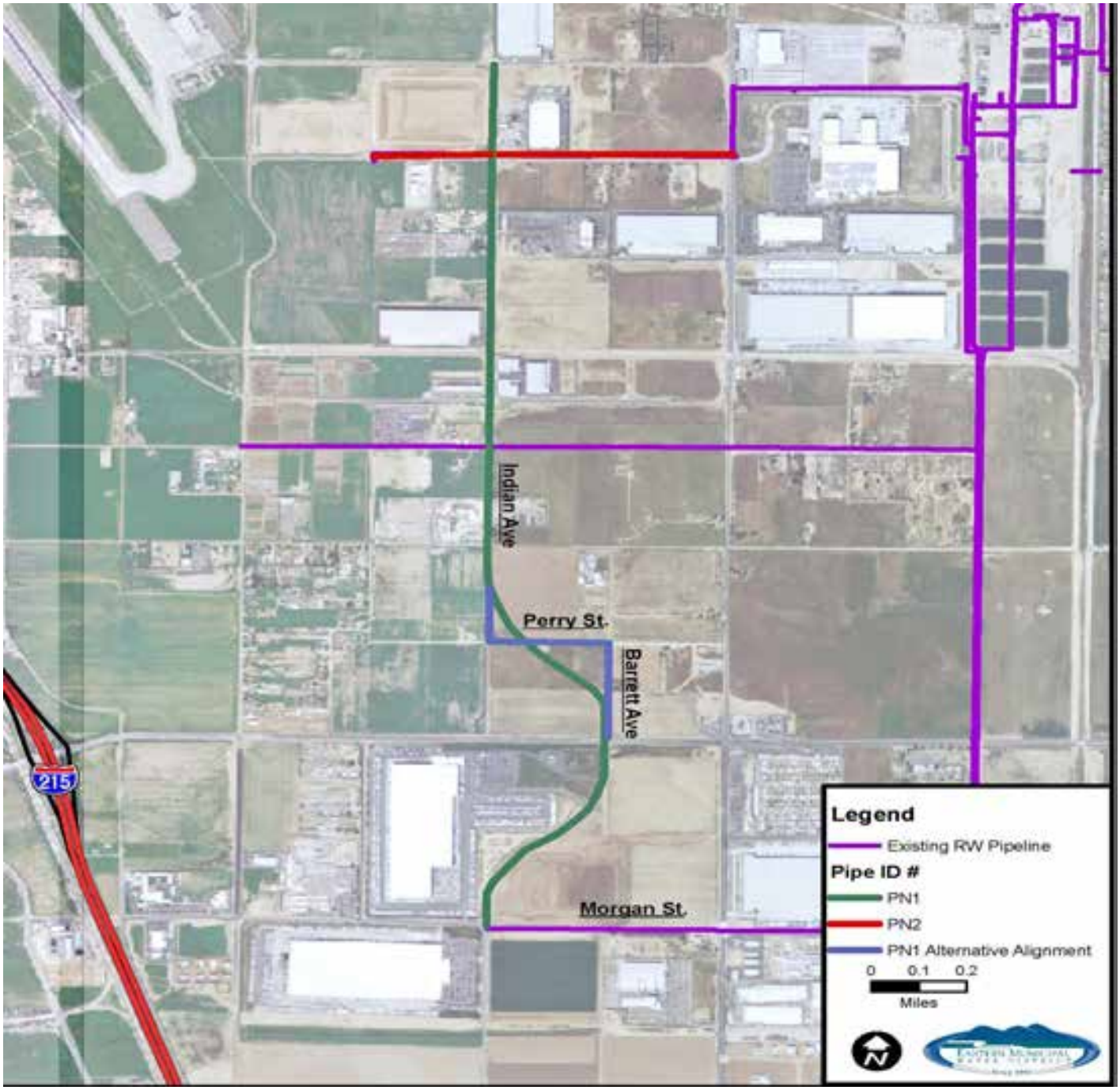

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Figure 2-5
Moreno Valley/Perris North Recycled Water Distribution Pipelines

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It also plans to install approximately 3,958 lineal feet of 12-inch diameter pipeline (PN-2) in Nandina Avenue from its intersection with Perris Boulevard to about 1,350 feet west of its intersection with Indian Avenue. A summary of pipeline locations, sizes and lengths is provided in Tables 2-4 and 2-5.

Table 2-4
Moreno Valley/Perris North Recycled Water Distribution Summary

Pipeline ID (Fig. 2-5)	Street Alignment	From Street	To Street	Size (inches)	Length (feet)
PN-1	Indian Avenue	Morgan Street	San Michele Road	12	12,820
PN-2	Nandina Avenue	Perris Boulevard	1,350' W of Indian Ave	12	3,958
				Totals	**16,778**

Note: General pipeline alignment shall be on the north or east side of the street at 7' from existing or future face of curb.

Table 2-5
Alternative Moreno Valley/Perris North Recycled Water Distribution Summary

Pipeline ID (Fig. 2-5)	Street Alignment	From Street	To Street	Size (inches)	Length (feet)
PN-1A	Indian/Perry/Barrett/Indian	Morgan Street	San Michele Road	12	13,870
PN-2	Nandina Avenue	Perris Boulevard	1,350' W of Indian Ave	12	3,958
				Totals	**17,828**

Note: General pipeline alignment shall be on the north or east side of the street at 7' from existing or future face of curb.

San Jacinto

As shown on Figure 2-6, the San Jacinto Recycled Water Distribution Pipeline Expansion Sub-project includes only one pipeline. It is proposed to install approximately 14,350 lineal feet of 12-inch diameter pipeline (SJ-1) in Cottonwood Avenue from Warren Road to 275 feet east of Pine Street. A summary of pipeline locations, sizes and lengths is provided in Table 2-6.

Table 2-6
San Jacinto Recycled Water Distribution Summary

Pipeline ID (Fig. 2-6)	Street Alignment	From Street	To Street	Size (inches)	Length (feet)
SJ-1	Cottonwood Avenue	Warren Road	275' E of Pine Street	12	14,350
				Totals	**14,350**

Note: General pipeline alignment shall be on the north or east side of the street at 7' from existing or future face of curb.

The proposed pipeline would cross The Metropolitan Water District of Southern California's (MWD) San Diego Pipeline Nos. 1 and 2 just east of Sanderson Avenue and the San Diego Aqueduct just west of Warren Road. The design of these crossings will be coordinated with MWD to ensure compliance with its requirements for crossings of MWD facilities.

Potential Funding Sources

There are at least three potential funding sources for this Project. They are: The Metropolitan Water District of Southern California's Local Resources Program; Water Recycling Funding Program (WRFP)

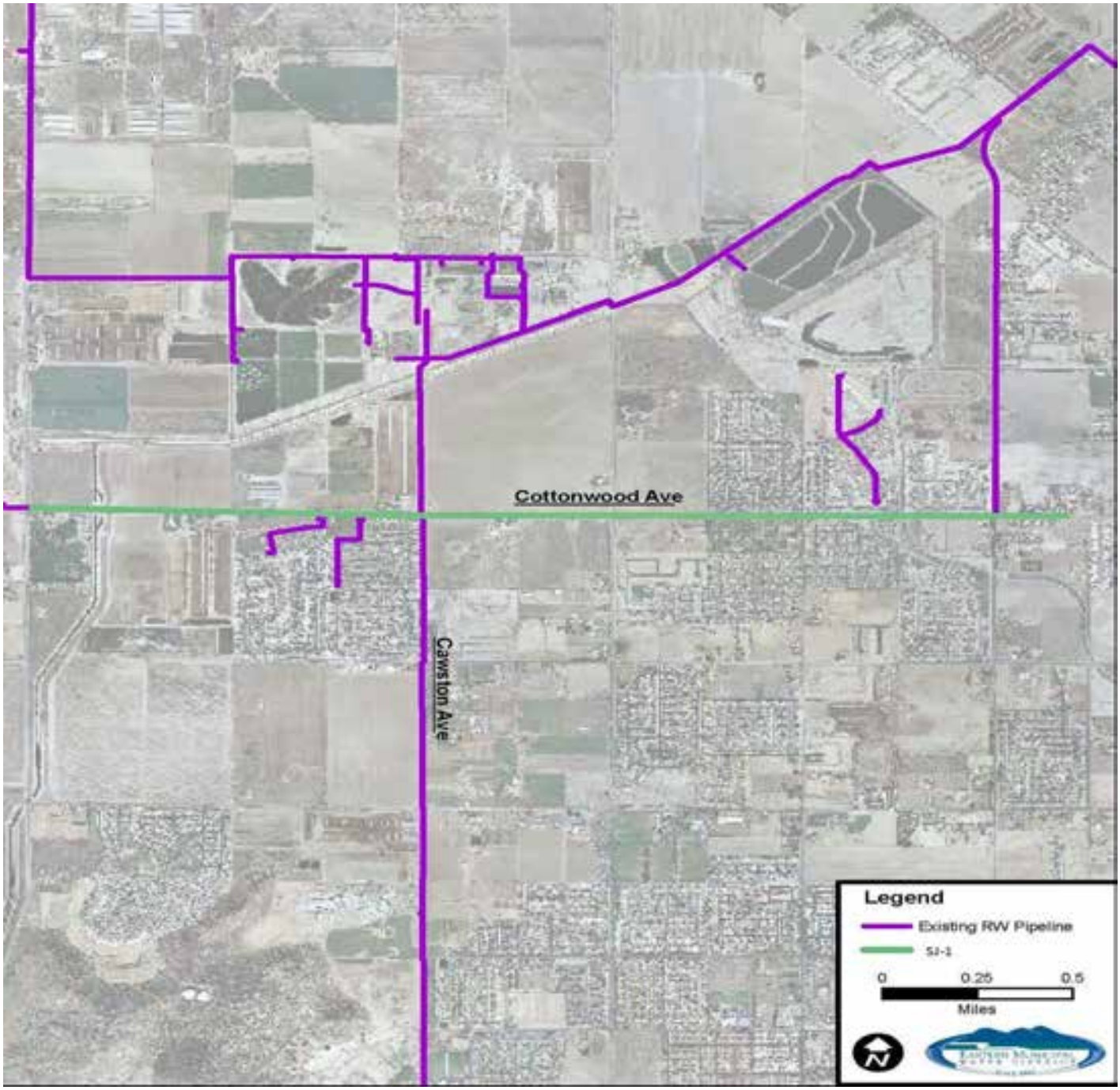

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Figure 2-6
San Jacinto Recycled Water Distribution Pipelines

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administered by the State Water Resources Control Board; and Title XV1, U.S. Bureau of Reclamation's Water Recycling and Reuse Program. These programs are briefly summarized in the following paragraphs.

Local Resources Program

The Local Resources Program administered by The Metropolitan Water District of Southern California provides funding for the development of water recycling and groundwater recovery supplies that replace an existing demand or prevent a new demand on Metropolitan's imported water supplies either through:

- Direct replacement of potable water, or
- Increased regional groundwater production.

Metropolitan seeks development of 174,000 afa of yield to meet a regional goal of 779,000 afa by year 2025.

Water Recycling Funding Program (WRFP)

The State Water Resources Control Board's Division of Financial Assistance is responsible for administering the Water Recycling Funding Program (WRFP). The mission of the WRFP is to promote the beneficial use of treated municipal wastewater (water recycling) in order to augment fresh water supplies in California by providing technical and financial assistance to agencies and other stakeholders in support of water recycling projects and research.

Funding for the construction of water recycling facilities is primarily funded from Proposition 50 and the State Revolving Fund (SRF) loan program. Construction grants will be limited to 25 percent of the eligible construction costs of a proposed project or $5 million whichever is less. A construction grant may be combined with any other source of funding the applicant may be eligible to obtain.

Title XVI – Reclamation's Water Recycling and Reuse Program

Title XVI of Public Law 102-575, as amended (Title XVI), provides authority for the U.S. Bureau of Reclamation's water recycling and reuse program, titled "Title XVI". The Title XVI program is focused on identifying and investigating opportunities to reclaim and reuse wastewaters and naturally impaired ground and surface water in the 17 Western States and Hawaii. Title XVI is budgeted for by Reclamation's regional offices and includes funding for planning studies and the construction of water recycling projects , on a project specific basis, in partnership with local governmental entities.

3 Aesthetics

Introduction

Both natural and artificial landscape features contribute to perceived visual images and the scenic attractiveness of a landscape. Scenic attractiveness is influenced by vegetation pattern, water characteristics, landforms, recreational features, and rural and urban features. Individuals respond differently to changes in the physical environment on their experiences of the environment prior to changes, the extent and nature of those changes, and the proximity and duration of their views. The aesthetic value of an area is therefore a subjective measure of the visual character and scenic quality.

Environmental Setting

From virtually any place in the Project area, there is a sweeping view of distant mountains and nearby hills. Rock outcroppings accent the hillsides and provide a distinct texture to the landscape. Other dominant features in the landscape include Lake Perris, Diamond Valley Lake, Colorado River Aqueduct, San Diego Aqueducts, San Jacinto River, Salt Creek, Highway 74, Highway 79, Ramona Expressway, Domenigoni Parkway and residential, commercial and industrial development. There are no designated State or County scenic highways within the Project area *(www.dot.ca.gov 2/24/10).* However, the Ramona Expressway is a County Eligible Scenic Highway.

Diamond Valley

Project facilities in the Diamond Valley area would be installed In streets owned and maintained by the City of Hemet: State Street, Chambers Street, Lyon Avenue and Pepper Tree Drive. As shown on Photo 3-1, State Street north of Simpson Road is a four-lane street with agricultural development on both sides of the street. There is also a large storm drain on the east side of the street. Further to the north, State Street is bordered on both sides by residential development.

As shown on Photo 3-2, Chambers Street to the east of State Street is a two lane street with residential development on the south and vacant land on the north. Also as shown on Photo 3-3, Chambers Street to the west of State Street is a two lane street with residential development on both sides of the street. Diamond Valley Middle School is also located on the south side of the street at its intersection with Gilbert Street. McSweeny Elementary School is also adjacent to the Middle School. West of the Middle School, the street narrows considerably. As shown on Figure 3-4, there is residential development on the north side of the street and agricultural lands on the south side.

Lyon Avenue between Chambers Street and Pepper Tree Drive is a one-way, one-lane street (Photo 3-5). However, it is proposed as a four-lane street as part of an approved Specific Plan. Pepper Tree Drive is a

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Photo 3-1
State Street Looking North from Simpson Road

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Photo 3-2
Chambers Street looking West from Buena Vista Street

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Photo 3-3
Chambers Street Looking West from Diamond Valley Middle School

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Photo 3-4
Chambers Street Looking West Towards Lyon Avenue

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two lane street that has residential development on the north and the clubhouse and parking lot for the Seven Hills Golf Course on the south.

Menifee

There are several subsets of the Menifee Recycled Water Distribution Pipeline Expansion Project. They are described from north to south in the following paragraphs.

A 12-inch diameter pipeline would be installed in Antelope Road from just north of Highway 74 to 775 feet north of its intersection with McLaughlin Road. As shown on Photo 3-6, Antelope Road in this area is within an industrial area.

It is also proposed to install a 12-inch diameter pipeline in Rouse Road from San Jacinto Road easterly to Junipero Road and south on Junipero Road to McCall Boulevard and east on McCall Boulevard to Menifee Road. As shown on Photo 3-7, Rouse Road is a dirt road surrounded by agricultural lands. As shown on Photo 3-8, Junipero Road south of Rouse Road is also a dirt road surrounded by agricultural land and a small riparian area until just north of the Boulder Ridge Middle School. At that point the road is a two-lane paved street to McCall Boulevard (Photo 3-9). As shown on Photo 3-10, Mc Call Boulevard east of Junipero Road is a two-lane road with a right turn deceleration lane.

EMWD also proposes to install a 12-inch diameter pipeline in Chambers Avenue from Sherman Road easterly to a point approximately 575 feet east of its intersection with Aspel Road near the Menifee Valley Medical Center. As shown on Photo 3-11, Chambers Avenue between Sherman Road and Chapman Lane is a paved two lane street with agricultural lands to the north and residential development to the south. However, as shown on Photo 3-12, between Chapman Lane and Aspel Road, Chambers Avenue is a dirt trail. There is also a drainage swale that meanders across this trail.

It is proposed to install an 18-inch diameter pipeline in Bradley Road from north of the Salt Creek Channel southerly to La Piedra Road. As shown on Photos 3-13 and 3-14, Bradley Road is a two lane road with multiple uses on either side [i.e., residential, open space, and school (Chester Morrison Elementary School)]. At La Piedra Road the pipeline is reduced in size from 18-inch diameter to 12-inch diameter and extends to approximately 100 feet north of Craig Avenue. That portion of the alignment is also bordered on both sides by residential development with some open space and the Paloma Valley High School at the southern end of the alignment. An 18-inch diameter pipeline is also proposed in La Piedra Road east of Bradley Road. As shown in Photo 3-15 that two-lane street is also bordered on both sides by residential development to just beyond Cleary Road. The paved road ends at that location and becomes a dirt road with open space on both sides. Another 12-inch diameter pipeline would be installed in La Piedra Road west of Bradley Road. That two-lane street is also bordered on both sides by residential development. A short section (290 feet) of 8 inch diameter pipeline would also be installed in School Park Drive east of Bradley Road. That section has the school to the north and residential development to the south as shown on Photo 3-16.

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Photo 3-5
Lyon Avenue Looking South from Pepper Tree Drive

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Photo 3-6
Antelope Road Looking South from Ethanac Road

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Photo 3-7
Rouse Road Looking West from Junipero Road

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Photo 3-8
Junipero Road Looking South from Rouse Road

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Photo 3-9
Junipero Road Looking North from McCall Boulevard

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Photo 3-10
McCall Boulevard Looking East from Junipero Road

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Photo 3-11
Chambers Avenue Looking East from Sherman Road

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Photo 3-12
Chambers Avenue Looking West from Aspel Road

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Photo 3-13
Bradley Road Looking South from Salt Creek Channel

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Photo 3-14
Bradley Road Looking North from School Park Drive

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Photo 3-15
La Piedra Road Looking West from Cleary Street

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Photo 3-16
School Park Drive Looking West from Chester Morrison Way

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It is also proposed to install an 8-inch diameter pipeline in Antelope Road east of Highway 215 in front of the Mount San Jacinto College Menifee Valley Campus (Photo 3-17). As shown on Photo 3-17, that area has the college on the east side and Highway 215 right-of-way on the west side. A jack and bore crossing under Highway 215 would also occur near the Antelope Road and La Piedra Road intersection.

French Valley

Proposed project facilities in French Valley would be in streets owned and maintained by the County of Riverside (i.e., Benton Road, Pourroy Road, Thompson Road, Cady Road and Maddalena Road).

As shown on Photos 3-18 and 3-19, Benton Road is a four-lane divided street with residential development both on the north and south sides of the street. There is also a community park on the south side of Benton Road at Cady Road. A short section of 8-inch diameter pipeline would also be installed in Cady Road to the French Valley Elementary School property. As shown on Photo 3-20, the community park and school are on the east side of Cady Road and residential development is on the west side of Cady Road. Another short section of 8-inch diameter pipeline would be installed in Maddalena Road south of Benton Road. This is also a residential street.

It is also proposed to install a 12-inch diameter pipeline in Pourroy Road from Benton Road northerly to approximately 375 feet south of Winchester Road (Highway 79). As shown on Photos 3-21 through 3-23, land development on either side of Pourroy Road is mixed use (e.g., residential, parks, schools, etc.). There would be a tee installed in this pipeline at Thompson Road and an 8-inch diameter line installed from the tee to approximately 300 feet east of Joltaire Way in Thompson Road. As shown on Photo 3-24, Thompson Road is also a residential street with homes on both sides of the street.

Moreno Valley/Perris North

EMWD proposes to install two recycled water pipelines in the Moreno Valley/Perris North Recycled Water Distribution Pipeline Expansion Sub-Project area. A 12-inch diameter pipeline would be installed in Nandina Avenue between a point approximately 1,350 feet west of Indian Avenue to Perris Boulevard. As shown on Photo 3-25, this area is industrial with some vacant land. A 12-inch diameter pipeline would also be installed in Indian Avenue from San Michele Road southerly to Morgan Street. As shown on Photos 3-26 and 3-27, this is also an industrial area with some vacant land. As previously shown on Figure 2-6, an alternative alignment within Perry Street and Barrett Avenue is also proposed. Lands surrounding this alternative alignment are presently agricultural. The northern portion of this sub-project area is within the City of Moreno Valley and the southern portion is within the City of Perris.

San Jacinto

EMWD proposes to install one recycled water pipeline in the San Jacinto Recycled Water Distribution Pipeline Expansion Sub-Project area. A 12-inch diameter pipeline would be installed in Cottonwood Avenue between Warren Road and a point approximately 275 feet east of Pine Street. Cottonwood

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Photo 3-17
Antelope Road in Front of Mount San Jacinto College

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Photo 3-18
Benton Road Looking West from Maddalena Road

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Photo 3-19
Benton Road Looking East at Cady Road

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Photo 3-20
Cady Road Looking South from Benton Road

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Photo 3-21
Pourroy Road Looking North from Benton Road

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Photo 3-22
Pourroy Road Looking North from Jubilee Road

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Photo 3-23
Pourroy Road Looking North from Skyview Road

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Photo 3-24
Thompson Road Looking West from Pourroy Road

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Photo 3-25
Nandina Avenue Looking East to Indian Avenue

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Photo 3-26
Indian Avenue Looking South from Nandina Avenue

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Photo 3-27
Indian Avenue Looking South at Oleander Avenue

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Avenue is within the City of San Jacinto. As shown on Photos 3-28 and 3-29, development along Cottonwood Avenue is mixed use (i.e., residential, commercial and agricultural).

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Photo 3-28
Cottonwood Avenue Looking West from Lyon Avenue

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Photo 3-29
Cottonwood Avenue Looking West from Sanderson Avenue

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Environmental Impacts Analysis

Threshold Criteria

The following thresholds are based on Appendix G of the 2009 State CEQA Guidelines. According to the State CEQA Guidelines, implementation of the proposed Project could result in potentially significant impacts if the Project would do any of the following:

- Have a substantial adverse effect on a scenic vista.
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.
- Substantially degrade the existing visual character or quality of the site and its surroundings.
- Create a new source of light and glare that would adversely affect day or nighttime views in the area.

Environmental Analysis

Potential Impact: Have a substantial adverse effect on a scenic vista.

All Project facilities would be underground with the exception of air release valves, etc. In addition, there are no scenic vistas in the immediate Project area; therefore, there are no anticipated impacts and no mitigation is required.

Significance of Impact:

No Impact.

Mitigation Measure:

None required.

Potential Impact: Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.

Neither Caltrans nor the applicable general plans have designated scenic highways or view corridors within the Project area; therefore, no impacts are anticipated and no mitigation is required.

Significance of Impact:

No Impact.

Mitigation Measure:

None required.

Potential Impact: Substantially degrade the existing visual character or quality of the site and its surroundings.

The proposed recycled water pipelines would be underground and not visible to the public with the exception of air valves, and other appurtenances. Therefore, no impacts are anticipated and no mitigation is required.

During construction, there would be equipment and workers along the pipeline alignments. This would be considered a less-than-significant aesthetic impact and no mitigation is required.

Significance of Impact:

No impact.

Mitigation Measures:

None required.

Potential Impact: Create a new source of light and glare that would adversely affect day or nighttime views in the area.

The Project would not include security lighting or other sources of light and glare as all facilities would be underground with the exception of air valves and other appurtenances.

Significance of Impact:

No impact.

Mitigation Measure:

None required.

References

California Department of Transportation. 2010. List of Scenic Highways in California. www.dot.ca.gov (2/12/10).

City of Hemet. 2009. *Proposed Land Use Plan and Circulation System*. March.

City of Moreno Valley. 2009. *General Plan Land Use.* March 9.

City of Perris. 2009. *City of Perris General Plan.* February 19.

City of San Jacinto. 2009. *General Plan Land Use.* October.

Riverside County Board of Supervisors, *Riverside General Plan*, adopted October 7, 2003.

Riverside County Board of Supervisors, *Southwest Area Plan,* adopted on October 7, 2003.

Riverside County Board of Supervisors, *Sun City/Menifee Area Plan,* adopted on October 7, 2003.

State of California. 2009. *Title 14, California Code of Regulations, Chapter 3, Guidelines for Implementation of the California Environmental Quality Act.* December 30.

4 Agricultural and Forest Resources

Environmental Setting

Agricultural Resources

There are four classifications of agricultural lands as established by State and federal agencies: Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance. These are briefly described below *(County of Riverside, October 7, 2003)*:

Prime Farmland

Prime Farmland is land best suited for producing food, feed, forage, fiber and oil seed crops, and is available for these uses: cropland, pastureland, range land, forest land or other land, but not urban land or water. It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed (including water management) according to modern farming methods.

Farmland of Statewide Importance

Farmland of Statewide Importance is land other than Prime Farmland that has a good combination of physical and biological characteristics for producing food, feed, forage, fiber and oil seed crops, or is available for these uses (the land could be cropland, pastureland, range land, forest land, or other land, but not urban land or water).

Unique Farmland

Unique Farmland is land other than Prime Farmland and Farmland of Statewide Importance that is currently being used for the production of specific high value food and fiber crops. It has the special combination of soil quality, location, growing season and moisture supply needed to produce a sustained high quality of a specific crop when treated and managed according to modern farming methods. Examples of such economically important crops are citrus, olives and avocados.

Farmland of Local Importance

These farmlands are not covered by the above categories but are of locally significant economic importance. These include the following:

- Lands with soils that would be classified as Prime Farmland or Farmland of Statewide Importance but lack available irrigation water.
- Lands planted in 1980 or 1981 in dry land grain crops such as barley, oats and wheat.

- Lands providing major crops for Riverside County but that are not listed as Unique Farmland crops. Such crops are permanent pasture (irrigated), summer squash, okra, eggplant, radishes and watermelon.
- Dairy lands including corrals, pasture, milking facilities, hay and manure storage areas if accompanied with permanent pasture or hay land of 10 acres of more.
- Lands identified by the County with Agricultural land use designations or contracts.
- Lands planted with jojoba that are under cultivation and are of producing age.

There are some agricultural lands within the greater project area but none that would be impacted by implementation of the proposed Project as all facilities are within street rights-of-way.

Forest Resources

According to §12220(g) of the California Public Resources Code, forest land is land that can support 10 percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits.

Timber is further defined in §51104(e) of the Government Code. Timber means trees of any species maintained for eventual harvest for forest products purposes, whether planted or of natural growth, standing or down, on privately or publicly owned land, including Christmas trees, but does not mean nursery stock. Timberland is also defined in §51104(f) of the Government Code. Timberland means privately owned land, or land acquired for state forest purposes, which is devoted to and used for growing and harvesting timber, or for growing and harvesting timber and compatible uses, and which is capable of growing an average annual volume of wood fiber or at least 15 cubic feet per acre. Timberland production zone or TPZ is defined in §51104(g) of the Government Code. TPZ means an area which has been zoned pursuant to Section 51112 or 51113 and is devoted to and used for growing and harvesting timber and compatible uses, as defined in subdivision (h). With respect to the general plans of cities and counties, “timberland preserve land” means “timberland production zone”.

A compatible use as defined in §51104(h) of the Government Code means any use which does not significantly detract from the use of the property for, or inhibit, growing and harvesting timber, and shall include, but not be limited to, any of the following, unless in a specific instance such a use would be contrary to the preceding definition of compatible use:

1) Management for watershed.
2) Management for fish and wildlife habitat or hunting and fishing.
3) A use integrally related to the growing, harvesting and processing of forest products, including but not limited to roads, log landings, and log storage areas.

4) The erection, construction, alteration, or maintenance of gas, electric, water, or communication transmission facilities.
5) Grazing.
6) A residence or other structure necessary for the management of land zoned as timberland production.

There are no forest lands or timberlands in the immediate project area.

Data used to prepare this section were taken from several sources. Full bibliographic entries are provided at the end of this chapter.

Environmental Impact Analysis

Threshold Criteria

The following thresholds of significance are based on Appendix G of the 2009 State CEQA Guidelines. For purposes of this EA/DEIR, implementation of the proposed Project may have a significant adverse impact on agricultural resources if it would:

- Convert Prime 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.
- Conflict with existing zoning for agricultural use, or a Williamson Act contract.
- 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)).
- Result in the loss of forest land or conversion of forest land to non-forest use.
- Involve other changes in the existing environment that, 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.

Environmental Analysis

Potential Impact: Convert Prime 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.

There is no Farmland in the immediate Project area that would be impacted by implementation of the proposed Project. Therefore, no impacts are anticipated and no mitigation is required.

Significance of Impact:

No impact.

Mitigation Measure:

None required.

Potential Impact: Conflict with existing zoning for agricultural use, or a Williamson Act contract.

The proposed pipelines would not be within an agricultural preserve or Williamson Act contract; therefore, no impacts are anticipated and no mitigation is required.

Significance of Impact:

No impact.

Mitigation Measure:

None required.

Potential Impact: 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)).

As shown above, there are no forest or timberland resources in the greater Project area; therefore, no impacts are anticipated and no mitigation is required.

Significance of Impact:

No impact.

Mitigation Measure:

None required.

Potential Impact: Result in the loss of forest land or conversion of forest land to non-forest use.

The Project area does not contain forest land; therefore, no impacts are anticipated and no mitigation is required.

Significance of Impact:

No impact.

Mitigation Measure:

None required.

Potential Impact: Involve other changes in the existing environment that, 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.

As stated above, the immediate Project area does not contain any Farmland or forest land; therefore, no impacts are anticipated and no mitigation is required.

Significance of Impact:

No impact.

Mitigation Measure:

None required.

References

City of Hemet. 2009. *Proposed Land Use Plan and Circulation System*. March.

City of Moreno Valley. 2009. *General Plan Land Use.* March 9.

City of Perris. 2009. *City of Perris General Plan.* February 19.

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State of California. 2009. *Title 14, California Code of Regulations, Chapter 3, Guidelines for Implementation of the California Environmental Quality Act.* December 30.

State of California. 2002. *Government Code.*

State of California. *Public Resources Code.*

5 Air Quality

Environmental Setting

Climate

The climate of Southern California is primarily influenced by topography and the position and the strength of the East Pacific High Pressure Area that influences wind flow, rainfall patterns and ocean currents. The project area's proximity to the Pacific Ocean combined with varying topography and winds greatly influence temperatures within the area. As shown on Figure 5-1 the average maximum temperature is about 99ºF in July and August and the average minimum temperature is about 37ºF in December (www.dri.edu 9/24/09).

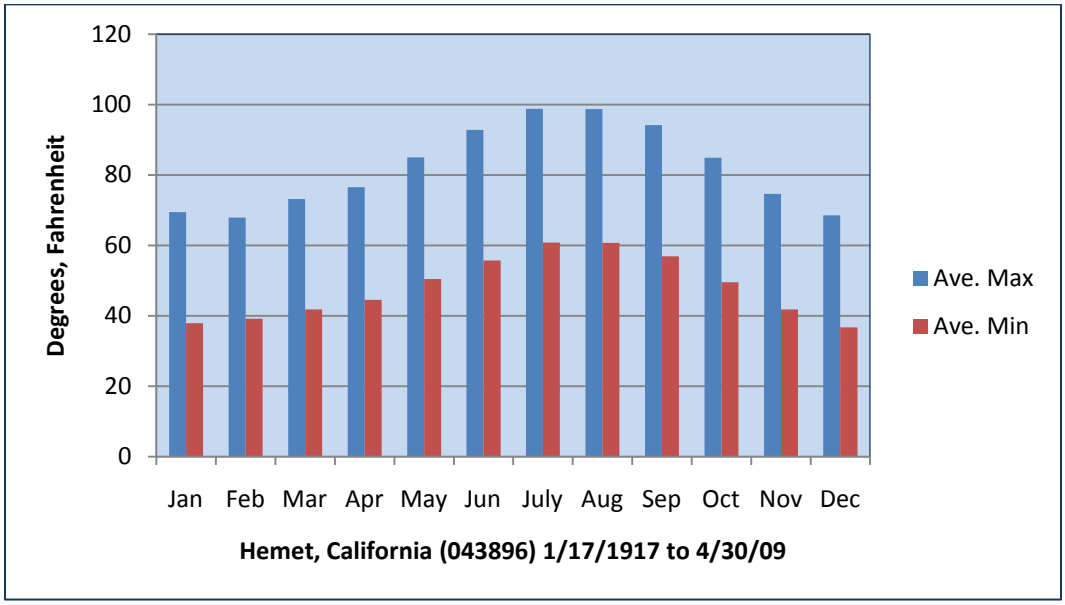

Figure 5-1 Average Temperatures at Hemet, California (043896)

Generally, rainfall is low in the winter due to this high pressure system. As shown on Figure 5-2, about 85 percent of the precipitation falls from November through April with maximums occurring usually in January. The annual precipitation averages about 11.3 inches (www.dri.edu 9/24/09).

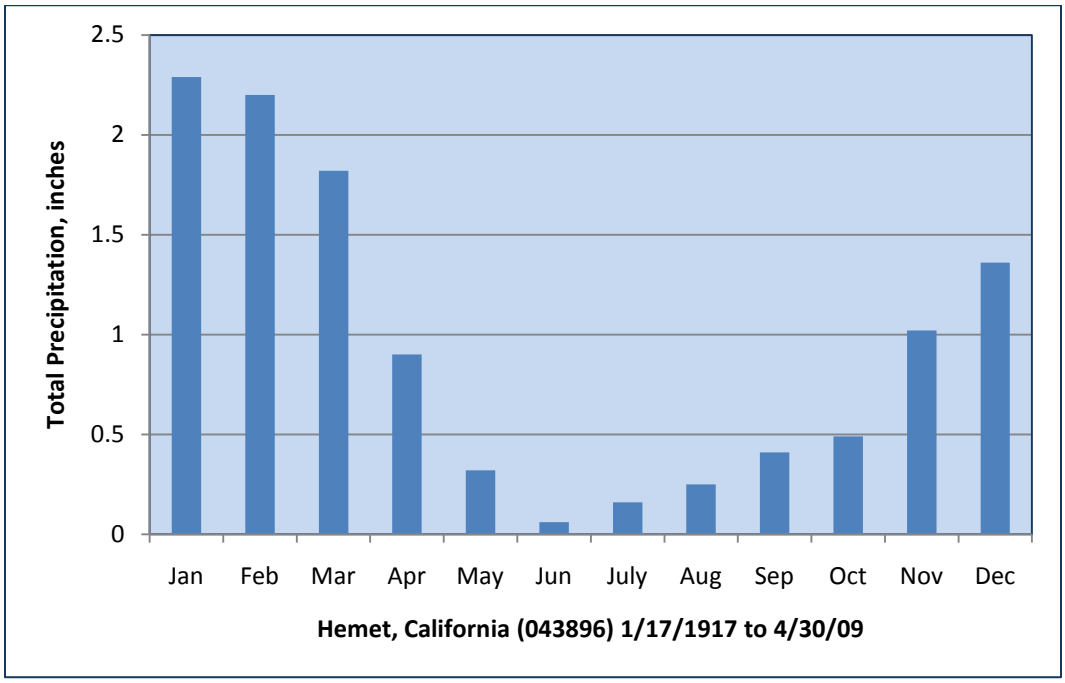

Figure 5-2 Average Precipitation at Hemet, California (043896)

Regional Air Quality

Ambient air quality is affected by both the rate and location of pollutant emissions and by meteorological conditions that influence the local and regional dispersal of pollutants. Atmospheric conditions such as wind speed and direction and air temperature gradients combined with local topography provide the link between air pollutant emissions and air quality.

The proposed Project is within the South Coast Air Basin (SCAB), which incorporates approximately 12,000 square miles, consisting of four counties (i.e., San Bernardino, Riverside, Los Angeles, and Orange) including some portions of what used to be the Southeast Desert Air Basin that includes the Beaumont-Banning area. Nearly half of California's population, which generates about one-third of the State's total criteria pollutant emissions, lives within the SCAB.

Planning for the attainment and maintenance of both federal and State air quality standards in the Project area is the responsibility of the South Coast Air Quality Management District (SCAQMD).

Air Pollutants

Pollutants regulated by the State and federal Clean Air Acts fall within three categories:

- criteria air pollutants
- toxic air contaminants, and
- global warming and ozone depleting gases.

Pollutants in each of these categories are monitored and regulated differently. Criteria air pollutants are measured by sampling concentrations in the air; toxic air contaminants are measured at the source and in the general atmosphere, and global warming and ozone-depleting gases are not monitored but are subject to federal and regional policies that call for their reduction and eventual phaseout *(www.aqmd.gov, 10/18/06).* California's landmark global warming legislation, AB 32, requires that the State's greenhouse gas emissions be reduced to 1990 levels by 2020. Emission trading is being considered for achieving the requirements of AB 32 *(www.aqmd.gov, 4/21/07).*

Criteria Air Pollutants

Criteria air pollutants are defined as those pollutants for which the federal and state governments have established air quality standards for outdoor or ambient concentrations to protect public health. Those standards have been set at levels to protect the human health with an adequate margin of safety.

The following paragraphs describe the source and health effects of the criteria pollutants. In addition, Table 5-1 lists the primary emission sources of the criteria pollutants and some of the harmful effects of the pollutants.

Table 5-1
Primary Sources and Effects of Criteria Pollutants

Pollutant	Source	Primary Health Effects
Lead (Pb)	Contaminated soil	Impairment of blood function and nerve construction. Behavioral and hearing problems in children.
Sulfur Dioxide (SO_2)	Combustion of sulfur-containing fossil fuels. Smelting of sulfur-bearing metal ores. Industrial processes.	Plant injury. Reduced visibility. Deterioration of metals, textiles, leather, finishes, coatings, etc. Irritation of eyes. Reduced lung function. Aggravation of respiratory diseases (asthma, emphysema).
Carbon Monoxide (CO)	Incomplete combustion of fuels and other carbon-containing substances, such as motor vehicle exhaust. Natural events, such as decomposition of organic matter.	Plant injury. Reduced visibility. Deterioration of metals, textiles, leather, finishes, coatings, etc. Irritation of eyes. Reduced lung function. Aggravation of respiratory diseases (asthma, emphysema).
Nitrogen Dioxide (NO_2)	Motor vehicle exhaust. High temperature stationary combustion. Atmospheric reactions.	Reduced plant growth. Reduced visibility. Aggravation of respiratory illness. Formation of acid rain.
Ozone (O_3)	Atmospheric reaction of organic gases with nitrogen oxides in sunlight.	Plant leaf injury. Irritation of eyes. Aggravation of respiratory and

Pollutant	Source	Primary Health Effects
		cardiovascular diseases. Impairment of cardiopulmonary function.
Respirable Particulate Matter (PM_{10})	Secondary combustion of solid fuels. Construction activities. Industrial processes. Atmospheric chemical reactions.	Soiling. Reduced visibility. Aggravation of the effects of gaseous pollutants. Increased cough and chest discomfort. Reduced lung function. Aggravation of respiratory and cardio-respiratory diseases.
Fine Particulate Matter ($PM_{2.5}$)	Secondary combustion of solid fuels. Construction activities. Industrial processes. Atmospheric chemical reactions.	Soiling. Reduced visibility. Aggravation of the effects of gaseous pollutants. Increased cough and chest discomfort. Reduced lung function. Aggravation of respiratory and cardio-respiratory diseases.

Source: SCAQMD, 1999

Lead

Lead (Pb) in the atmosphere occurs as particulate matter. The combustion of leaded gasoline was the primary source of lead emissions. Other sources of lead include the manufacturing of batteries, paint, ink, ceramics, and ammunition and secondary lead smelters. With the phase-out of leaded gasoline, secondary lead smelters and battery recycling and manufacturing facilities are becoming lead emission sources of greater concern.

Prolonged exposure to lead poses a serious threat to human health. Health effects associated with exposure to lead include gastrointestinal disturbances, anemia, kidney disease, and in severe cases, neuromuscular dysfunction. Of particular concern are low-level lead exposures during infancy and childhood. Such exposures are associated with decrements in neurobehavioral performance (including IQ performance, psychomotor performance and reaction time) and growth. Lead is classified as a probable human carcinogen with an EPA weight-of-evidence classification of B2.

Sulfur Dioxide

Sulfur dioxide (SO_2) is a colorless gas with a pungent, irritating odor. Sulfur dioxide is created by the combustion of sulfur containing fuels. This substance is known to oxidize to sulfur trioxide, which combines with moisture in the atmosphere to form a sulfuric acid mist. Sulfur dioxide damages and irritates lung tissue and accelerates corrosion of materials.

Carbon Monoxide

The automobile and other types of motor vehicles are the primary source of carbon monoxide (CO). This gas is colorless and odorless which adds to its danger. In high concentrations, carbon monoxide can cause physiological and pathological changes, and ultimately death, by incapacitating the red blood cells and interfering with their ability to carry oxygen to body tissues.

Nitrogen Dioxide

Nitrogen dioxide (NO_2) is a by-product of fuel combustion. The principal form of nitrogen oxide produced by combustion is nitric oxide (NO), but nitric oxide reacts quickly to form nitrogen dioxide, creating the mixture of nitric oxide and nitrogen dioxide commonly called NO_x. Nitrogen dioxide acts as an acute irritant and, in equal concentrations, is more injurious than nitric oxide. At atmospheric concentrations, however, nitrogen dioxide is only potentially irritating. There is some indication of a relationship between nitrogen dioxide and chronic pulmonary fibrosis. Some increase in bronchitis in children (two to three years old) has been observed at concentrations below 0.3 ppm. Nitrogen dioxide absorbs blue light; the result is a brownish-red cast to the atmosphere and reduced visibility. Nitrogen dioxide also contributes to the formation of suspended particulate matter.

Ozone

Ozone (O_3) is one of a number of substances called photochemical oxidants that are formed when reactive organic compounds and nitrogen oxides, both byproducts of the internal combustion engine, react in the presence of ultraviolet sunlight. Ozone may pose its worst health threat to those who already suffer from respiratory diseases. However, ozone also hurts healthy people. In the past, those effects were thought to be limited to more difficult breathing during work and exercise. However, research has shown that children residing in areas of high ozone concentrations experience a loss in lung function.

Respirable Particulate Matter Less Than 10 Microns in Diameter (PM_{10})

Respirable particulate matter (PM_{10}) consists of extremely small suspended particles or droplets 10 microns or smaller in diameter that can lodge in the lungs contributing to respiratory problems. PM_{10} arises from such sources as road dust, diesel soot, combustion products, abrasion of tires and brakes, construction operations, and windstorms. It is also formed in the atmosphere from nitrogen dioxide and sulfur dioxide reactions with ammonia. PM_{10} scatters light and significantly reduces visibility.

Particulates pose a serious health hazard, alone or in combination with other pollutants. More than half of the smallest particles inhaled will be deposited in the lungs and can cause permanent lung damage. Fine particulates can also have a damaging effect on health by interfering with the body's mechanism for clearing the respiratory tract or by acting as a carrier of an absorbed toxic substance.

Fine Particulate Matter ($PM_{2.5}$)

Fine particulate matter ($PM_{2.5}$) is defined as particulate matter with a diameter less than 2.5 microns and is a subset of PM_{10}. It consists mostly of products from the reaction of NO_x and SO_2 with ammonia, secondary organics, and finer dust particles.

Toxic Air Contaminants

Toxic air pollutants (TAPs) are those pollutants that are known or suspected of causing cancer or other serious health effects. Some TAPs are immediately dangerous to human health even in small quantities; some TAPs cause health problems if the exposure extends over a longer period of time. The degree to which a TAP affects a person's health depends on many factors, including the quantity of the pollutant the person is exposed to, the duration and frequency of exposures, the toxicity of the chemical, and the person's state of health and susceptibility.

Scientists estimate that millions of tons of TAPs are released into the air each year. Some air toxics are released from natural sources such as volcanic eruptions and forest fires. However, most originate from manmade sources, including both mobile sources (e.g., cars, trucks and buses) and stationary sources (e.g., factories, refineries, power plants and small businesses). In addition, many routine activities around the home, such as using gas-powered lawn mowers and tools, or using volatile paints and solvents release TAPs into the atmosphere.

The list of TAPs in the Clean Air Act is a long one (275 names) and includes some familiar names such as benzene. Examples of other TAPs include percholoroethylene, methylene chlorine, toluene, dioxin, and metals such as mercury, chromium and lead compounds.

Greenhouse Gases

The following discussion on greenhouse gases is excerpted from SCAQMD's *Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold* dated October 2008.

Gases that trap heat in the atmosphere are often called greenhouse gases. The Kyoto Protocol, adopted in December 1997, is an agreement under which industrialized countries will reduce their collective emissions of greenhouse gases by specified percentages, depending upon the country, compared to 1990 levels. The goal is lower overall emissions of six greenhouse gases – carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons, averaged over the period of 2008-2012.

Similarly, AB 32, defines GHG's as including the following: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (NO_2), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride [Health and Safety Code, §38505(g)]. The most common GHG that results from human activity is carbon dioxide, followed by methane and nitrous oxide.

Some greenhouse gases such as carbon dioxide occur naturally and are emitted to the atmosphere through natural processes and human activities. Other greenhouse gases (e.g., fluorinated gases) are created and emitted solely through human activities. The principal greenhouse gases that enter the atmosphere because of human activities are:

- **Carbon Dioxide (CO_2):** Carbon dioxide enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., manufacture of cement). Carbon dioxide is also removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.

- **Methane (CH_4):** Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.

- **Nitrous Oxides (NO_2):** Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.

- **Fluorinated Gases:** Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful greenhouse gases that are emitted from a variety of industrial processes. Fluorinated gases are sometimes uses as substitutes for ozone-depleting substances (i.e., CFCs, HCFCs, and halons). Fluorinated gases are typically emitted in smaller quantities, but because they are potent greenhouse gases, they are sometimes referred to as high global warming potential gases (high GWP gases).

    - Hydrofluorocarbons are manmade chemicals that have historically replaced chlorofluorocarbons used in refrigeration and semi-conductor manufacturing.

    - Perfluorocarbons are manmade chemicals that are by-products of aluminum smelting and uranium enrichment.

    - Sulfur hexafluoride is a manmade chemical that is largely used in heavy industry to insulate high voltage equipment and to assist in the manufacturing of cable cooling systems.

GWP is a measure of how much a given mass of greenhouse gas is estimated to contribute to global warming. It is a relative scale that compares the gas in question to the same mass of carbon dioxide (whose GWP by definition is 1). A GWP is calculated over a specific time interval and the value of this must be stated whenever a GWP is quoted or else the value is meaningless. A substance's GWP depends on the time span over which the potential is calculated. A gas which is quickly removed from the atmosphere may initially have a large effect but for longer time periods as it has been removed becomes less important. For the purposes of a CEQA analysis, especially an analysis of operating emissions, the maximum GWP is typically used, regardless of the actual atmospheric lifetime. This approach simplifies

the analysis and provides a very conservative analysis, especially for the fluorinated gases. The GWP of the six Kyoto GHGs is shown in Table 5-2 [U.S. EPA (www.epa.gov)].

Table 5-2
Global Warming Potential of Kyoto GHGs

Gas	GWP
Carbon Dioxide (CO_2)	1
Methane (CH_4)	21
Nitrous Oxide (NO_2)	310
HFC-23 (Hydrofluorocarbons)	11,700
HFC-32	650
HFC-125	2,800
HFC-134a	1,300
HFC-143a	3,800
HFC-152a	140
HFC-227ea	2,900
HFC-236fa	6,300
HFC-4310mee	1,300
CF_4 (Perfluorocarbons)	6,500
C_2F_6	9,200
C_4F_{10}	7,000
C_6F_{14}	7,400
Sulfurhexafluoride (SF_6)	23,900

Ambient Air Quality Standards

The current ambient air quality standards are provided in Table 5-3 [www.arb.ca.gov (1/27/10)].

Table 5-3
National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California	Federal	
		Concentration	Primary	Secondary
Ozone (O_3)	1 hour	0.09 ppm (180 µg/m^3)	--	Same as primary standard.
	8 hour	0.070 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)	
Respirable Particulate Matter (PM_{10})	24 hour	50 µg/m^3	150 µg/m^3	Same as primary standard.
	Annual Arithmetic Mean	20 µg/m^3	--	
Fine Particulate Matter ($PM_{2.5}$)	24 hour	No separate standard.	35 µg/m^3	Same as primary standard.
	Annual Arithmetic Mean	12 µg/m^3	15 µg/m^3	
Carbon Monoxide (CO)	8 hour	9.0 ppm (10 mg/m^3)	9.0 ppm (10mg/m^3)	None.
	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	
Nitrogen Dioxide (NO_2)*	Annual Arithmetic Mean	0.030 ppm (56 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as primary standard.
	1 hour	0.18 ppm (338 µg/m^3)	0.100 ppm	0.053 ppm (100 µg/m^3)
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	---	0.030 ppm (80 µg/m^3)	---
	24 hour	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)	---
	3 hour	---	---	0.5 ppm (1300 µg/m^3)
	1 hour	0.25 ppm (655 µg/m^3)	---	---

Pollutant	Averaging Time	California	Federal	
		Concentration	Primary	Secondary
Lead	30 day Average	1.5 µg/m^3	---	---
	Calendar Quarter	---	1.5 µg/m^3	Same as primary standard.
	Rolling 3-month Average	--	0.15 µg/m^3	
Visibility Reducing Particles	8 hour	Extinction coefficient of 0.23 kilometer—visibility of 10 miles or more due to particles when relative humidity is less than 70 percent.	No Federal Standards.	
Sulfates	24 hour	25 µg/m^3		
Hydrogen Sulfide	1 hour	0.03 ppm (42 µg/m^3)		
Vinyl Chloride	24 hour	0.01 ppm (26 µg/m^3)		

Ambient Air Quality Data

The California Air Resources Board (ARB) provides ambient air quality data for most air basins in the State. A summary of the data available for the greater project area is provided in Tables 5-4, 5-5.

Table 5-4
Ozone Trends Summary
Perris

Year	Days > Standard				1-hr Observations			8-hr Averages				Year Coverage
	State		National		Max	State	Nat'l	State		National		
	1-hr	8-hr	*1-hr*	'08 8-hr		D.V.[1]	D.V.[2]	Max	D.V.[1]	Max	'08 D.V.[2]	
2008	65	94	*4*	77	0.142	0.14	*0.142*	0.115	0.123	0.144	0.107	99
2007	66	88	*4*	73	0.138	0.14	*0.140*	0.117	0.117	0.116	0.100	99
2006	77	98	*12*	83	0.169	0.14	*0.140*	0.123	0.117	0.122	0.097	99
2005	11	25	*1*	16	0.126	0.13	*0.135*	0.104	0.122	0.103	0.098	98
2004	36	59	*2*	44	0.128	0.14	*0.136*	0.104	0.122	0.104	0.106	99
2003	67	82	*7*	72	0.155	0.15	*0.149*	0.122	0.130	0.121	0.115	100
2002	59	92	*4*	73	0.147	0.15	*0.149*	0.117	0.130	0.117	0.113	100
2001	73	102	*19*	83	0.152	0.15	*0.149*	0.136	0.136	0.135	0.107	100
2000	65	90	*15*	71	0.164	0.16	*0.147*	0.127	0.129	0.126	0.104	100
1999	10	30	***0***	17	0.112	0.14	*0.137*	0.098	0.122	0.097	0.102	100

Notes: All concentrations expressed in parts per million (ppm).
The national 1-hr ozone standard was revoked in June 2005 and is no longer in effect. Statistics related to the revoked Standard are shown in *italics* or *italics*.
State exceedances shown in green. National exceedances shown in orange.
[1] D.V. = State designation value.
[2] D.V. = National design value.

Source: Air Resources Board 2010 (arb.ca.gov 2/15/10)

Table 5-5
PM_{10} Trends Summary
Perris

Year	Est. Days > Std.		Annual Average		3-yr Average		High 24-hr Average		Year Coverage
	Nat'l	State	*Nat'l*	State	*Nat'l*	State	Nat'l	State	
2008	*	*	*29.6*	*	*47*	*	85.0	**87.0**	81
2007	*	*	***65.4***	*	*50*	**37**	**1212.0**	**1155.0**	82
2006	0.0	*	*44.9*	*	*42*	**37**	125.0	**119.0**	84
2005	0.0	**110.1**	*39.1*	**37.1**	*41*	**37**	80.0	**75.0**	99
2004	0.0	*	*41.4*	*	*43*	**43**	83.0	**79.0**	97
2003	**0.0**	*	*43.9*	*	*43*	**43**	142.0	**135.0**	88
2002	0.0	**125.4**	*45.1*	**42.8**	*42*	**43**	100.0	**95.0**	100
2001	0.0	**97.2**	*40.9*	**40.8**	*44*	**50**	86.0	**86.0**	98
2000	0.0	**80.5**	*41.1*	**41.1**	*42*	**50**	87.0	**87.0**	96
1999	0.0	**182.7**	*50.0*	**50.0**	*43*	**50**	112.0	**112.0**	100

Notes: All concentrations expressed in micrograms per cubic meter ($\mu g/m^3$).
The national annual average PM_{10} standard was revoked in December 2006 and is no longer in effect. Statistics related to the revoked standard are shown in *italics* or ***italics***.
State exceedances shown in **green**. National exceedances shown in **orange**.
*There was insufficient (or no) data available to determine the value.

Source: Air Resources Board 2010 (arb.ca.gov 2/15/10)

The ARB has designated the SCAB as non-attainment for the State ozone standard, the State PM_{10} standard and the State $PM_{2.5}$ standard. In addition, the U.S. Environmental Protection Agency has designated the South Coast Air Basin as non-attainment for the federal ozone standard and the federal PM_{10} standard.

Emissions Inventory

The ARB provides estimates of annual average emissions for the entire State broken down by counties and air basins. The latest available data for Riverside County within the South Coast Air Basin are summarized in Table 5-6.

Table 5-6
2008 Estimated Annual Average Emissions
Riverside County within South Coast Air Basin
(tons per day)

	TOG	ROG	CO	NO_X	SO_X	PM	PM_{10}	$PM_{2.5}$
Stationary Sources								
Fuel Combustion	2.2	0.3	1.8	3.5	0.7	0.2	0.2	0.2
Waste Disposal	3.4	1.2	0.0	0.1	0.0	0.4	0.2	0.0
Cleaning and Surface Coatings	4.3	3.8	0.0	0.0	0.0	0.2	0.2	0.1
Petroleum Production and Marketing	2.4	2.3	--	--	0.0	--	--	--
Industrial Processes	2.5	2.3	0.0	0.1	0.0	4.5	2.6	1.0
Total Stationary Sources	**14.8**	**10.0**	**1.9**	**3.7**	**0.4**	**5.2**	**3.1**	**1.4**
Areawide Sources								
Solvent Evaporation	14.4	12.6	--	--	--	0.0	0.0	0.0
Miscellaneous Processes	40.7	4.0	108	2.2	0.1	77.8	38.6	7.2
Total Areawide Sources	**55.1**	**16.7**	**10.8**	**2.2**	**0.1**	**77.8**	**38.6**	**7.2**
Mobile Sources								
On-Road Motor Vehicles	25.9	23.4	264.5	57.4	0.3	3.2	3.2	2.3
Other Mobile Sources	14.4	13.3	70.2	22.7	0.1	1.5	1.5	1.3
Total Mobile Sources	**40.3**	**36.7**	**334.6**	**80.1**	**0.3**	**4.8**	**4.7**	**3.7**
Natural (Non-Anthropogenic) Sources								
Natural Sources	27.8	24.1	37.7	1.1	0.3	4.0	3.8	3.2
Total Natural (Non-Anthropogenic) Sources	**27.8**	**24.1**	**37.7**	**1.1**	**0.3**	**4.0**	**3.8**	**3.2**
Total Riverside County in SCAB	**138.0**	**87.4**	**384.9**	**81.2**	**1.1**	**91.8**	**50.3**	**15.4**

Source: ARB 2009 (arb.ca.gov 2/15/10)

Regulatory Setting

Federal

The U.S. Environmental Protection Agency (EPA) is responsible for enforcing the many federal environmental and hazardous waste laws. California is under the jurisdiction of EPA Region IX with offices in San Francisco. The federal 1970 Clean Air Act (CAA) authorized the establishment of national health-based air quality standards and also set deadlines for their attainment. The federal Clean Air Act Amendments of 1990 (1990 CAAA) made major changes in deadlines for attaining National Ambient Air Quality Standards (NAAQS) and in actions required of areas of the nation that exceeded these standards. Under the CAA, state and local agencies in areas that exceed the NAAQS are required to develop state implementation plans (SIP) to show how they will achieve the NAAQS for ozone by specific dates (42 USC 7409, 7411). The EPA's responsibility to control air pollution in individual states is primarily to review submittals of SIPs that are prepared by each state. Failure of California's state and local agencies to develop a SIP by the statutory deadline resulted in a series of lawsuits and appeal that began in 1990.

On April 15, 2004, EPA issued Clean Air Ozone Rules of 2004. This new rule, issued at the same time new designations on attainment and nonattainment were issued, replaces the 1-hour ozone standard with the 8-hour ozone standard and outlines a process for reducing ground level ozone pollution.

State of California

In California, the California Air Resources Board (ARB) is responsible for preparing and enforcing the federally-required SIP in an effort to achieve and maintain NAAQS and State Ambient Air Quality Standards (SAAQS) which were developed as part of the California Clean Air Act (CCAA) adopted in 1988. SAAQS for criteria pollutants equal or surpass NAAQS and include other pollutants for which there are no NAAQS. In addition, ARB is responsible for assigning air basin attainment and nonattainment designations in California. Air basins are designated as being in attainment if the levels of a criteria pollutant meet the SAAQS for the pollutant and are designated as being in nonattainment if the level of a criteria pollutant is higher than the SAAQS.

ARB is the oversight agency responsible for regulating statewide air quality, but implementation and administration of SAAQS is delegated to several regional air pollution control districts (APCD) and air quality management districts (e.g., AQMD). These districts have been created for specific air basins and have principal responsibility for:

- developing plans to meet SAAQS and NAAQS;
- developing control measures for non-vehicular sources of air pollution necessary to achieve and maintain SAAQS and NAAQS;
- implementing permit programs established for the construction, modification, and operation of air pollution sources;
- enforcing air pollution statutes and regulations governing non-vehicular sources; and
- developing employer-based trip reduction programs.

To regulate air pollutant emissions within California, the State has been divided into 15 air basins based upon similar meteorological and geographic conditions and consideration for potential boundary lines whenever practicable. The project area is within the South Coast Air Basin.

South Coast Air Quality Management District

The South Coast Air Quality Management District (SCAQMD) is responsible for controlling emissions primarily from stationary sources of air pollution. These can include anything from large power plants and refineries to the corner gas station. There are about 28,000 such businesses operating under SCAQMD permits. Many consumer products are also considered stationary sources; these include house paint, furniture varnish, and thousands of products containing solvents that evaporate into the air. Also 23% of this area's ozone-forming air pollution comes from stationary sources, both businesses and residences. The other 77% comes from mobile sources—mainly cars, trucks and buses, but also

construction equipment, ships, trains and airplanes. Emission standards for mobile sources are established by state or federal agencies, such as the California Air Resources Board and the U.S. Environmental Protection Agency, rather than by local agencies such as the SCAQMD.

SCAQMD develops and adopts an Air Quality Management Plan (AQMP), which serves as the blueprint to bring this area into compliance with federal and State clean air standards. Rules are adopted to reduce emissions from various sources, including specific types of equipment, industrial processes, paints and solvents, even consumer products. Permits are issued to many businesses and industries to ensure compliance with air quality rules. SCAQMD staff conducts periodic inspections to ensure compliance with these requirements.

The latest Air Quality Management Plan was adopted in 2007. It is a regional and multi-agency effort (SCAQMD, California Air Resources Board, Southern California Association of Governments, and the U.S. Environmental Protection Agency). State and federal planning requirements include developing control strategies, attainment documentation, reasonable further progress, and maintenance plans.

The 2007 AQMP also incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes and new air quality modeling tools. The 2007 AQMP was adopted by SCAQMD on June 1, 2007 and by the California Air Resources Board on September 27, 2007 as part of the SIP.

Data used to prepare this section were taken from several sources. Full bibliographic entries are provided at the end of this section.

Environmental Impact Analysis

Threshold Criteria

The following thresholds of significance are based on Appendix G of the 2009 State CEQA Guidelines. For purposes of this EA/DEIR, implementation of the proposed project may have a significant adverse impact on air quality if it would:

- Conflict with or obstruct implementation of the applicable air quality plan.
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
- Result in 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors).
- Expose sensitive receptors to substantial pollutant concentrations.
- Create objectionable odors affecting a substantial number of people.

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
- Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emission of greenhouse gases.

While the final determination of whether or not a project is significant is within the purview of the lead agency pursuant to §15064 of the State CEQA Guidelines, the SCAQMD recommends that the following quantitative air pollution thresholds be used by the lead agencies in determining whether the proposed project could result in a significant impact. If the lead agency finds that the proposed project has the potential to exceed these air pollution thresholds, the project should be considered significant. These thresholds have been defined by the SCAQMD for the SCAB based on scientific data that SCAQMD has obtained and factual data within the federal and State Clean Air Acts. Because the Project is located within the SCAB and current air quality in the Project area is typical of the air basin as a whole, these thresholds are considered valid and reasonable. Each of these threshold criteria is discussed below:

Thresholds for Emissions Related to Construction Activities

Projects in the SCAB with construction-related emissions that exceed any of these thresholds[1] should be considered significant:

- Oxides of Nitrogen (NO_x): 100 pounds per day.
- Reactive Organic Gases (ROG): 75 pounds per day.
- Carbon Monoxide (CO): 550 pounds per day.
- Particulate Matter (PM_{10}): 150 pounds per day.
- Particulate Matter ($PM_{2.5}$): 55 pounds per day.
- Oxides of Sulfur (SO_x): 150 pounds per day.
- Lead (Pb): 3 pounds per day.

Thresholds for Emissions Related to Operation of a Project

Specific criteria for determining whether the potential air quality impacts of a project's operation are significant are set forth in the SCAQMD CEQA Air Quality Handbook. The criteria for these emissions thresholds include compliance with the State and National air quality standards and conformity with the existing Air Quality Management Plan (AQMP) for the SCAB. The daily operational emissions "significance" thresholds[2] are:

[1] www.aqmd.gov (11/05/07)

[2] www.aqmd.gov (11/05/07)

- Oxides of Nitrogen (NO_x): 55 pounds per day.
- Reactive Organic Gases (ROG): 55 pounds per day.
- Carbon Monoxide (CO): 550 pounds per day.
- Particulate Matter (PM_{10}): 150 pounds per day.
- Particulate Matter ($PM_{2.5}$): 55 pounds per day.
- Oxides of Sulfur (SO_x): 150 pounds per day.
- Lead (Pb): 3 pounds per day.

Localized Significance Thresholds

In accordance with SCAQMD's Governing Board's direction, the staff developed the localized significance threshold (LST) methodology and mass rate look-up tables, which were formally adopted by the Governing Board on October 3, 2003 for voluntary use by other public agencies. The mass rate LST look-up tables are only applicable to the following criteria pollutants: oxides of nitrogen (NO_x), carbon monoxide (CO), particulate matter less than 10 microns in aerodynamic diameter (PM_{10}) and particulate matter less than 2.5 microns in aerodynamic diameter ($PM_{2.5}$). The mass rate look-up tables were developed for each source receptor area (SRA) and can be used on a voluntary basis by public agencies to determine whether or not a project may generate significant adverse localized air quality impacts. LST's represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable federal or State ambient air quality standard, and are developed based on the ambient concentrations of that pollutant for each SRA. For PM_{10} LST's, mass rate look-up tables were derived based on requirements in SCAQMD's Rule 403, Fugitive Dust.

The use of LST's is voluntary, to be implemented at the discretion of local public agencies acting as lead agencies pursuant to the CEQA or NEPA. The LST's established for construction of the Recycled Water Distribution Pipeline Expansion Project, based on a disturbed area of 1 acre and 25 meters to the nearest receptor, are as follows *(SCAQMD, September 2008):*

- Oxides of Nitrogen (NO_x): 162 pounds per day.
- Carbon Monoxide (CO): 661 pounds per day.
- Particulate Matter (PM_{10}): 4 pounds per day.
- Particulate Matter ($PM_{2.5}$): 3 pounds per day.

Toxic Air Contaminants (TACs)

For projects that emit toxic air contaminants (TACs) or for projects with a sensitive receptor within one-quarter mile of a facility that emits TACs, the California Air Resources Board recommends that a health risk assessment (HRA) be conducted. If the HRA determines that the TAC emissions either individually or cumulatively result in an individual cancer risk exceeding ten in one million, it is considered a significant impact.

Greenhouse Gases (GHGs)

No agency has established quantitative significance thresholds for greenhouse gases at this time. However, SCAQMD has suggested significance screening levels of 10,000 metric tons (MT)[3] per year CO_2 equivalents for industrial projects and 3,000 MT per year CO_2 equivalents for commercial/residential projects.

The Council on Environmental Quality (CEQ) has issued draft GHG guidelines that direct federal agencies to quantify and described expected direct and indirect GHG emissions where the emissions "may be meaningful". While CEQ has not proposed a specific GHGV significance threshold, it proposes that annual direct GHG emissions of 25,000 metric tons or more of CO_2 equivalent are "meaningful". But the guidance also indicates that GHG emissions of less than 25,000 MT of CO_2 emissions may warrant evaluation in NEPA documents. How much below that amount will be "meaningful" will surely be subject to extensive litigation.

De Minimus Thresholds

Pursuant to 40 CFR Part 51, Subpart W, §51.853, paragraphs (b)(1) and (b)(2), the emission levels that trigger an air quality conformity analysis in the South Coast Air Basin are as follows:

- Nitrogen Dioxide (NO_2): 100 tons per year.
- Carbon Monoxide (CO): 100 tons per year.
- Particulate Matter (PM_{10}): 70 tons per year.
- Volatile Organic Compounds (VOC): 10 tons per year.
- Sulfur Dioxide (SO_2): 100 tons per year.
- Lead (Pb): 25 tons per year.

These threshold criteria are used in this EA/DEIR in determining significance of air quality impacts.

[3] One metric ton equals 1.10 tons (2,200 pounds).

Environmental Analysis

Potential Impact: Conflict with or obstruct implementation of the applicable air quality plan.

A project is deemed inconsistent with air quality plans if it would result in population and/or employment growth that exceeds growth estimates included in applicable air quality management plans (i.e., South Coast Air Quality Management District's 2007 Air Quality Management Plan). The Air Quality Management Plan is based on general plans from local jurisdictions. The Air Quality Management Plan accounts for development that would occur as a result of implementation of the local general plans. Therefore, no impacts are anticipated and no mitigation is required.

Significance of Impact:

No impact.

Mitigation Measure:

No mitigation is required.

Potential Impact: Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

Heavy construction equipment such as backhoes, loaders, trucks, tractors and other equipment powered by internal combustion engines would emit various levels of air pollutants. It is anticipated that the kinds of construction equipment to be used at each construction site are provided in Table 5-7.

Table 5-7
Typical Heavy Construction Equipment List per Sub-Project

Equipment	Number	Utilization Factor
Compressor	1	0.2
Concrete Saw	1	0.1
Pavement Breaker	1	0.1
Backhoe/Loader	2	0.6
Dump Trucks	1	0.6
Utility Trucks	1	0.6
Crane	1	0.1
Hydraulic Excavator	1	0.8
Water Truck	1	0.2
Compactor	1	0.1
Sweeper	1	0.1
Paver	1	0.1
On-Road Trucks	2	1.0
Pickups	2	1.0

SCAQMD has also developed heavy equipment emission factors to assist in the preparation of environmental documents. These emission factors for the above equipment are presented in Table 5-8.

Table 5-8
Exhaust Emission Factors for Construction Equipment

Equipment	Units	ROG	CO	NO_x	SO_x	PM_{10}	CO_2	CH_4
Compressor	pounds/hour	0.0984	0.3445	0.6494	0.0007	0.0469	63.6	0.0089
Concrete Saw	pounds/hour	0.1090	0.4148	0.5910	0.0007	0.0491	58.5	0.0098
Pavement Breaker	pounds/hour	0.1204	0.04365	0.8114	0.0008	0.0570	68.9	0.0109
Backhoe/ Loader	pounds/hour	0.0862	0.3824	0.5816	0.0008	0.0435	66.8	0.0078
Dump Truck	pounds/hour	0.2241	0.6635	2.0158	0.0027	0.0715	260	0.0202
Utility Truck	pounds/hour	0.2241	0.6635	2.0158	0.0027	0.0715	260	0.0202
Crane	pounds/hour	0.1425	0.4946	1.2753	0.0014	0.0553	129	0.0129
Hydraulic Excavator	pounds/hour	0.1200	0.5401	0.9817	0.0013	0.0536	120	0.0117
Water Truck	pounds/hour	0.2241	0.6635	2.0158	0.0027	0.0715	260	0.0202
Compactor	pounds/hour	0.0050	0.0263	0.0314	0.0001	0.0013	4.3	0.0005
Sweeper	pounds/hour	0.1278	0.5215	0.7403	0.0009	0.0576	78.5	0.0115
Paver	pounds/hour	0.1596	0.5445	0.8980	0.0009	0.0642	77.9	0.0144
On-Road Trucks	pounds/mile	0.00252764	0.01021519	0.03092379	0.00004042	0.00149566	4.21590774	0.00011651
Pickups	pounds/mile	0.00079628	0.00765475	0.00077583	0.00001073	0.00008979	1.10152540	0.00007169

Notes: Emission factors based on a mid-construction year of 2012
ROG = reactive organic gases
CO = carbon monoxide
NO_X = oxides of nitrogen
SO_X = oxides of sulfur
PM_{10} = particulate matter
CO_2 = carbon dioxide
CH_4 = methane
Heavy-duty On-Road Trucks Emission Factors Based on Highest Most Conservative EMFACE 2007 (Version 2.3)
Pickup Emission Factors Based on Highest (Most Conservative) EMFAC 2007 (Version 2.3)
Source: www.aqmd.gov (4/13/10)

Based on the equipment list shown in Table 5-7 and the emission factors shown in Table 5-8, estimated emissions from the heavy equipment to be on the job sites are shown in Table 5-9.

Table 5-9
Estimated Emissions from Heavy Construction Equipment per Sub-Project (pounds per day)[1]

	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$[2]	CO_2	CH_4
Construction[3]	5	19	48	0	2	2	5,422	0
Threshold Limits[4]	75	550	100	150	150	55	N/A	N/A
Localized Significance Thresholds[5]	N/A	661	162	N/A	4	3	N/A	N/A

[1] Based on the assumption that the equipment operates eight hours per day.
[2] Based on the assumption that $PM_{2.5}$ emissions are 89 percent of PM_{10} emissions for combustion sources. *(SCAQMD, October 2006).*
[3] Based on EMFAC 2007 (version 2.3) emission factors and the assumption that each on-road truck travels 100 miles per day and each pickup truck travels 50 miles per day.
[4] Construction-related threshold limits developed by SCAQMD to determine significance.
[5] Localized threshold limits developed by SCAQMD to determine significance.

As can be seen by the data in Table 5-9, emissions from heavy construction equipment would not exceed SCAQMD's construction-related threshold criteria at the individual job sites.

Vehicles owned by construction workers would be an additional source of air pollutants. An estimate of emissions based on 5 worker vehicles per day of which 100 percent are pickup trucks (gross vehicle weight of 8,500 pounds or less) with an average round trip of 60 miles is presented in Table 5-10.

Table 5-10
Construction Worker Commute Vehicle Emissions[1]

	Pollutant (pounds per day)							
	ROG	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Totals	0.27	2.48	0.28	0.00	0.03	0.02	329	0.02
Threshold[2]	75	550	100	150	150	55	N/A	N/A

[1] Based on EMFAC 2007 (version 2.3) emission factors and the assumption that each pickup truck travels 60 miles per day.

[2] Construction-related threshold limits developed by SCAQMD to determine significance.

As can be seen by the data in Table 5-10, exhaust emissions from commuter traffic to and from the job site would not be sufficient to have any local adverse effect.

Installation of the proposed Project would create fugitive dust emissions. SCAQMD estimates that 26.4 pounds per acre per day of fugitive dust emissions from construction activities on disturbed soil. Based on this estimate and an exposed area of 0.1 acre per day, the estimated fugitive dust emissions from grading, etc., would be 2.6 pounds per day. If the soil is watered every three hours, this estimate can be reduced by 61% resulting in approximately 1.01 pounds per day of fugitive dust from the construction activities. SCAQMD also estimates that the $PM_{2.5}$ emissions in fugitive dust are equal to 21 percent of the PM_{10} emissions in fugitive dust *(SCAQMD, October 2006).* Therefore, the $PM_{2.5}$ emissions would equal 0.2 pounds per day.

The total estimated emissions from the installation of the proposed pipelines per sub-project are shown in Table 5-11.

Table 5-11
Total Estimated Construction Emissions Per Sub-Project
(pounds per day)

	ROG	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Construction Equipment	5	19	43	0	2	2	5,422	0
Worker Commutes	0	2	0	0	0	0	329	0
Fugitive Dust	0	0	0	0	1	0	0	0
Total	5	21	43	0	3	2	5,751	0
Threshold Limits[1]	75	550	100	150	150	55	N/A	N/A
Localized Thresholds[2]	N/A	661	162	N/A	4	3	N/A	N/A

[1] Threshold limits developed by SCAQMD to determine significance.

[2] Localized significant thresholds developed by SCAQMD to determine localized significance, based on a work area of 1 acre and a 25 meter distance to the nearest receptor.

As shown in Table 5-11, the total estimated emissions from the installation of the proposed Sub-Projects would not exceed the construction-related threshold criteria for significance.

In the unlikely event that more than one sub-project were constructed at the same time, it would be possible that the total construction emissions would exceed SCAQMD's thresholds for significance as shown in Table 5-12.

Table 5-12
Estimated Cumulative Construction Emissions
(pounds per day)

No. of Sub-Projects	ROG	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
One Sub-Project	5	21	43	0	3	2	5,751	0
Two Sub-Projects	10	42	86	0	6	4	11,502	0
Three Sub-Projects	15	63	**129**	0	9	6	17,253	0
Four Sub-Projects	20	84	**172**	0	12	8	23,004	0
Five Sub-Projects	25	105	**215**	0	15	10	28,755	0
Threshold Limits[1]	75	550	100	150	150	55	N/A	N/A

As can be seen by the data in Table 5-12, should three or more sub-projects be constructed at the same time, the estimated oxides of nitrogen emissions would exceed SCAQMD's significance thresholds.

Routine maintenance of the facilities would insure proper operation of the facilities and reduce impacts. This would include approximately one trip per week to the project facilities. The amount of emissions from one pickup trip per week would be considered less than significant by any threshold criteria.

Toxic Air Contaminants (TACs)

The combustion of diesel fuel produces diesel particulate matter as a byproduct. Diesel particulate matter has been identified by the California Air Resources Board (ARB) as a toxic air contaminant (TAC). While TACs can have long-term and/or short-term effects, diesel TAC has been shown by the ARB to have little or no short-term impact.

The ARB determined that the chronic impact of diesel particulate matter was of more concern than the acute impact in the Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines *(ARB 2000)*. In that document, ARB noted that "Our analysis shows that the potential cancer risk from inhalation is the critical path when comparing cancer and non-cancer risk. In other words, a cancer risk of 10 cases per million from the inhalation of diesel particulate matter (PM) will result from diesel PM concentrations that are much less than the diesel PM or TAC concentrations that would result in chronic or acute non-cancer hazard index values of 1 or greater." Consequently, any analysis of diesel TAC should focus on the long-term, chronic cancer risk posed by diesel emissions. Chronic cancer risk is normally measured by assessing what the risk to an exposed individual from a source of TACs would be if the exposure occurred over 70 years. Diesel emissions related to the proposed Project would only occur over a two to three year period. Therefore, the impact would be considered less than significant and no further analysis is required.

Greenhouse Gases (GHGs)

No agency has established quantitative significance thresholds for greenhouse gases at this time. However, SCAQMD has suggested significance screening levels of 10,000 MT per year CO_2 equivalents for industrial projects and 3,000 MT per year CO_2 equivalents for commercial/residential projects. Estimated construction duration and CO_2 emissions for each sub-project area are presented in Table 5-13.

Table 5-13
Estimated Carbon Dioxide (CO_2) Emissions from Construction

Sub-Project Area	Construction Days	Metric Tons/Day	Metric Tons/Year
Diamond Valley	120	2.614	314
Menifee	210	2.614	549
French Valley	100	2.614	261
Moreno Valley/Perris North	100	2.614	261
San Jacinto	100	2.614	261
Totals			1,646

Based on the information presented in Table 5-13, the total CO_2 emissions from construction of the individual Sub-Projects would be range from 261 MT per year to 549 MT per year. Therefore, the greenhouse gas emissions from construction of each Sub-Project would be considered less than significant. In the unlikely event that all five Sub-Projects were constructed at the same time, the CO_2 emission would be 1,646 MT per year which would also be considered less than significant based on SCAQMD's suggested screening level thresholds of 3,000 MT per year.

De Minimus Thresholds

A summary comparison of estimated emissions from construction and "de minimus" thresholds is provided in Table 5-14.

Table 5-14
Comparison of Estimated Emissions from Construction and "De Minimus" Thresholds

Sub-Project Area	Construction Days	Tons/Day	Tons/Year
Carbon Monoxide (CO)			
Diamond Valley	120	0.0105	1.26
Menifee	210	0.0105	2.21
French Valley	100	0.0105	1.05
Moreno Valley/Perris North	100	0.0105	1.05
San Jacinto	100	0.0105	1.05
Totals			6.62
"DeMininus" Thresholds			100
Reactive Organic Gases (ROG)			
Diamond Valley	120	0.0025	0.30
Menifee	210	0.0025	0.52
French Valley	100	0.0025	0.25
Moreno Valley/Perris North	100	0.0025	0.25
San Jacinto	100	0.0025	0.25
Totals			1.57
"DeMininus" Thresholds			10
Oxides of Nitrogen (NO_x)			
Diamond Valley	120	0.0215	2.58
Menifee	210	0.0215	4.52
French Valley	100	0.0215	2.15
Moreno Valley/Perris North	100	0.0215	2.15
San Jacinto	100	0.0215	2.15
Totals			13.55
"DeMininus" Thresholds			100
Oxides of Sulfur (SO_x)			
Diamond Valley	120	0	0
Menifee	210	0	0
French Valley	100	0	0
Moreno Valley/Perris North	100	0	0
San Jacinto	100	0	0
Totals			0
"DeMininus" Thresholds			100

Sub-Project Area	Construction Days	Tons/Day	Tons/Year
Particulate Matter (PM_{10})			
Diamond Valley	120	0.0015	0.18
Menifee	210	0.0015	0.32
French Valley	100	0.0015	0.15
Moreno Valley/Perris North	100	0.0015	0.15
San Jacinto	100	0.0015	0.15
Totals			0.95
"DeMininus" Thresholds			70

As can be seen by the data in Table 5-14, the estimated emissions from construction of all five Sub-Projects at the same time are well below the "de minimis" thresholds for the South Coast Air Basin. Therefore, an air quality conformity analysis is not required.

For SRF-funded projects an additional requirement exists with respect to conformity analysis. A CAA general conformity analysis applies only to projects in a nonattainment area or an attainment area subject to a maintenance plan and is required for each criteria pollutant for which an area has been designated nonattainment or maintenance. If a project's emissions are below the "de minimus" level and are less than 10% of the areas inventory specified for each criteria pollutant in a nonattainment or maintenance area, further general conformity analysis is not required.

The ARB has designated the SCAB as non-attainment for the State ozone standard, the State PM_{10} standard and the State $PM_{2.5}$ standard. In addition, the U.S. Environmental Protection Agency has designated the South Coast Air Basin as non-attainment for the federal ozone standard and the federal PM_{10} standard. Therefore, the project's estimated emissions for ozone precursors (i.e., oxides of nitrogen, volatile organic compounds and carbon monoxide) and particulate matter must be compared with the emissions inventory for these pollutants. That comparison is provided in Table 5-15.

Table 5-15
Comparison of Project's Emissions with Emissions Inventory
(tons per day)

	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$
Estimated Emissions	0.0125	0.0525	0.1075	0.0075	0.0050
Emissions Inventory	87.4	384.9	81.2	50.3	15.4
Project Percentage of Inventory	0.014	0.014	0.132	0.015	0.032

As can be seen by the data in Table 5-15, the percentage of the project's estimated emissions compared to the emissions inventory for the area are several magnitudes less than 10. Therefore, no further general conformity analysis is required.

Significance of Impact:

Less than significant for individual Sub-Projects but significant for the project as a whole with respect to oxides of nitrogen emissions during construction.

Mitigation Measures:

EMWD should include the following mitigation measures in its standard construction specifications to reduce the air quality impacts:

- Maintain construction equipment engines by keeping them properly tuned and maintained according to manufacturer's specifications.
- Use alternative fuels or clean and low-sulfur fuel for equipment.
- Do not idle diesel trucks onsite for more than 5 minutes at a time.
- Require construction equipment that meet or exceed Tier 3 emission standards and equip construction equipment with CARB verified oxidation catalysts and particulate traps.
- Spread soil binders on site, where appropriate, unpaved roads and staging areas.
- Water site and equipment every three hours during active construction periods.
- Sweep all streets at least once per day using SCAQMD Rule 1186 certified street sweepers or roadway washing trucks if visible soil materials are carried to adjacent streets.
- Suspend grading activities during first and second stage smog alerts and during high winds in accordance with SCAQMD Rule 403 requirements.
- If necessary, wash off trucks leaving the site.
- Cover haul trucks.

Potential Environmental Effects of Mitigation Measures

All physical improvements or activities that could result in changes to the physical environment required by these mitigation measures would be located within areas evaluated elsewhere in this EA/DEIR. The impacts of implementing such measures, if any, would be similar to those identified for the project in Sections 3 through 18 of this EA/DEIR.

Level of Significance After Mitigation

Implementation of the above mitigation measures would insure that no impacts to air quality occurred due to implementation of individual components of the Project. However, they would not reduce the combined oxides of nitrogen, carbon dioxide and particulate emissions during construction of all five Sub-Projects at the same time to a less than significant level.

Potential Impact: 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors).

The ARB has designated the SCAB as non-attainment for the State ozone standard, the State PM_{10} standard and the State $PM_{2.5}$ standard. In addition, the Environmental Protection Agency has designated the SCAB as non-attainment for the federal ozone standard and the federal PM_{10} standard. The proposed Project would generate emissions during the construction phase. However, as shown in Table 5-11 the total estimated emissions from the installation of the individual Project components would not exceed the thresholds for significance recommended by the SCAQMD.

Significance of Impact:

Less than significant for individual Sub-Projects but significant for the project as a whole with respect to oxides of nitrogen emissions during construction.

Mitigation Measure:

No additional mitigation beyond that shown above is feasible.

Potential Impact: Expose sensitive receptors to substantial pollutant concentrations.

As shown in Table 5-11, construction emissions from the individual Sub-Projects are considered less than significant by the SCAQMD's threshold criteria for significance.

Significance of Impact:

Less than significant for individual Sub-Projects but significant for the project as a whole with respect to oxides of nitrogen emissions during construction.

Mitigation Measure:

No additional mitigation beyond that shown above is feasible.

Potential Impact: Create objectionable odors affecting a substantial number of people.

The proposed Project is a recycled water distribution facility. Therefore, neither construction nor operation of the Project would create or cause objectionable odors.

Significance of Impact:

No Impact.

Mitigation Measure:

None required.

Potential Impact: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

As shown above, greenhouse gas emissions are less than the suggested thresholds of significance developed by SCAQMD for the Project as a whole.

Significance of Impact:

Less than significant.

Mitigation Measure:

No additional mitigation beyond that shown above is feasible.

Potential Impact: Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

As shown above, greenhouse gas emissions are less than the suggested thresholds of significance developed by SCAQMD for the Project as a whole.

Significance of Impact:

Less than significant.

Mitigation Measure:

None required.

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6 Biological Resources

Environmental Setting

Introduction

Eastern Municipal Water District (EMWD) pursuant to its *Mandatory Use Policy for Recycled Water* (2003) and its *Recycled Water Strategic Plan* (2009), proposes to construct the Recycled Water Distribution Project (Project) which includes 89,405 feet of variously-sized recycled water pipelines located within five geographic service areas as shown on Figure 6-1: Diamond Valley, Menifee, French Valley, Moreno Valley-Perris North, and San Jacinto. The recycled water pipelines would vary in diameter from 8 to 24 inches. Most of the pipeline alignments are within the right-of-ways (ROW) of existing paved roadways. However, at a few locations, the pipelines would traverse undeveloped agricultural land or would be buried within the ROWs of unpaved roadways (Figures 6-2 through 6-6).

Survey Methodology

The results of special-status species and habitat surveys conducted along the proposed recycled water pipeline alignments follows. Prior to the field survey a list of potential special-status taxa and habitats was prepared based on occurrence records from a two-mile buffer surrounding each of the pipeline alignments derived from the California Department of Fish and Game's California Natural Diversity Database (CNDDB; http://www.dfg.ca.gov/biogeodata/cnddb/). The CNDDB results are provided in Appendix C for Bachelor Mt., Perris, Lakeview, San Jacinto, Romoland, and Hemet, U.S. Geological Survey 1:24,000 topographic quadrangles). CNNDB occurrence records for each of the five geographic service areas are illustrated on Figures 6-7 through 6-12. Table C-1 (Appendix C) presents a summary of special-status species occurrence records by geographic service area.

Descriptive data for undeveloped land parcels traversed by or adjacent to each pipeline alignment were obtained from the online County of Riverside, Transportation and Land Management Agency's Land Information Geographic Information System (RCTLMA GIS) (http://www3.tlma.co.riverside.ca.us/pa/rclis/). Soils data for undeveloped land and unpaved roadways were obtained from the online U.S. Department of Agriculture, Natural Resources Conservation Service, National Cooperative Soil Survey, Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/). Species-specific habitat requirements were obtained from online sources, including County of Riverside, Transportation and Land Management Agency's Western Riverside County Multiple Species Habitat Conservation Plan (WRCMSHCP; http://www.rctlma.org/mshcp/volume1/index.html), and the CalFlora database (http://www.calflora.org/).

Pedestrian field surveys of the pipeline alignments were conducted on 10 April 2010.

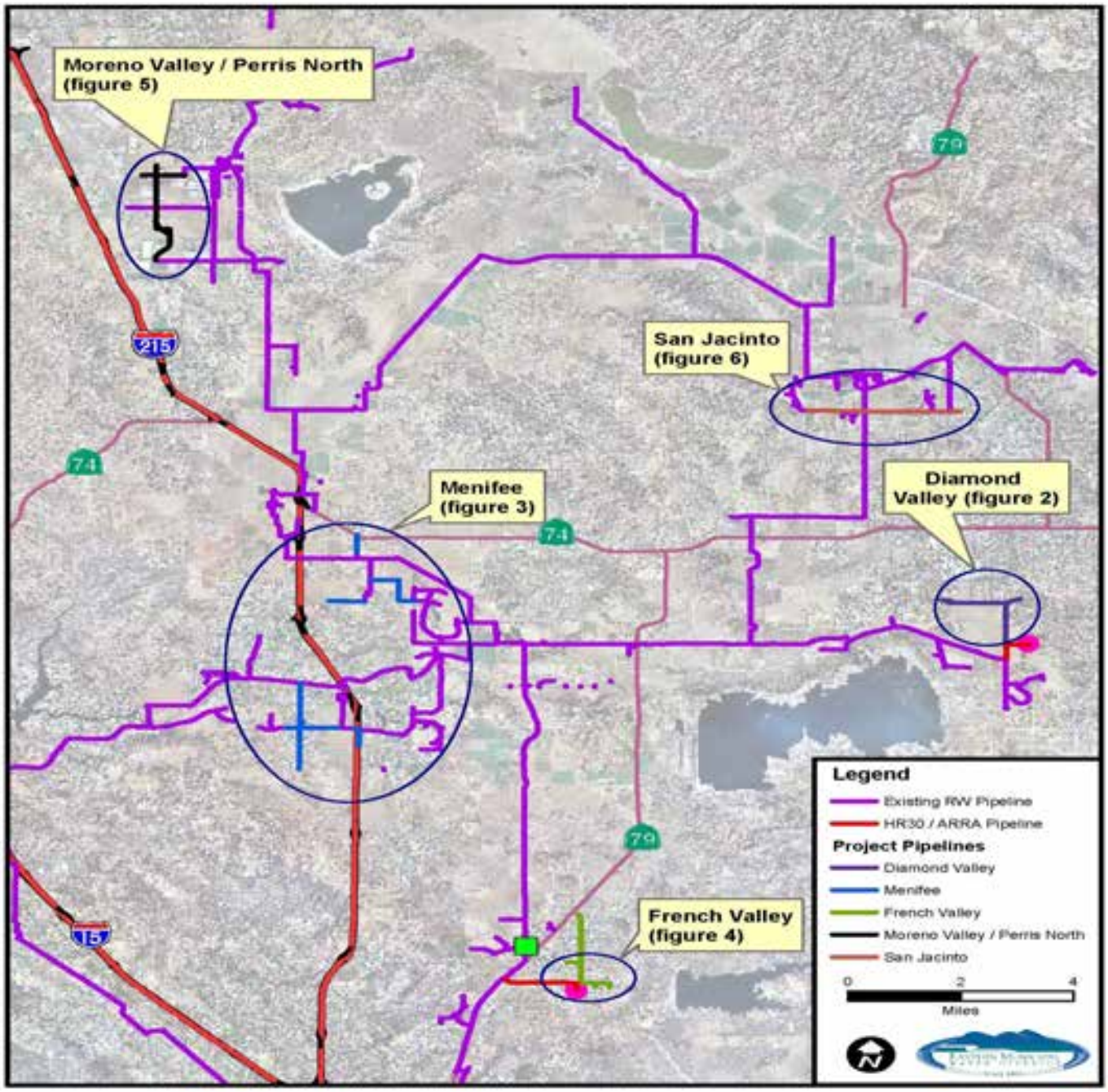

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Figure 6-1
Recycled Water Distribution Pipelines

Environmental Assessment/Draft Environmental Impact Report
Recycled Water Distribution Pipeline Expansion Project
U.S. Bureau of Reclamation/Eastern Municipal Water District

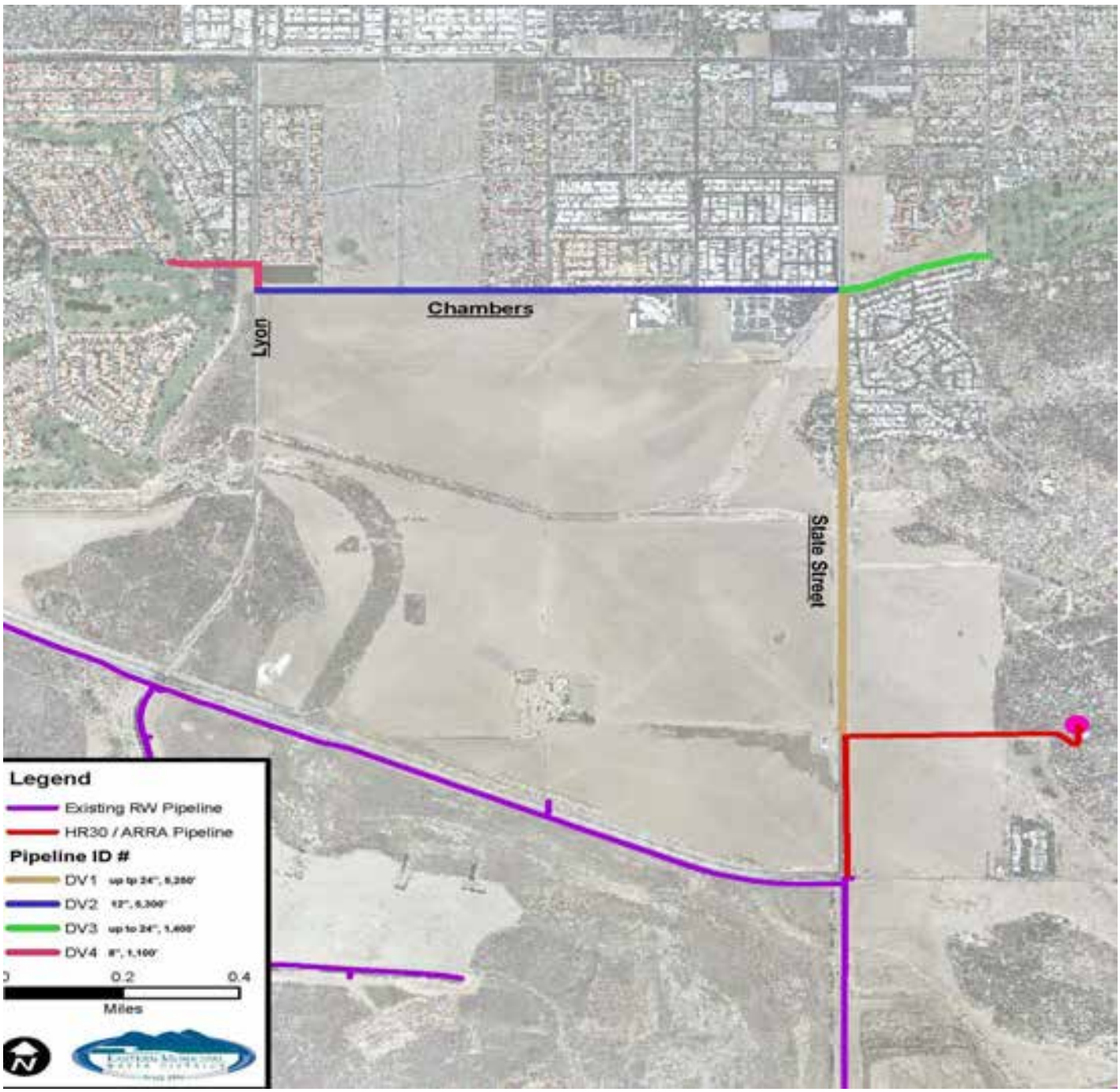

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Figure 6-2
Diamond Valley Recycled Water Distribution Pipelines

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Recycled Water Distribution Pipeline Expansion Project
U.S. Bureau of Reclamation/Eastern Municipal Water District

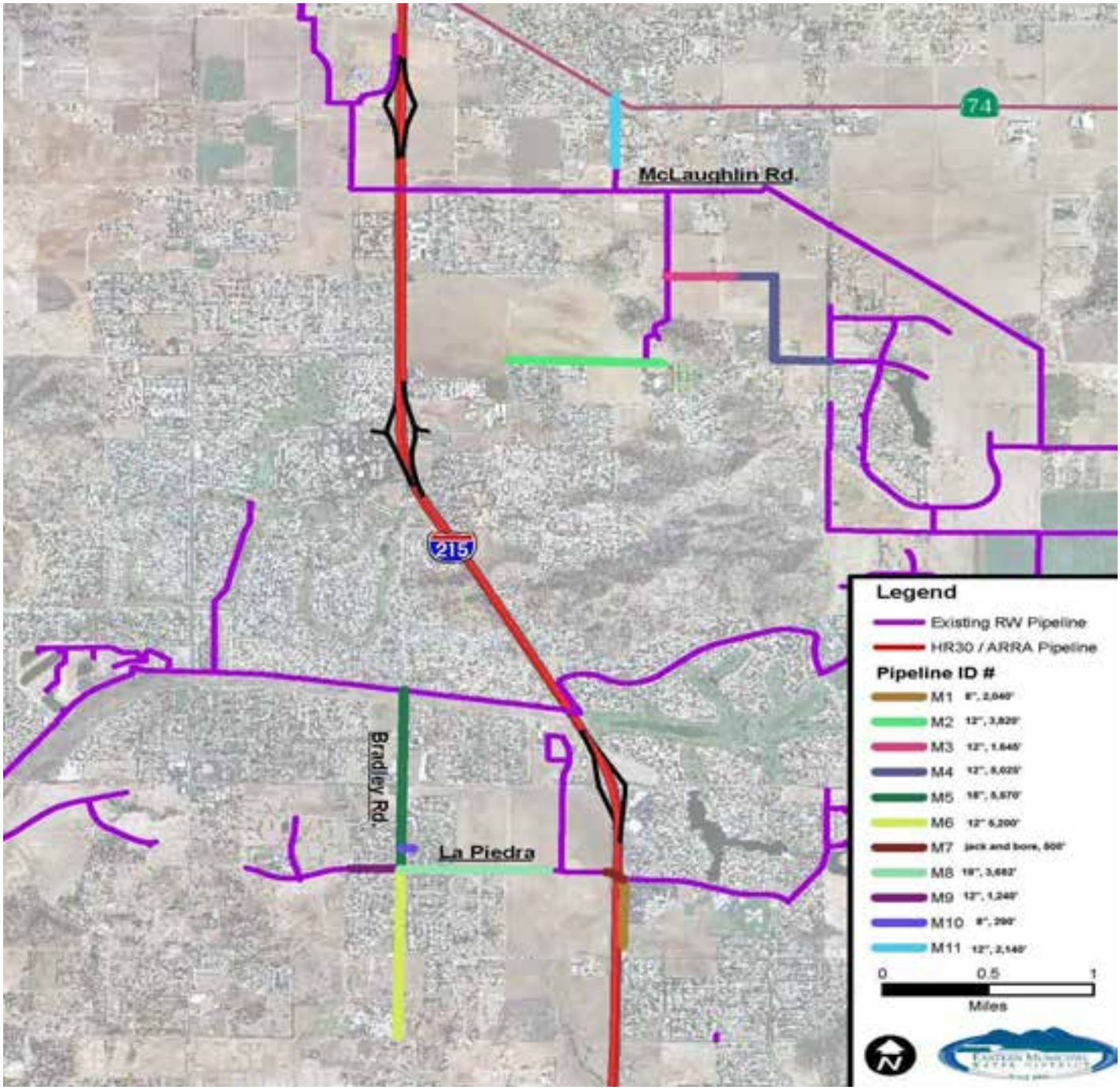

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Figure 6-3
Menifee Recycled Water Distribution Pipelines

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U.S. Bureau of Reclamation/Eastern Municipal Water District

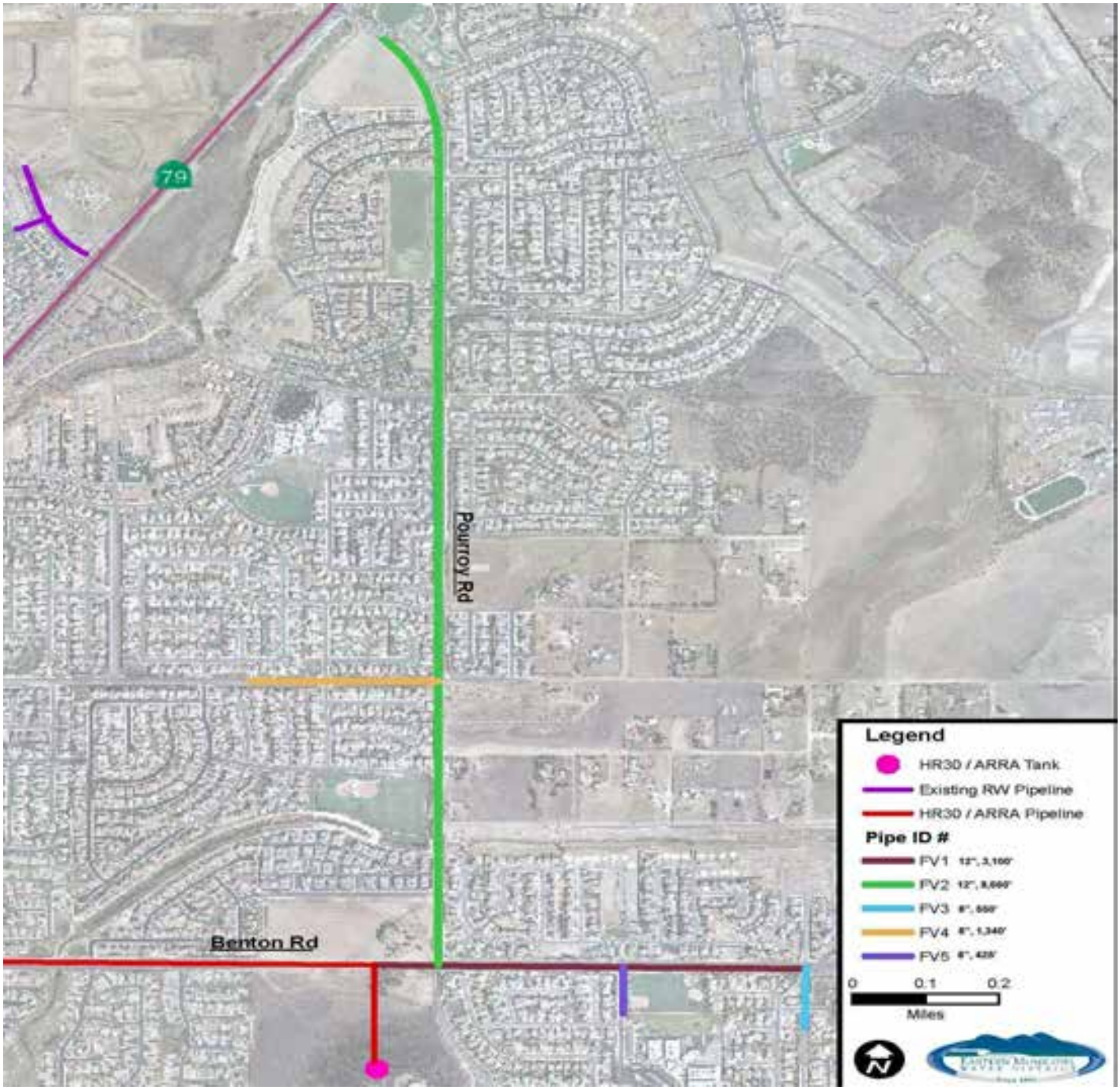

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Figure 6-4
French Valley Recycled Water Distribution Pipelines

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U.S. Bureau of Reclamation/Eastern Municipal Water District

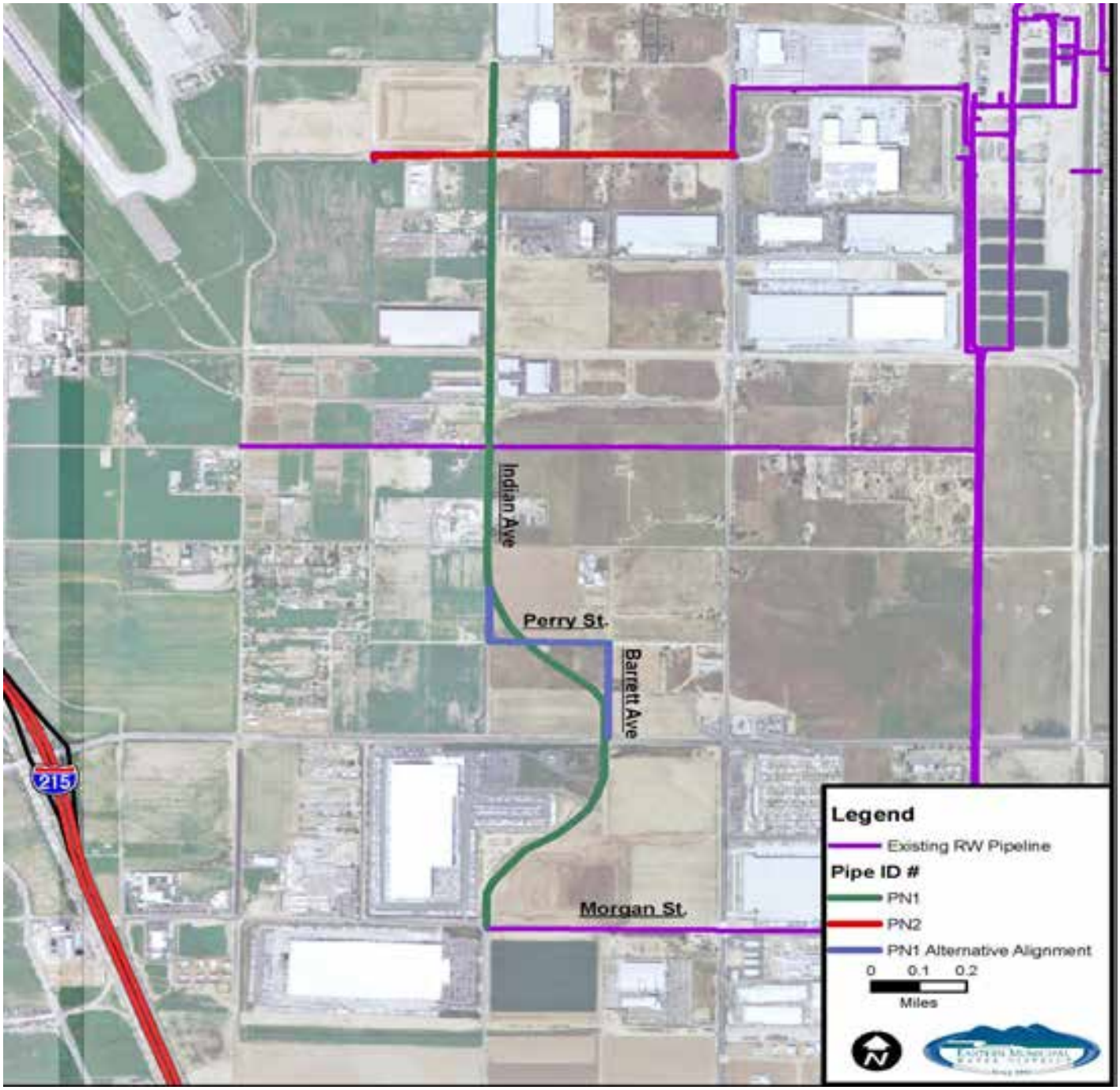

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Figure 6-5
Moreno Valley/Perris North Recycled Water Distribution Pipelines

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Recycled Water Distribution Pipeline Expansion Project
U.S. Bureau of Reclamation/Eastern Municipal Water District

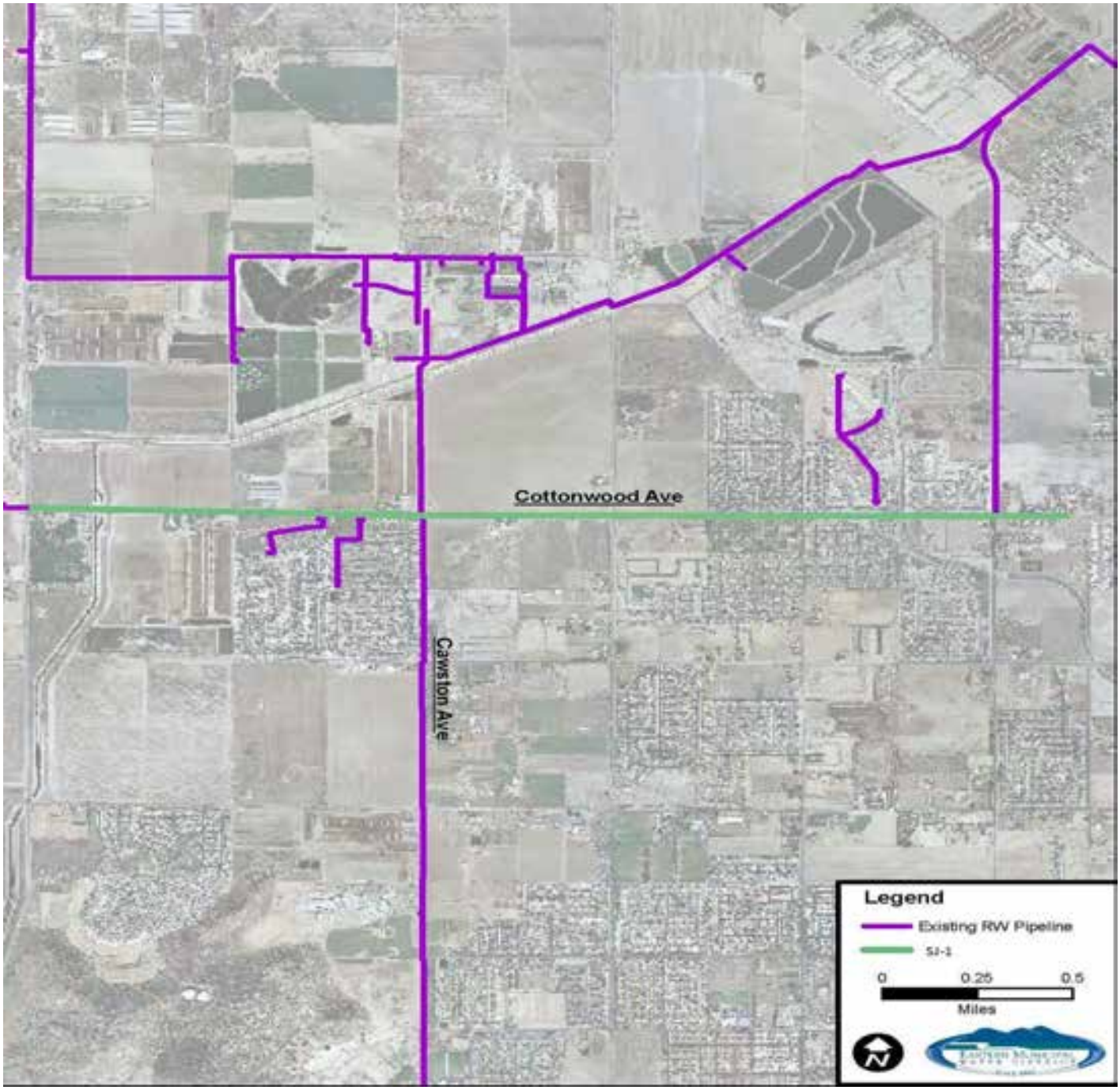

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Figure 6-6
San Jacinto Recycled Water Distribution Pipelines

Environmental Assessment/Draft Environmental Impact Report
Recycled Water Distribution Pipeline Expansion Project
U.S. Bureau of Reclamation/Eastern Municipal Water District

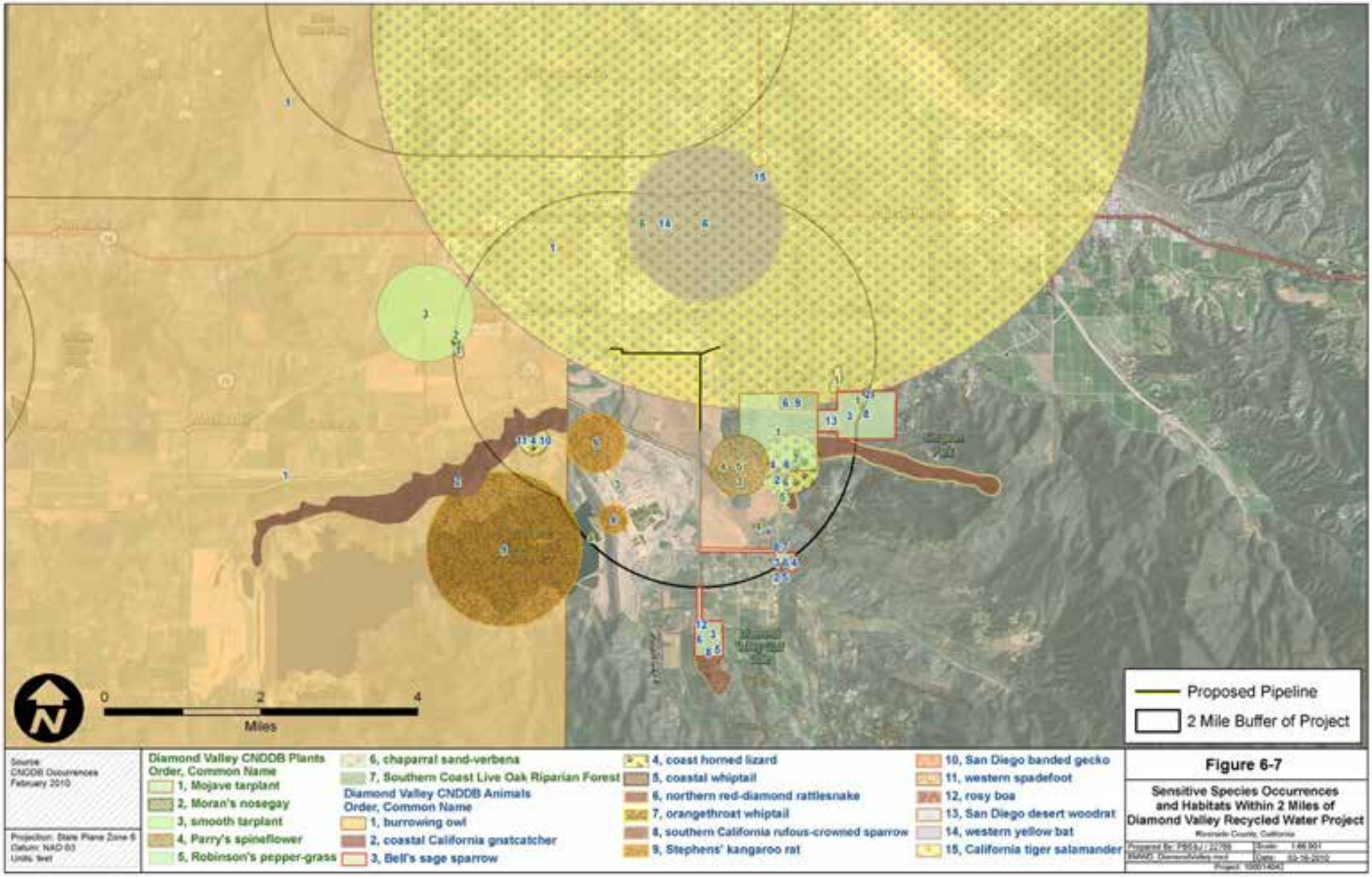
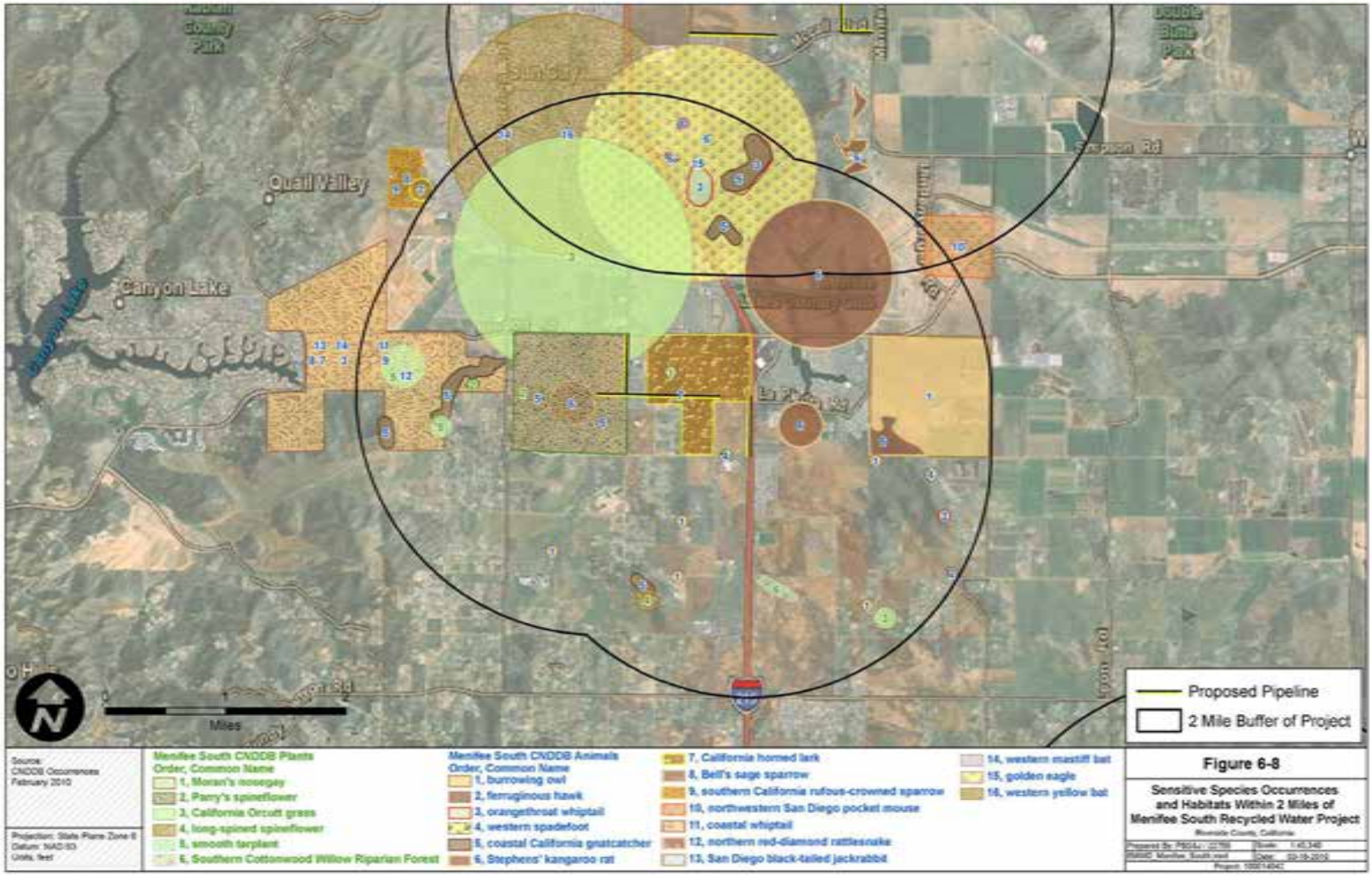


Figure 6-7

Sensitive Species Occurrences and Habitats Within 2 Miles of Diamond Valley Recycled Water Project

Riverside County, California


Quail Valley
Canyon Lake
Sunbury
Sixpoon Rd
La Plata Rd
Double Butte Park
Miles
Proposed Pipeline
2 Mile Buffer of Project
Source:
CNDDB Occurrences
February 2010
Projection: State Plane Zone 6
Datum: NAD83
Units: feet
Menifee South CNDDB Plants
Order, Common Name
1, Moran's nosegay
2, Parry's spineflower
3, California Orcutt grass
4, long-spined spineflower
5, smooth tarplant
6, Southern Cottonwood Willow Riparian Forest
Menifee South CNDDB Animals
Order, Common Name
1, burrowing owl
2, ferruginous hawk
3, orangethroat whiptail
4, western spadefoot
5, coastal California gnatcatcher
6, Stephens' kangaroo rat
7, California horned lark
8, Bell's sage sparrow
9, southern California rufous-crowned sparrow
10, northwestern San Diego pocket mouse
11, coastal whiptail
12, northern red-diamond rattlesnake
13, San Diego black-tailed jackrabbit
14, western mastiff bat
15, golden eagle
16, western yellow bat
Figure 6-8
Sensitive Species Occurrences and Habitats Within 2 Miles of Menifee South Recycled Water Project

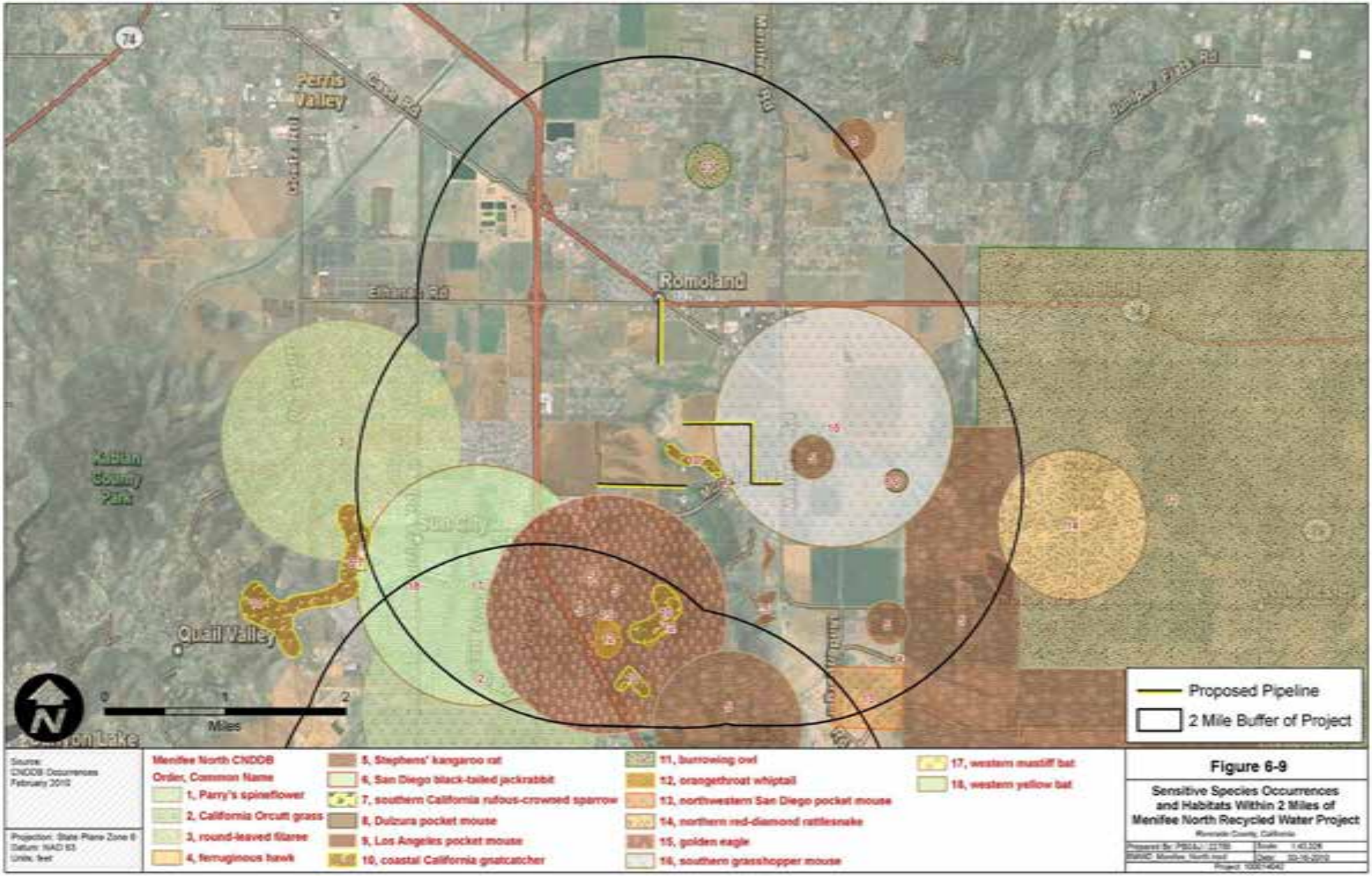
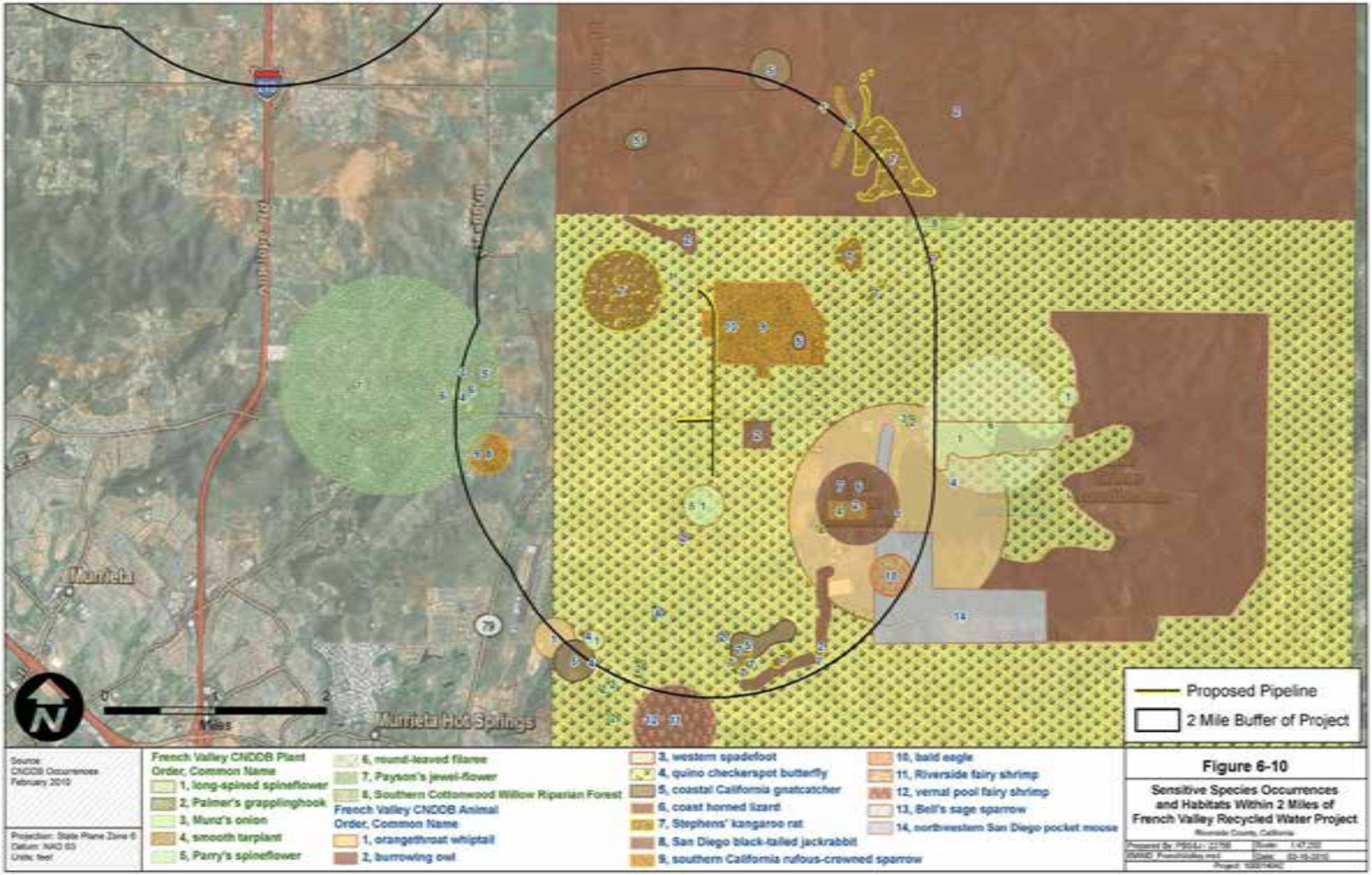
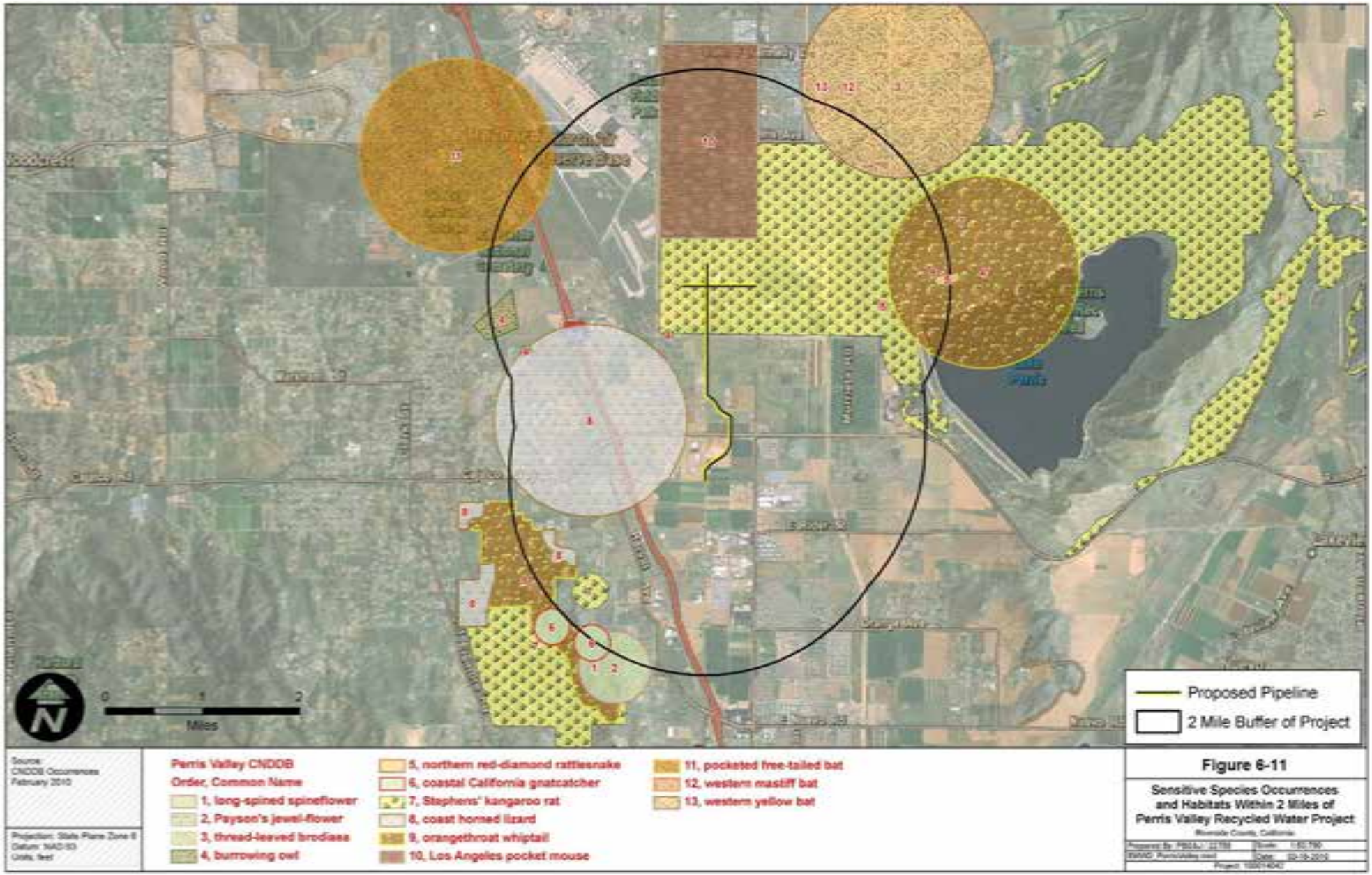


Figure 6-9

Sensitive Species Occurrences and Habitats Within 2 Miles of Menifee North Recycled Water Project

Riverside County, California


Proposed Pipeline
2 Mile Buffer of Project
Murrieta
Murrieta Hot Springs
Miles
Source:
CNDDB Occurrences
February 2010
Projection: State Plane Zone 6
Datum: NAD 83
Units: feet
French Valley CNDDB Plant Order, Common Name
1, long-spined spineflower
2, Palmer's grapplinghook
3, Munz's onion
4, smooth tarplant
5, Parry's spineflower
6, round-leaved filarree
7, Payson's jewel-flower
8, Southern Cottonwood Willow Riparian Forest
French Valley CNDDB Animal Order, Common Name
1, orangethroat whiptail
2, burrowing owl
3, western spadefoot
4, quino checkerspot butterfly
5, coastal California gnatcatcher
6, coast horned lizard
7, Stephens' kangaroo rat
8, San Diego black-tailed jackrabbit
9, southern California rufous-crowned sparrow
10, bald eagle
11, Riverside fairy shrimp
12, vernal pool fairy shrimp
13, Bell's sage sparrow
14, northwestern San Diego pocket mouse
Figure 6-10
Sensitive Species Occurrences and Habitats Within 2 Miles of French Valley Recycled Water Project


Proposed Pipeline
2 Mile Buffer of Project
0 1 2
Miles
Source:
CNDDB Occurrences
February 2010
Projection: State Plane Zone 6
Datum: NAD 83
Units: feet
Perris Valley CNDDB
Order, Common Name
1, long-spined spineflower
2, Payson's jewel-flower
3, thread-leaved brodiaea
4, burrowing owl
5, northern red-diamond rattlesnake
6, coastal California gnatcatcher
7, Stephens' kangaroo rat
8, coast horned lizard
9, orangethroat whiptail
10, Los Angeles pocket mouse
11, pocketed free-tailed bat
12, western mastiff bat
13, western yellow bat
Figure 6-11
Sensitive Species Occurrences and Habitats Within 2 Miles of Perris Valley Recycled Water Project
Riverside County, California

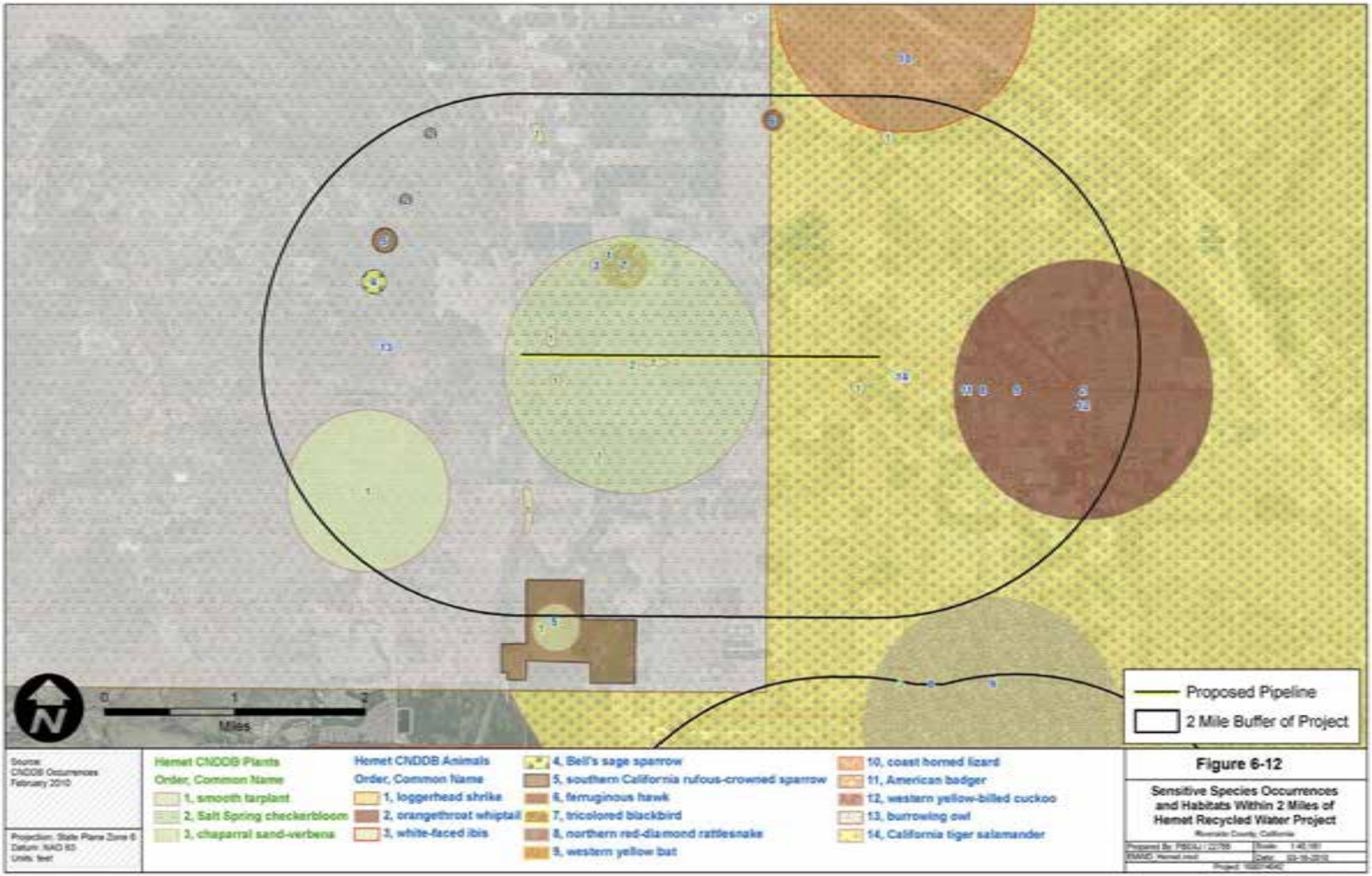


Figure 6-12

Sensitive Species Occurrences and Habitats Within 2 Miles of Hemet Recycled Water Project

Riverside County, California

Survey Results for Special-Status Plants, Animals, and Habitats

Diamond Valley Service Area

Recycled water pipelines of various diameters are proposed to be constructed within the ROWs of the following paved streets:

- South State Street;
- Chambers Street;
- South Lyon Avenue; and
- Pepper Tree Drive.

No special-status species, special-status habitats, designated critical habitats, or wetlands occur within the pipeline alignments of these paved roads.

Menifee Service Area

Recycled water pipelines of various diameters are proposed to be constructed within the ROWs of the following paved streets:

- Antelope Road;
- Junipero Road (paved section only);
- McCall Boulevard;
- Bradley Road; and
- La Piedra Road (paved section only).

No special-status species, special-status habitats, designated critical habitats, or wetlands occur within the pipeline alignments of these paved roads. The following alignments, with the exception of Bradley Road, traverse undeveloped land or unpaved roadways within the Menifee Service Area.

Bradley Road

While Bradley Road is a paved roadway, it was surveyed in greater detail along the western unpaved ROW margin where the road crosses Salt Creek (T5S, R3W, Sec. 33) because Salt Creek is a water of the United States. The pipeline crossing of the Salt Creek channel would be approximately 443 feet in length. An 18-inch pipeline would traverse the Salt Creek channel. Salt Creek at this location has been engineered for flood control and is channelized. Culverts extend under Bradley Road to pass minor streamflows. The elevation at the stream crossing is approximately 1,415 feet. Three soil types originally occupied the pipeline alignment prior to stream channelization: Domino silt loam, saline-alkali; Willows silty clay; and Willows silty clay, strongly saline-alkali. The profiles of these poorly drained, alluvial soils have been altered due to channel modification.

At the time of the survey, Salt Creek at Bradley Road was dry and the entire ROW had been treated with herbicide to eliminate all growing vegetation (Figures 6-13 and 6-14). As a consequence of ROW management activities, no special-status species, special-status habitats, designated critical habitats, or wetlands occur within the Bradley Road pipeline alignment. Several California ground squirrel (*Spermophilus beecheyi*) burrows were observed within the ROW, but there was no evidence of burrow use by the burrowing owl (*Athene cunicularia*).

La Piedra Road

La Piedra Road between Bradley Road and Haun Road is partially paved along the western pipeline alignment within the residential development between Bradley Road and Stern Drive (Figure 6-15). Approximately 2,342 feet of La Piedra Road between Stern Drive and Haun Road is currently an unpaved, compacted dirt roadway within which an 18-inch pipeline is proposed to be buried. The unpaved portion of La Piedra Road is designated as having a 100-foot wide ROW that will eventually be paved. Currently, the unpaved ROW is adjacent to a rural residential area and several agricultural parcels. The agricultural parcels have all been disced and at the time of the survey they supported no vegetation. The primary soil types crossed by the unpaved portion of La Piedra Road are: Porterville clay, moderately deep, 2 to 8 percent slopes; Buchenau silt loam, 2 to 8 percent slopes, eroded; Wyman loam, 2 to 8 percent slopes, eroded; and Yokohl loam, 2 to 8 percent slopes. These alluvial fan soils probably supported primarily coastal sage scrub vegetation before the vegetation was removed for agriculture. Neither the road ROW, nor the adjacent land parcels are in a cell group or cell designated under the WRCMSHCP. No special-status species, special-status habitats, designated critical habitats, or wetlands occur within the pipeline alignment along the unpaved portion of La Piedra Road.

Chambers Avenue

The undeveloped ROW for Chambers Avenue between Chatham Lane and Aspel Road extends parallel to an existing fence line bordered on both sides by historically disced agricultural land (Figure 6-16). During the survey the Chambers Avenue ROW had not been disced recently and was supporting annual grassland and forbs (Figure 6-17). A dirt road also paralleled the fence line but this road was outside of the ROW. Also parallel to the Chambers Avenue ROW (and possibly within the ROW), was a channelized, ephemeral water course beginning at a culvert under Aspel Road and disappearing into the storm drain system at Chatham Lane (Figure 6-18). This channel was dry. Buried partially within this drainage was a 12-inch diameter pipeline of unknown content or origin (Figure 6-19).

The proposed 12-inch recycled water pipeline to be buried in the Chambers Avenue ROW is approximately 1,868 feet in length. If this pipeline crosses the ephemeral drainage that parallels the fence line, it would have to be jack and bored or a California Department of Fish and Game Streambed Alteration Agreement (SAA) would be required. Similarly, compliance with the federal Clean Water Act, section 404, for the placement of any non-structural fill material could be accomplished under the U.S. Army Corps of Engineers' Nationwide Permit No. 18 for Linear Utility Projects.

Figure 6-13. Bradley Avenue pipeline ROW

Figure 6-14. Bradley Avenue culverts at Salt Creek crossing

Figure 6-15. La Piedra Road pipeline ROW

Figure 6-16. Chambers Avenue pipeline ROW

Fig. 6-17. Chambers Avenue pipeline ROW through agricultural field colonized by annual grassland

Figure 6-18. Chambers Avenue pipeline ROW at Aspel Road culvert

Fig. 6-19. Ephemeral drainage with existing 12-inch pipeline near Chambers Avenue Pipeline ROW

The Chambers Avenue pipeline alignment through the agricultural/grassland parcels ranges in elevation from approximately 1,490 to 1,520 feet. Two soil types will be crossed by the pipeline: Yohohl loam, 2 to 8 percent slopes; and Arbuckle loam, 2 to 8 percent slopes. Both of these soils developed on alluvial fans and probably naturally supported primarily coastal sage scrub vegetation. Currently, the vegetation along the ROW consists of numerous, largely exotic species (see Appendix C for a full list) dominated by rabbitfootgrass (*Polypogan monspeliensis*), canarygrass (*Phalaris* sp.), ripgut brome (*Bromus diandrus*), Madrid brome (*Bromus madritensis*), hair barley (*Hordeum leporinum*), storksbill (*Erodium botrys*), fiddleneck sp. (*Amsinckia* sp.), mustard (*Brassica* sp.), and lupine (*Lupinus* sp.). The pipeline would cross the ephemeral drainage at the intersection of Aspel Road. A small, relict willow riparian stand is located at this location. One or more specimens of black willow (*Salix goodingii*) would be impacted by pipeline construction. The invasive giant reed (*Arundo donax*) was also present in the willow stand. The willow stand which grows along the ephemeral channel would be classified as a palustrine wetland.

One California ground squirrel burrow was observed within the ROW, but there was no evidence of burrow use by the burrowing owl. The ROW and agricultural fields contained active and inactive Botta's pocket gopher (*Thomomys bottae*) burrows. Scat from rabbits (Leporidae) and coyote (*Canis latrans*) tracks were evident. Birds in the area observed included red-tailed hawk (*Buteo jamaicensis*), Brewer's blackbird (*Euphagus cyanocephalus*), American crow (*Corvus brachyrhynchos*), and western meadowlark (*Sturnella neglecta*) - all species typical of open agricultural grasslands.

Neither the Chambers Avenue ROW, nor the adjacent agricultural parcels are in a cell group or cell designated under the WRCMSHCP. No special-status species were observed to occur within the Chambers Avenue pipeline alignment ROW. There are no designated critical habitats in the area. The willow riparian stand/wetland is classified by the California Department of Fish and Game as a special-status habitat even though the functional value of this relict stand is low.

Junipero Road

Junipero Road is paved from McCall Boulevard to the end of the Boulder Ridge School property. The road is unpaved, compacted dirt from the school property north to Rouse Road, a distance of approximately 1,672 feet (Figure 6-20). A 12-inch pipeline is proposed to be constructed within the Junipero Road ROW from McCall Boulevard to Rouse Road. The unpaved portion of Junipero Road is about 1,460 feet in elevation with a slight slope to the north. The soils crossed by this road include: Exeter sandy loam, 2 to 8 percent slopes, eroded; Exeter very fine sandy loam, deep, 0 to 5 percent slopes; Exeter sandy loam, deep, 2 to 8 percent slopes, eroded; and Hanford coarse sandy loam, 2 to 8 percent slopes. These soils are all alluvial fan soils in origin that probably supported coastal sage scrub and grassland vegetation before being developed for agriculture. The entire unpaved portion of the Junipero Road pipeline alignment traverses land currently used for agriculture (Figure 6-21).

The Boulder Ridge School site contains a stormwater detention basin located at the northeastern corner of the school grounds (Figure 6-21). This detention basin supports wetland habitat and water is leaking beneath the detention basin to the roadside ditch parallel to Junipero Road. This leakage has resulted in

Figure 6-20. Junipero Road pipeline ROW

Figure 6-21. Junipero Road pipeline alignment through agricultural fields

the development of riparian and wetland vegetation along approximately 716 feet of Junipero Road (Figure 6-22). Runoff from the detention basin first parallels the western road margin ditch before crossing the road to the eastern margin roadside ditch and then recrossing back to the western margin ditch. The runoff appears to be following an historical drainage that has been virtually eliminated by agricultural development in the area.

At the time of the field survey the drainage was intermittent and no surface water was present. Willows (*Salix* sp), salt cedar (*Tamarix* sp.), cattails (*Typha* sp.), and mulefat (*Baccharis* sp.) were the primary overstory riparian species (see Appendix C for a complete list of flora observed). Wildlife species observed associated with this habitat included song sparrow (*Melospiza melodia*) , red-winged blackbird (*Agelaius phoeniceus*), California quail (*Callipepla californica*), hummingbirds (Trochilidae), Botta's pocket gopher, and old California ground squirrel burrows. No burrowing owls were observed using the ground squirrel burrows.

Depending on the final location of the pipeline alignment within the Junipero Road ROW, some portion of the riparian/wetland habitat would be impacted unless the leakage from the detention basin is eliminated or directed away from Junipero Road. Between approximately 353 and 716 feet of riparian/wetland habitat could be impacted by the pipeline, depending on the final alignment location (Figures 6-23 and 6-24). The California Department of Fish and Game considers this riparian/wetland habitat as special-status due to its wildlife value.

Neither the road ROW, nor the adjacent land parcels are in a cell group or cell designated under the WRCMSHCP. Notwithstanding the occurrence of riparian/wetland habitat along the unpaved portion of Junipero Road within an area converted to agriculture, no special-status species or designated critical habitats occur within the pipeline alignment along the unpaved portion of Junipero Road.

Rouse Road

Rouse Road between Junipero Road and Palomar Road is unpaved, compacted soil (Figure 6-25). This road section is approximately 1,336 feet in length. A 12-inch recycled water pipeline is proposed to be installed within the 118-foot wide ROW. Agricultural lands border both sides of the road, and there is no native vegetation present along the road (Figure 6-26). Similar alluvial soils to those found along Junipero Road also occur along Rouse Road: Exeter sandy loam, deep, 0 to 2 percent slopes; and Greenfield sandy loam, 0 to 2 percent slopes. Both soil types probably supported coastal sage scrub and grassland prior to agricultural conversion.

Neither the road ROW, nor the adjacent land parcels are in a cell group or cell designated under the WRCMSHCP. No special-status species, special-status habitats, designated critical habitats, or wetlands occur within the pipeline alignment ROW along Rouse Road.

Fig. 6-22 Junipero Road riparian/wetland habitat

Figure 6-23. Junipero Road pipeline alignment in relationship to riparian/wetland habitat

Figure 6-24. Junipero Road riparian/wetland habitat

Figure 6-25. Rouse Road pipeline ROW

Figure 6-26. Rouse Road pipeline ROW between agricultural fields

French Valley Service Area

Recycled water pipelines of various diameters are proposed to be constructed within the ROWs of the following paved streets:

- Pourroy Road.
- Benton Road;
- Cady Road;
- Thompson Road; and
- Maddalena Road.

No special-status species, special-status habitats, designated critical habitats, or wetlands occur within the pipeline alignments of these paved roads.

Moreno Valley-Perris North Service Area

Recycled water pipelines of various diameters are proposed to be constructed within the ROWs of the following paved streets:

- Indian Avenue;
- Nandina Avenue.
- Barrett Avenue; and
- West Perry Street

No special-status species, special-status habitats, designated critical habitats, or wetlands occur within the pipeline alignments of these paved roads.

A portion of PN-1 would traverse undeveloped land within the Moreno Valley-Perris North Service Area. This pipeline alignment is approximately 1,950 feet long and it traverses several agricultural parcels at an elevation of about 1,460 feet (Figure 6-27). The soil type within the proposed alignment is almost exclusively Exeter sandy loam, deep, 0 to 2 percent slopes. Prior to agricultural conversion this soil type probably supported a combination of coastal sage scrub and native grassland vegetation.

At the time of the field survey, the agricultural parcels south of West Perry Street had been planted to wheatgrass (*Elymus* sp.) (Figure 6-28). Several species of non-native plants occurred near the field margins (see Appendix C for a list of flora observed). North of West Perry Street was another agricultural field that had not been disced recently (Figure 6-29). This field contained primarily non-native grasses, storksbill, fiddleneck, and Russian thistle (Appendix C). The pipeline alignment did not contain any shrubs or trees, wetland areas, or other special-status habitats.

The recycled water pipeline alignment and the adjacent land parcels are not in a cell group or cell designated under the WRCMSHCP. No special-status species, special-status habitats, designated critical habitats, or wetlands occur within this alternative pipeline alignment.

Figure 6-27. Indian Avenue pipeline ROW

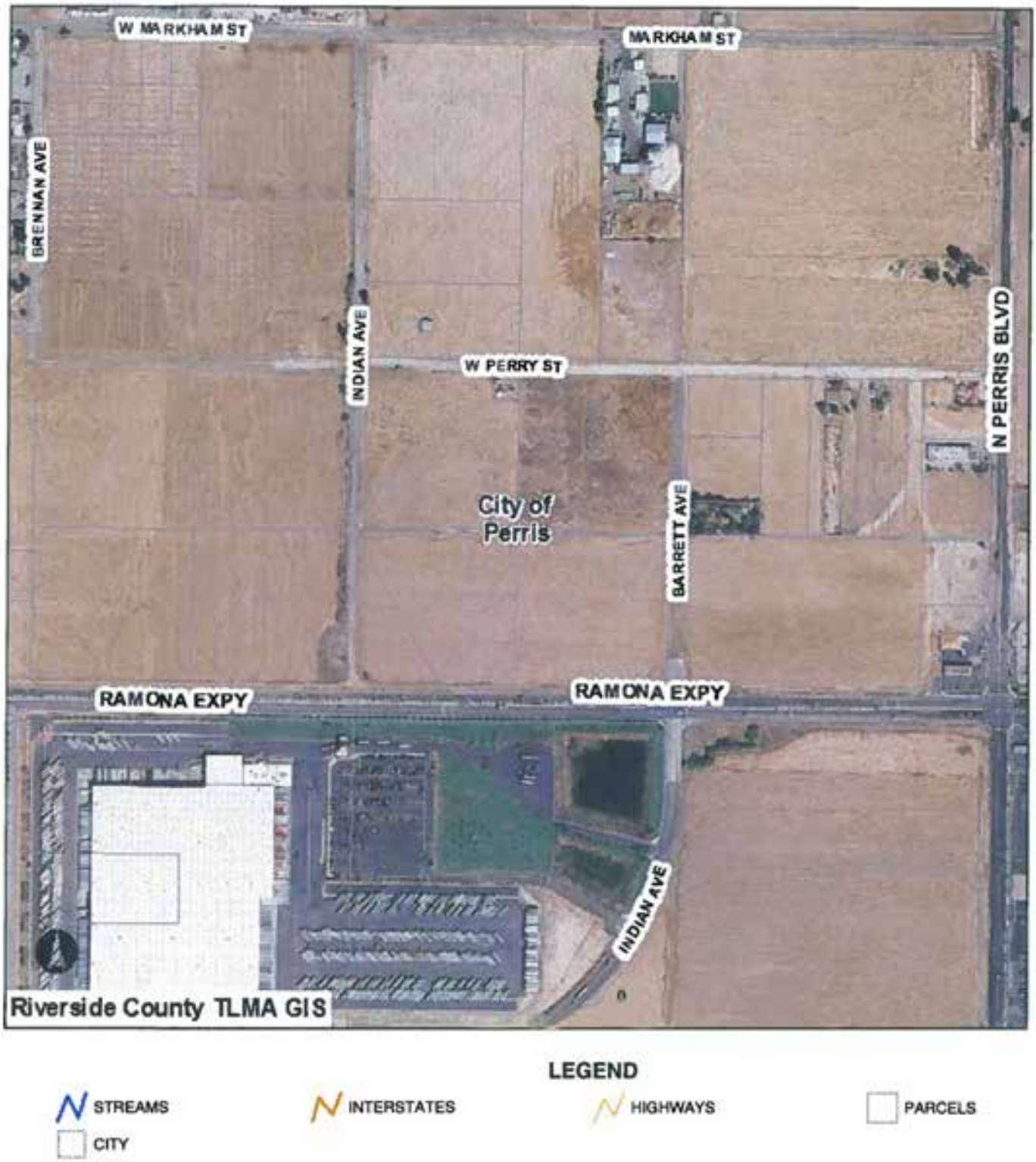


Figure 6-28. Indian Avenue pipeline ROW south of West Perry Street

Figure 6-29. Indian Avenue pipeline alignment north of West Perry Street

San Jacinto Service Area

Only one 12-inch recycled water pipeline is proposed for the San Jacinto Service Area. This pipeline is proposed to be located in the paved ROW of Cottonwood Avenue as shown previously on Figure 6-6.

No special-status species, special-status habitats, designated critical habitats, or wetlands occur within the pipeline alignment of this paved road.

Summary

No special-status flora or fauna were observed at the various recycled water pipeline alignments examined. Most alignments were within road ROWs that did not support suitable habitats for special-status species. Riparian/wetland habitats that could be impacted by pipeline construction were observed along the Chambers Avenue and Junipero Road alignments. No designated critical habitats would be impact by the proposed project. None of the proposed pipeline alignments or adjacent land parcels are within a cell group or cell designated under the WRCMSHCP.

Regulatory Setting

U.S. Fish and Wildlife Service

Endangered Species Act

Projects that would result in adverse effects on federally listed threatened or endangered species are required to consult with and mitigate through consultation with the U.S. Fish and Wildlife Service (USF&WS). The objective of consultation is to determine whether the project would impact a protected species or designated critical habitat, and to identify mitigation measures that would be required to avoid or reduce impacts to the species. This consultation can be pursuant to either Sections 7 or 10 of the Endangered Species Act (ESA). Section 7 consultation is required when a federal agency is involved in project approval, funding, or permitting. Section 10 consultation is required when no federal agencies are involved with the project.

The federal ESA of 1973[1] provides legal protection for plant and animal species in danger of extinction, and requires definitions of critical habitat and development of recovery plans for specific species. Section 7 of the ESA requires federal agencies to make a finding on the potential to jeopardize the continued existence of any listed species potentially impacted by all federal actions, including the approval of a public or private action. Section 9 of the ESA prohibits the take of any member of an endangered species. Take is defined in the ESA as "… to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." USF&WS has further defined the terms harass and harm. Harass is defined as follows:

[1] The federal Endangered Species Act of 1973, as amended (16 USC 1531 et seq.), Sections 7, 9, and 10.

> "… an intentional or negligent act or omission that creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavior patterns that include, but are not limited to, breeding, feeding, or sheltering."

Harm is defined as follows:

> "… significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering."

Section 10(a) of the ESA permits the incidental take of listed species if the take is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.

Section 3 of the ESA defines an endangered species as any species, including subspecies, in danger of extinction throughout all or a significant portion of its range. This section defines threatened species as any species "likely to become endangered within the foreseeable future throughout all or a significant portion of its range". Federally listed or "listed" indicates that a species has been designated as endangered or threatened through publication of a final rule in the *Federal Register*. Designated endangered and threatened species, listed under Section 4 of the ESA, receive the full protection of the ESA. Proposed endangered and threatened species are those for which a proposed regulation, but not a final rule, has been published in the *Federal Register.* Proposed species are granted limited protection, while candidate species and species of special concern are afforded no protection under the ESA.

Migratory Bird Treaty Act—1936

The Migratory Bird Treaty Act (MBTA) regulates or prohibits taking, killing, possession of, or harm to migratory bird species listed in Title 50 Code of Federal Regulations (CFR) Section 10-13. The MBTA is an international treaty for the conservation and management of bird species that migrate through more than one country and is enforced in the United States by the USF&WS. Hunting of specific migratory game birds is permitted under the regulations listed in Title 50 CFR 20. The MBTA was amended in 1972 to include protection for migratory birds of prey (raptors). Six families of raptors occurring in North America were included in the amendment:

- Accipitridae (kites, hawks, and eagles);
- Catharidae (New World vultures);
- Falconidae (falcons and caracaras);
- Pandionidae (ospreys);
- Strigidae (typical owls); and
- Tytonidae (barn owls).

All species and subspecies of the families listed above are protected under the amendment.

California Department of Fish and Game

California Endangered Species Act

The California Department of Fish and Game (CDFG) administers a number of laws and programs designed to protect fish and wildlife resources. Principal of these is the California Endangered Species Act of 1984 (CESA-Fish and Game Code Section 2050), which regulates the listing and take of state-endangered and state-threatened species. CESA declares that deserving species will be given protection by the state because they are of ecological, educational, historical, recreational, aesthetic, economic, and scientific value to the people of the state. CESA established that it is state policy to conserve, protect, restore, and enhance endangered species and their habitats.

Species listed under CESA cannot be taken without adequate mitigation and compensation. The definition of take under CESA is the same as described above for the federal ESA. However, based on findings of the California Attorney General's office, take under CESA does not prohibit indirect harm by way of habitat modification. Typically, CDFG implements endangered species protection and take determinations by entering into management agreements (Section 2018 Management Agreements) with project applicants.

CDFG maintains lists for Candidate-Endangered Species and Candidate-Threatened Species. California candidate species are given equal protection to the law as listed species have. CDFG also lists Species of Special Concern based on limited distribution, declining populations, diminishing habitat, or unusual scientific, recreational, or educational value. Species of special concern do not receive protection under the CESA or any section of the California Fish and Game Code and do not necessarily meet CEQA Guidelines Section 15380 criteria as rare, threatened, endangered, or of other public concern. Like federal species of concern, the determination of significance for California species of special concern must be made on a case-by-case basis. Designation of Species of Special Concern is intended by CDFG to be used as a management tool for consideration in future land use decisions.

Fish and Game Code – Sections 3503, 3503.5 and 3513

California Fish and Game Code Section 3503 states that it is unlawful to take, possess, or needlessly destroy the nests or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Fish and Game Code Section 3503.5 protects birds-of-prey (raptors) and their eggs and nests. Section 3513 states that it is unlawful to take or possess any migratory non-game bird as designated in the Migratory Bird Treaty Act. These regulations could require that elements of a proposed project (particularly vegetation removal or construction near nest trees) be reduced or eliminated during critical phases of the nesting cycle unless surveys by a qualified biologist demonstrate that nests, eggs, or nesting birds will not be disturbed, subject to approval by CDFG and/or USF&WS.

Fish and Game Code – Sections 3511, 4700, 5050, and 5515

California Fish and Game Code Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians) and 5515 (fish) designate certain species as "fully protected". Fully protected species, or parts thereof, may not be taken or possessed at any time, and no provision of the Code or any other law may be construed to authorize the issuance of permits or licenses to take any fully protected species. No such permits or licenses heretofore issued may have any force or effect for any such purpose, except that the California Fish and Game Commission may authorize the collecting of such species for necessary scientific research. Section 3511 of the Code may authorize the live capture and relocation of fully protected birds pursuant to a permit for the protection of livestock. Legally imported and fully protected species or parts thereof may be possessed under a permit issued by CDFG.

Streambed Alteration Agreements

Under sections 1600-1607 of the California Fish and Game Code, the CDFG regulates activities that would alter the flow, bed, channel, or bank of streams and lakes. The limits of CDFG's jurisdiction are defined in the code as the . . . "bed, channel or bank of any river, stream, or lake designated by the department in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit..." (Section 1601).

This broad definition gives the CDFG great flexibility in deciding what constitutes a river, stream, or lake. The CDFG defines streams under the jurisdictions of sections 1600-1607 as follows:

1. The term "stream" can include intermittent and ephemeral streams, rivers, creeks, dry washes, sloughs, blue-line streams [United States Geological Survey (USGS) maps], and water courses with subsurface flows. Canals, aqueducts, irrigation ditches, and other means of water conveyance can also be considered streams if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife.

2. Biological components of any stream may include aquatic and riparian vegetation, all aquatic animals including fish, amphibians, reptiles, invertebrates, and terrestrial species that derive benefits from the stream systems.

3. As a physical system, a stream not only includes water (at least on an intermittent or ephemeral basis), but also a bed or channel, a bank and/or levee, instream features such as logs or snags, and various floodplains depending on the return frequency of the flood event being considered.

4. The lateral extent of a stream can be measured in several ways depending on a particular situation and the type of fish and wildlife resource at risk. The following criteria are present in order from the most inclusive to the least inclusive:

    a. The floodplain of a stream can be the broadcast measurement of a stream's lateral extent depending on the return frequency of the flood event used. For most flood control purposes, the 100-year flood event is the standard measurement. However, because it

may include significant amounts of upland or urban habitat, in many cases the 100-year floodplain may not be appropriate.

b. The outer edge of riparian vegetation is generally used as the line of demarcation between riparian and upland habitats and is therefore a reasonable and identifiable boundary for the lateral extent of a stream. In most cases, the use of this criterion should result in protecting the fish and wildlife resources at risk.

c. Most streams have a natural bank which confines flows to the bed or channel except during flooding. In some instances, particularly on smaller streams or dry washes with little or no riparian habitat, the bank should be used to mark the lateral extent of a stream.

d. A levee or other artificial stream bank could also be used to mark the lateral extent of a stream. However, in many instances, there can be extensive areas of valuable riparian habitat located behind a levee.

In practice, the CDFG usually marks its jurisdictional limit at the top of the stream or bank, or at the outer edge of the riparian vegetation, whichever is wider.

Riverside County

Western Riverside County Multiple Species Habitat Conservation Plan

The Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) encompasses 1,966 square miles of western Riverside County including approximately 842,500 acres of unincorporated County land west of the crest of the San Jacinto Mountains to the Orange County line, as well as approximately 372,700 acres within the jurisdictional areas of cities. The MSHCP provides for the creation of a conservation area that protects and manages 500,000 acres of habitat for covered species (146 species). The MSHCP provides for habitat conservation, species protection and management, program costs, and development certainty to the County and cities; State and federal wildlife agencies; development, agriculture, and environmental communities; and the public at large. The goal of the MSHCP is to target the highest quality habitats for preservation, while allowing development of less important habitat areas.

Riverside County Ordinance No. 663.10, Stephens' Kangaroo Rat Mitigation Fee Ordinance

The purpose of this ordinance is to finance the preparation, development and implementation of a Habitat Conservation Plan, including the acquisition of habitat reserve sites, and the application for a Section 10(a) permit under the Federal Endangered Species Act of 1973. It is the further purpose of this ordinance to provide a method for mitigation of impacts to the Stephens' Kangaroo Rat caused by the loss of its habitat due to development during the preparation and implementation of a Habitat Conservation Plan and provide for habitat mitigation to be identified in the Habitat Conservation Plan. Mitigation of impacts to the Stephens' Kangaroo Rat will be accomplished through the review of each

proposed development project within the Fee Assessment Area to determine whether on-site mitigation through the reservation or addition of lands included within or immediately adjacent to a potential habitat reserve site or payment of the Mitigation Fee or a combination of both is appropriate and furthers the ultimate Habitat Conservation Plan objectives. A proposed development project may be referred, for review, to Federal and State resource agencies based upon criteria which may be established and agreed upon by the County and said agencies.

This ordinance provides for the establishment of this review process and satisfaction of on-site mitigation to protect potential habitat reserve sites or payment of the Mitigation Fee or a combination of both, which upon implementation will satisfy U.S. Fish and Wildlife Service, California Department of Fish and Game, as well as County mitigation requirements for the Stephens' Kangaroo Rat and its habitat which may occur within the unincorporated areas of the County designated herein.

Data used for this section were obtained from various sources including the California Natural Diversity Data Base and Western Riverside Multiple Species Habitat Conservation Plan. Full bibliography entries for all reference material are contained at the end of this section.

Environmental Impact Analysis

Threshold Criteria

The following thresholds of significance are based on Appendix G of the 2009 State CEQA Guidelines. For purposes of this EA/DEIR, implementation of the proposed project may have a significant adverse impact if it would result in any of following:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.
- 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.
- 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.
- 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.

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan.

Environmental Analysis

Potential Impact. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.

Based on literature searches, analysis of aerial photographs and field studies, there are no special-status species that would be impacted by implementation of the Recycled Water Distribution Pipeline Expansion Project.

Significance of Impact:

No impact.

Mitigation Measures:

None required.

Potential Impact. 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.

As previously stated in the Environmental Setting section, there is a small, relict willow riparian stand along the ephemeral channel near its intersection with Aspel Road (Pipeline M-2, Chambers Avenue). One or more specimens of black willow (*Salix goodingii*) would be impacted by pipeline construction. The invasive giant reed (*Arundo donax*) was also present in the willow stand. The willow stand which grows along the ephemeral channel at this location would be classified as a palustrine wetland.

Also as previously stated in the Environmental Setting section, the Boulder Ridge School site contains a stormwater detention basin located at the northeastern corner of the school grounds. This detention basin supports wetland habitat and water is leaking beneath the detention basis to the roadside ditch parallel to Junipero Road. This leakage has resulted in the development of riparian and wetland vegetation along approximately 716 feet of Junipero Road. Runoff from the detention basin first parallels the western road margin ditch before crossing the road to the eastern margin roadside ditch and then recrossing back to the western margin ditch. The runoff appears to be following an historical drainage that has been virtually eliminated by agricultural development in the area.

At the time of the field survey the drainage was intermittent and no surface water was present. Willows (*Salix* sp), salt cedar (*Tamarix* sp.), cattails (*Typha* sp.), and mulefat (*Baccharis* sp.) were the primary overstory riparian species observed. Wildlife species observed associated with this habitat included song sparrow (*Melospiza melodia*), red-winged blackbird (*Agelaius phoeniceus*), California quail (*Callipepla californica*), hummingbirds (Trochilidae), Botta's pocket gopher, and old California ground squirrel burrows. No burrowing owls were observed using the ground squirrel burrows.

Depending on the final location of the pipeline alignment within the Junipero Road ROW, some portion of the riparian/wetland habitat could be impacted unless the leakage from the detention basin is eliminated or directed away from Junipero Road. Between approximately 353 and 716 feet of riparian/wetland habitat may be impacted by the pipeline, depending on the final alignment location. The California Department of Fish and Game considers this riparian/wetland habitat as special-status due to its wildlife value.

Once these two alignments are finalized, it might be necessary for EMWD to obtain a Streambed Alteration Agreement from the California Department of Fish and Game and coverage under Nationwide Permit No. 18 from the U.S. Army Corps of Engineers before construction can occur at these two locations. The regulatory requirements of the Streambed Alteration Agreement and the Nationwide Permit No. 18 would be adequate to reduce any potential impacts to these two riparian/wetland areas to a less than significant level.

Significance of Impact:

Less than significant impact.

Mitigation Measures:

None required.

Potential Impact. 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.

See the above discussion under riparian impacts.

Significance of Impact:

No impact.

Mitigation Measure:

None required.

Potential Impact. 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 proposed Project would not interfere with any migratory activities or impact migratory corridors because there are none in the Project area. Reviews of General Plans and the MSHCP show no active habitat linkages or corridors, habitat does not support such linkages, and no nursery sites exist within the Project area. In addition, all project facilities would be underground recycled water pipelines.

Significance of Impact:

No impact.

Mitigation Measure:

None required.

Potential Impact. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

The proposed Project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. No other ordinances are in place that would apply to the proposed Project.

Significance of Impact:

No impact.

Mitigation Measure:

None required.

Potential Impact. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan.

As shown above, implementation of the proposed project would not conflict with the provisions of the Western Riverside County Multiple Species Habitat Conservation Plan.

Significance of Impact:

No Impact.

Mitigation Measure:

None required.

References

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7 Cultural Resources

Environmental Setting

Ethnography

Cahuilla Territory

The northern Project area is within the area controlled, at the time of Spanish and Euro-American contact by the Cahuilla. The name is of uncertain origin but probably a corruption of a word from the Cahuilla language. Like many California Indian groups defined primarily by ethnographers on the basis of language, the Cahuilla probably did not have a specific word referring to the whole population now known as Cahuilla. The fact that many modern Cahuilla do not prefer this term for referring to themselves reflects this situation. The language is part of the Cupan group of the Takic subfamily of the Uto-Aztecan family (Bean 1978:375).

Cahuilla territory covered a very large area in the central portion of southern California, but much of their territory was desert that was very lightly used with few permanent villages. This is not to say that the more arid zones were not used. The Cahuilla exploited every useful source of food and other resources to derive a living from their environment.

Villages were located in canyons or on alluvial fans with availability of reliable water being a very important consideration in location. The residents of the village were normally family groups that "owned" the resources around the villages in common. The vast open areas beyond the range of the villages' control were available to anyone. When important food sources were ripe, particularly acorns, the villages were almost deserted as the occupants moved into the groves for the duration of the harvest.

The primary contribution of the men to subsistence was hunting. A variety of techniques were used for this appropriate to the terrain and the intended prey. The women were primarily responsible for harvesting and processing vegetable foods. One advantage the Cahuilla had in this area was the wide variation in elevation available in their territory. This led to a considerable variety of useful plants that matured at various times of year. This allowed a more even supply of food as opposed to the "feast or famine" pattern often associated with desert dwellers. This was also aided by Cahuilla technology, which included construction of granaries, various approaches to preservation by drying and sealing foodstuffs in pottery jars.

The Cahuilla were basically a small population spread over a very large territory. The splintering effect of this was counteracted by political organization and elaborate ceremonial interconnections. This allowed the scattered village units to act in concert in an emergency, such as an attack by occasionally warlike neighbors. The partilineal lineage that occupied a village recognized close interrelationships with up to ten other lineages, forming a clan. The clan would operate together for defense, in major rituals and in important harvesting activities. One lineage was recognized as the founding lineage of the clan and often controlled the office of ceremonial leader and the ceremonial house structure would be

in their village. The village chiefs held an administrative position that combined and controlled religious, economic, and warfare powers. The village chief also supervised specific areas for group hunting and gathering. The produce from these areas was under the chief's control and was used for public occasions. This position was normally hereditary. In turn, each Cahuilla was either a Wildcat or a Coyote, the partilineal moieties that cross-cut the clan structure and further cemented the Cahuilla together as a socio-political entity (Bean1978:578-581).

Older men were most active in rituals and ceremonial affairs. They created most of the ceremonial paraphernalia used by the tribe. While the chief controlled religious powers, he had an assistant who had important ritual duties and an advisory council of ritual specialists and shamans. These shamans each had his own special area of knowledge about the environment or ritual magic. These positions were hereditary with each man training his own successor from his own lineage who showed the proper innate abilities. Because shamans were held in great awe, they exercised de facto political power as well. In contrast to many Californian tribes, the healers in Cahuilla society were not shamans and were, in fact, normally women who learned healing techniques from their mothers and earned reputations as effective curers.

Luiseño Territory

The southern Project area is within the Luiseño territory. The Luiseño territory encompasses approximately 1,500 square miles of coastal southern California. Along the coast it extended from about Agua Hedionda Creek on the south to near Aliso Creek on the northwest. The boundary extended inland to Santiago Peak, then southward to the east of Palomar Mountain, then around the southern slope above the valley of San Jose. From this point the boundary turned west and returned to the sea along the Agua Hedionda Creek *(Bean and Shipet, 1978 in K.S. Dunbar & Associates, Inc., February 2003).*

Sedentary and autonomous village groups had specific hunting, collecting, and fishing areas that were located in diverse ecological zones. Typically these zones were in valley bottoms, along streams, or along coastal strands near mountain ranges. Villages were usually in sheltered coves or canyons, on the side of slopes in a warm thermal zone, near good water supplies, and in defensive locations. Each village was a clan tribelet, a group of people partrilineally related who owned an area in common and who were politically and economically autonomous from neighboring groups. The village chiefs held an administrative position that combined and controlled religious, economic, and warfare powers. The village chief also supervised specific areas for group hunting and gathering. The produce from these areas was under the chief’s control and was used for public occasions. This position was hereditary *(Bean and Shipet, 1978 in K.S. Dunbar & Associates, Inc., February 2003).*

The Luiseño shared boundaries with the Cahuilla, Cupeño, Ipai, and Gabrielino peoples but they tended to isolate themselves unless they were expanding which they did through warfare and marriage. Their neighbors considered them dangerous and warlike expansionists. This view was confirmed by their highly developed warfare structure that included a warrior class *(Bean and Shipet, 1978 in K.S. Dunbar & Associates, Inc., February 2003).*

The main source of food for the Luiseño included deer, rabbit, jackrabbit, woodrat, mice and ground squirrels, antelope, valley and mountain quail, doves, ducks, and other birds. Coastal marine foods included sea mammals, fish, crustaceans, and mollusks, especially abalone. Trout and other freshwater fish were caught in mountain springs. In addition to animal food sources, the Luiseño also relied on six species of acorns and numerous varieties of seeds including manzanita, sunflower, and sage among others. To add to the staple crop of seeds, they also collected bulbs, roots, cactus pods, and various fruits such as wild strawberries, grapes and elderberries *(Bean and Shipet, 1978 in K.S. Dunbar & Associates, Inc., February 2003).*

Older men were most active in rituals and ceremonial affairs. They created most of the ceremonial paraphernalia used by the tribe. While the chief controlled the religious powers, he had an assistant who had important ritual duties and an advisory council of ritual specialists and shamans. These shamans each had their own special area of knowledge about the environment or ritual magic. These positions were hereditary with each man training his own successor from his own lineage who showed the proper innate abilities. These specialists were also members of the cultic organization of Chingichngish and shared special access to ritual and supernatural power forms. In addition to these spiritual roles, the shamans also had ritualistic tools including soapstone or clay pipes for smoking, purification, and sucking disease rituals *(Bean and Shipet, 1978 in K.S. Dunbar & Associates, Inc., February 2003).*

History

Very little of the historic development of Riverside County has had a direct effect on the project areas. The establishment of Mission San Luis Rey had some effect on the Diamond Valley vicinity because Rancho San Jacinto Viejo was owned by the mission at one time.

Beginning around 1820, the mission established a cattle ranch in the Valley, which they named for St. Hyacinth (San Jacinto in Spanish). In 1834, after California had passed from Spanish to Mexican rule, the Mission San Luis Rey was taken over by the government, and its lands granted to private individuals. In 1842, José Antonio Estudillo was granted the 35,500-acre Rancho San Jacinto Viejo (Old San Jacinto), which took in most of the Valley. José Estudillo died in 1852, but his family continued to own most of the Valley until the early 1880s. Two of his sons built two-story brick mansions in 1885 - 1886. Francisco Estudillo was San Jacinto's first Postmaster (1870), second mayor (1890), and served as the local Indian Agent for the Federal Government in the 1890s.

After the Estudillo lands were broken up a group of Los Angeles investors organized the San Jacinto Land Association, which acquired some 15,000 acres of the old ranch. In 1883, they laid out a new San Jacinto to rival the old town site less than two miles away.

The competition ended in 1888, when the Santa Fe railroad built a branch line into the Valley from Perris, which terminated on the west side of "New" San Jacinto. "Old" San Jacinto was far from the tracks and eventually faded away. The new City of San Jacinto was incorporated that same year, on April 9, 1888.

By the 1870s, the local economy had moved from cattle ranching to horticulture. Early ranchers had grown grain but apricots, walnuts and citrus came to dominate the agricultural production. Turkey ranching and dairy farming came later. Besides agriculture, several local lime kilns added to the local economy before World War I.

The Menifee project area is more isolated. There has been ranching and agriculture in the area since the mid 1880s, but this has been primarily in the Menifee Valley, where water is available. The tank site is peripheral to the valley. The area was named after Luther Menifee Wilson, who operated a successful quartz mine in the 1880s, leading to establishment of a post office in 1887. Agriculture has since expanded greatly with development of a regional irrigation system.

The relatively recent agricultural development of the area is reflected in the project area by the Mercer Ranch. The remains of the ranch buildings are a recorded resource in the project area, but primarily south of the impact areas. The ranch was established by Edward Mercer in 1919, but did not reach its full extent until acquired by Benjamin Cunningham in 1959. Cunningham's headquarters were on another part of the property, so he razed the Mercer Ranch buildings in the early 1960s.

The first recorded entry by Europeans into the Temecula Valley was in 1797 when Father Juan Norberto de Santiago, seven soldiers, and five Native Americans, in search of a site for a new mission, entered the valley from the north and encamped along the shores of Lake Elsinore. In his journal is the first recording of the name Temecula, for the village on the shores of Lake Elsinore where he and his companions camped. The word Temecula may be a loose translation of the Luiseño phrase for "diffuse sunshine", or may be the Spanish translation for the village where they camped.

Record Searches

A review of records maintained by the Eastern Information Center of the California Historical Resources Information System was completed by center staff on March 2, 2010 (Appendix D). Due to a mapping error an addendum record search had to be conducted for a portion of the project alignment that was omitted from the original record search request. This report is also in Appendix D.

The record searches revealed that almost all of the Project area has already been examined by qualified archeologists for the presence of cultural resources. The bulk of the field inspections had involved large area surveys of properties adjacent to the current project elements, usually for proposed subdivisions, rather than surveys focused on the roadways. However, because the only way to determine if there might be resources extending under the roadway is to examine adjoining open land, this is actually an advantage in this case. A summary of the record searches for individual project areas follow.

Diamond Valley

The areas south of Pepper Tree Drive (Eckhardt and Canico 1978) and south of Chambers Street and west of State Street (Drover 1968; Romano and Robinson 1994) have been surveyed as well as a small section east of State Street. No sites have been recorded in this area. A small section on Chambers

Street east of State Street has not been surveyed, but there is a modern subdivision on the south and flat, former agricultural land on the north. It is not a sensitive area.

Menifee

All Project elements have been surveyed on at least one side except for a half mile of pipeline on the current and future alignment of Chambers Avenue (not the Chambers Street in the Diamond Valley project element.) Much of this has a new subdivision on the south side and all of the north side is open flat agricultural land. There are no rock exposures in this area that might have grinding slicks or petroglyphs.

The only recorded site in the Project vicinity is P-33-015743, the San Jacinto Valley Railroad. The far northern end of the Project touches the railroad, which is the same as the modern railroad mainline in this area.

Surveys were performed by: Bodmer et al. 2008; Bouscaren and McCarthy 1984; Cooley 2008; Drover 1989a, 1989b, 2003; Hogan and Tang 2008a; Smith and Buysse 2002; and Tang et al. 2003.

French Valley

Portions of this Project element were the subject of the addendum record search. There is no portion of the proposed Project area that has not had adjacent surveys. There are two recorded sites in the Project vicinity, both Euro-American. P-33-011233 is a small section of rock retaining wall along Winchester Road near the northern end of a proposed pipeline. P-33-016991 is the site of the former Alamos School, depicted on the modern USGS map. This site is located south of Benton Road.

Relevant surveys include: Collins and Smith 2006; Cooley and Patterson 2008; de Barros 2007; Delu and Reynolds 2000; Demack and Velechovsky 2002; Dice 2004; Drover 1990a, 1990b; and Keller 1991.

Moreno Valley/Perris North

There is no portion of the proposed Project area that has not had adjacent surveys. Portions of the Project area have been covered by: Clifford and Smith 2005; Harrison 2003; Love and Tang 1999; McCarthy 1987; McKenna 2005; Sanka 2007; Tang et al. 2007; and White and White 2006.

No cultural resources have been recorded near this Project element.

San Jacinto

All of this Project element has been surveyed, including a survey of Cottonwood Avenue, the only street involved in this Project element (Wells 1975). The only recorded site is the Reflection Lake RV Park (P-33-015741) located south of Cottonwood and called Cottonwood Lake on the modern USGS map. There

are several other surveys adjacent to the alignment (Arkush 1990, Clowery-Moreno and Smith 2007; Demack 2006; Hogan and Tang 2008b; Hunt et al. 2005; Smallwood and Shaker 2008).

Native American Heritage Commission

The Native American Heritage Commission was contacted by Peak & Associates, Inc., to request a review of its Sacred Lands File, and to provide the names of individuals and/or organizations in the area that may have knowledge concerning cultural resources in the Project vicinity. Its reply indicates that no resources contained in the Sacred Lands File exist within the Project area (Appendix D).

Environmental Impact Analysis

Threshold Criteria

The following thresholds of significance are based on Appendix G of the 2009 State CEQA Guidelines. For purposes of this EA/DEIR, implementation of the proposed project may have a significant adverse impact if it would result in any of following:

- Cause a substantial adverse change in the significance of a historical resource, as defined in §15064.5 of the State CEQA Guidelines.
- Cause a substantial adverse change in the significance of an archeological resource, pursuant to §15064.5 of the State CEQA Guidelines.
- Directly or indirectly destroy a unique paleontological resource or site, or unique geologic feature.
- Disturb any human remains, including those interred outside of formal cemeteries.

Environmental Analysis

Potential Impact. Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5 of the State CEQA Guidelines.

There are no known historical resources known along the proposed pipeline alignments that would be impacted by implementation of the proposed Project.

Significance of Impact:

No impact.

Mitigation Measure:

None required.

Potential Impact. Cause a substantial adverse change in the significance of an archeological resource as defined in § 15064.5.

There are no known archeological resources known along the proposed pipeline alignments. Although there were no archeological resources as defined in §15064.5 of the State CEQA Guidelines identified within or immediately adjacent to the proposed pipeline alignments, there is always a possibility that buried cultural resources that were not previously identified could be unearthed during excavation activities thus leading to a potentially significant impact.

Significance of Impact:

Potentially significant.

Mitigation Measures:

EMWD should include the following mitigation measure in its construction contract documents for all sites:

- If inadvertent discoveries of cultural resources are encountered at any time during construction, construction personnel shall avoid altering these materials and their context until a qualified archeologist has evaluated the situation and contacted the State Office of Historic Preservation and the closest Indian Tribe to the Project. Project personnel shall not collect or retain cultural resources. Prehistoric resources include, but are not limited to: chert or obsidian flakes; projectile points; mortars and pestles; dark, friable soil containing shell and bone; dietary debris; heat-affected rock; or human burials. Historic resources include stone or adobe foundations or walls; structures and remains with square nails; and refuse deposits (glass, metal, wood, ceramics), often found in old wells and privies.

Potential Environmental Effects of Measures

All physical improvements or activities that could result in changes to the physical environment required by these mitigation measures would be located within areas evaluated elsewhere in this EA/DEIR. The impacts of implementing such measures, if any, would be similar to those identified for the project in Sections 3 through 18 of this EA/DEIR.

Level of Significance After Mitigation:

Less than significant.

Potential Impact. Directly or indirectly destroy a unique paleontological resource or site or unique geological feature.

It is possible that paleontological resources could be unearthed during excavation activities thus leading to a potentially significant impact.

Significance of Impact:

Potentially significant.

Mitigation Measure:

EMWD should include the following mitigation measure in its construction contract documents:

- If paleontological resources (e.g., fossils) are encountered at any time during construction of the project, construction personnel shall avoid altering these materials and their context until a qualified paleontologist has evaluated the situation. Project personnel shall not collect or retain paleontological resources

Potential Environmental Effects of Measures

All physical improvements or activities that could result in changes to the physical environment required by these mitigation measures would be located within areas evaluated elsewhere in this EA/DEIR. The impacts of implementing such measures, if any, would be similar to those identified for the project in Sections 3 through 18 of this EA/DEIR.

Level of Significance After Mitigation:

Less than significant.

Potential Impact. Disturb any human remains, including those interred outside of formal cemeteries.

No human remains, including formal cemeteries were identified within or immediately adjacent to the proposed project alignments. However, it is always possible that unmarked burials could be unearthed during excavation activities.

Significance of Impact:

Potentially significant.

Mitigation Measure:

EMWD should include the following mitigation measure in its construction contract documents:

- In the event of an accidental discovery or recognition of any human remains, the County Coroner shall be notified and construction activities at the affected work site shall be halted. If the remains are found to be Native American, the Native American Heritage Commission shall be notified within 24 hours. The NAHC must identify a Most Likely Descendant(s) under Public Resources Code §5097.98 within 48 hours of receiving such notification. Guidelines of the Native American Heritage Commission shall be adhered to

in the treatment and disposition of the remains in accordance with the provisions of Health and Safety Code §7050.5 and Public Resources Code §5097.98.

Potential Environmental Effects of Measures

All physical improvements or activities that could result in changes to the physical environment required by these mitigation measures would be located within areas evaluated elsewhere in this EA/DEIR. The impacts of implementing such measures, if any, would be similar to those identified for the project in Sections 3 through 18 of this EA/DEIR.

Level of Significance After Mitigation:

Less than significant.

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8 Geology and Soils

Environmental Setting

The major geologic features of the greater Project area are the San Jacinto fault zone in the northeast and the Perris Block between the Elsinore and San Jacinto fault zones. The entire Project area is within the Peninsula Ranges of Southern California and the Southern California batholith.

The San Jacinto Graben is bounded by the Casa Loma and Claremont branches of the San Jacinto fault system. Faulting is filled with alluvium on faulted blocks and the alluvium is cut by the faults. Lenses of gravel, sand, clay and silt have been formed by the deposit of alluvial material. The lenses are interspersed with wood, gas and boulders. Studies have shown that sediment filled the graben to depths of at least 8,400 feet.

The Perris Block separates the San Jacinto and Elsinore faults. It is sculptured by five erosional surfaces and a deep valley system exists. It is a relatively stable block of cretaceous and older crystalline rock. Crystalline rocks show traces of small amounts of groundwater in the weathered zones near the surface and deeper in the fractures of the rocks.

The San Jacinto fault zone is considered one of the most active fault zones in Southern California. The San Jacinto, Claremont, Casa Loma, and Park Hill faults are part of the San Jacinto fault zone. The San Jacinto fault zone's future credible earthquake is magnitude 7.5 on the Richter scale.

The maximum credible earthquake on the Elsinore fault is estimated to be a magnitude 7.0 on the Richter scale.

Both the Elsinore and San Jacinto fault zones are part of the greater San Andreas fault system. The maximum credible earthquake on the San Andreas fault is estimated to be a magnitude 7.5 on the Richter scale.

The California Geological Survey has predicted ground motions (10 percent probability of being exceeded in 50 years) for the project area as a fraction of the acceleration due to gravity (g). The predicted ranges of values of ground motion are shown below. Shown are peak ground acceleration (Pga), spectral acceleration (Sa) at short (0.2 second) and moderately long (1.0 second) periods. Ground motion values are also modified by the local site soil conditions. Each ground motion value is shown for three different site conditions: firm rock (conditions on the boundary between site categories B and C as defined by the building code), soft rock (site category C), and alluvium (site category D).

Ground Motion	Firm Rock	Soft Rock	Alluvium
Pga	0.397/0.894	0.392/0.894	0.431/0.894
Sa 0.2 sec	0.971/2.123	0.967/2.123	1.062/2.123
Sa 1.0 sec	0.381/0.839	0.463/0.948	0.553/1.094

Soils

There are numerous soils types within the greater Project area, mostly of which are granitic in origin.

Data used for this section were obtained from various sources. Full bibliographical entries for all reference material are contained at the end of this section.

Environmental Impact Analysis

Threshold Criteria

The following thresholds of significance are based on Appendix G of the 2009 State CEQA Guidelines. For purposes of this EA/DEIR, implementation of the proposed Project may have a significant adverse impact if it would result in any of following:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: 1) 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; 2) strong seismic ground shaking; 3) seismic-related ground failure including liquefaction; or 4) landslides.

- Result in substantial soil erosion or the loss of topsoil.

- 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.

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

- 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.

Environmental Analysis

Potential Impact: Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: 1) 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; 2) strong seismic ground shaking; 3) seismic-related ground failure including liquefaction; or 4) landslides.

1. The Alquist-Priolo Earthquake Fault Zoning Act identifies special study zones for areas where existing known faults are located. The main purpose of the Act is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The Act also required the State Geologist to establish regulatory zones (known as Earthquake Fault Zones) around the surface traces of active faults and to issue appropriate maps. There is one Alquist-Priolo fault in the immediate Project area (San Jacinto) that would be crossed by the recycled water line in Cottonwood Avenue just east of Sanderson Avenue. This seismic condition can be mitigated by special design using reasonable construction and/or maintenance practices common to the Riverside County area. There are several other faults in the greater Project area but no others would be crossed by the proposed pipelines. Therefore, the seismic-related impacts regarding Alquist-Priolo faults would be less than significant.

2. As stated above, the Project area lies in one of the most seismically active zones in southern California. Northwest trending faults comprising the Elsinore Fault Zone and the San Andreas Fault Zone dominate the structural geology of the area. As previously stated, the California Geological Survey has predicted ground motions (10% probability of being exceeded in 50 years) as a fraction of the acceleration due to gravity (g) in the greater project area. These seismic conditions can be mitigated by special design using reasonable construction and/or maintenance practices common to the Riverside County area. Therefore, the seismic-related impacts would be less than significant.

3. The potential for liquefaction depends upon potential ground movement during seismic events, soil conditions, and depth to groundwater. These seismic conditions can also be mitigated by special design using reasonable construction and/or maintenance practices common to the Riverside County area. Therefore, the seismic-related impacts would be less than significant.

4. Based on field reconnaissance trips, there were no landslides noted in the Project area. Therefore, it is not anticipated that the Project would impact landslides nor does the Project have the potential to create or generate landslides.

Significance of Impact:

Less than significant.

Mitigation Measure:

None required.

Potential Impact. Result in substantial soil erosion or the loss of topsoil.

Construction activities would disturb several acres of soil that would result in the potential for wind and water erosion. Provisions of the appropriate Permit for Discharges of Storm Water Associated with Construction Activity administered by the California Regional Water Quality Control Board, Santa Ana and San Diego Regions would be complied with. Compliance with these permits would reduce the impacts to a level of less than significant as it would require the use of best management practices such as:

- Prohibit clearing and grading activities until a firm construction schedule is known.
- Stabilize all construction site soils with erosion control measures such as silt fences, matting, etc.
- Control dust during construction by frequent watering.
- Compact disturbed areas as soon as possible.

Significance of Impact:

Less than significant.

Mitigation Measure:

None required.

Potential Impact. 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 landslides, lateral spreading, subsidence, liquefaction or collapse.

The Project sites are not 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 an on-site or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.

Significance of Impact:

Less than significant.

Mitigation Measure:

None required.

Potential Impact. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.

The Project sites are not located on expansive soil as defined in Table 18-1-B of the Uniform Building Code.

Significance of Impact:

Less than significant.

Mitigation Measure:

None required.

Potential Impact. 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.

There are no on-site wastewater disposal facilities required as part of the Project.

Significance of Impact:

Less than significant.

Mitigation Measure:

None required.

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9 Hazards and Hazardous Materials

Environmental Setting

Hazards

Hazards are defined as natural and man-made conditions that must be respected if life and property are to be protected as growth and development occur. These hazards include seismic and other geologic hazards, fire and flooding. These hazards are explained in more detail in the following paragraphs.

Seismicity

As stated previously, the Project area lies in one of the most seismically active zones in Southern California. Northwest trending faults comprising the San Jacinto, San Andreas and Elsinore Fault Zones dominate the structural geology of the area. As described in Chapter 8, the maximum credible earthquakes associated with these three faults range from 7.0 to 7.5.

Liquefaction

The liquefaction potential at the Project sites ranges from low to moderate.

Slope Instability and Erosion

The project sites are essentially level; therefore, the potential for erosion is low.

Fire

Wildland fires are not a significant concern at the project sites.

Flooding

The pipelines would all be underground; therefore, flooding is not an issue.

Hazardous Materials

Several standard environmental record services are available to determine the potential for recognized environmental conditions in an area. Those databases are briefly described in the following paragraphs.

National Priorities List (NPL)

The National Priorities List (NPL) is a federal database of uncontrolled hazardous waste sites that warrant further investigation to determine if long-term "remedial action" is necessary. There are no NPL sites located in the immediate vicinity of the project sites.

Envirostor

Envirostor is a database maintained and primarily used by the California Department of Toxic Substances Control to determine the location of all hazardous waste sites. There are no sites listed in Envirostor located in the vicinity of the project sites.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), commonly known as Superfund, was enacted by Congress on December 11, 1980. In implementing this law, the Environmental Protection Agency (EPA) compiles a list of known hazardous waste sites that are under consideration for the Superfund list. This list is known as the CERCLIS database. There are no CERCLIS sites located in the immediate vicinity of the project sites.

Resource Conservation and Recovery Act (RCRA)

The primary goals of the Resource Conservation and Recovery Act (RCRA) are to protect human health and the environment from the potential hazards of waste disposal, to conserve energy and natural resources, to reduce the amount of waste generated, and to ensure that wastes are managed in an environmentally sound manner. In implementing this law, EPA compiles a list of known hazardous waste generators. There are no known hazardous waste generators within the immediate vicinity of the project sites.

Hazardous Materials Response Plans and Inventory

The Governor's Office of Emergency Services (OES) administers the Hazardous Materials Response Plans and Inventory program (Article 1, Chapter 6.95, Health and Safety Code) As part of this program, OES maintains a database of all hazardous materials spills in the State (RIMS). According to that database, there have not been any hazardous materials spills within the immediate vicinity of the project sites.

Leaking Underground Storage Tank Information System (LUSTIS)

The State Water Resources Control Board (SWRCB) administers the Leaking Underground Storage Tank Information System (LUSTIS). The LUSTIS database includes all reported leaks from underground storage tanks. There are no facilities in the LUSTIS database within the immediate vicinity of the project sites.

Site Mitigation Program Property Database (formerly CalSites)

The California Environmental Protection Agency's Department of Toxic Substances Control (DTSC) administers the CalSites program. Information in the CalSites database is preliminary in nature; therefore, most sites listed in the database need additional work to determine if contamination exists. There are no sites in the CalSites database within the immediate vicinity of the project sites.

Hazardous Waste and Substances Sites List (Cortese)

California's Government Code §65962.5 requires the California Department of Toxic Substances Control to develop, at least annually, an updated list of Hazardous Waste and Substances Sites. This list, known as the Cortese List, is a planning document used by the State, local agencies and developers to comply with the California Environmental Quality Act requirements in providing information about the location of hazardous materials release sites. DTSC is responsible for a portion of the information contained in the Cortese List. Other State and local agencies are required to provide additional hazardous materials release information for the Cortese List. The Cortese List is to be submitted to the Secretary of the California Environmental Protection Agency. There are no sites on the Cortese List within the immediate vicinity of the project sites.

Solid Waste Information System (SWIS)

The Solid Waste Information System (SWIS) is a database provided by the California Integrated Waste Management Board which consists of both open as well as closed and inactive solid waste disposal facilities and transfer stations. There are no sites in the SWIS database within the immediate area of the project sites.

Data used to prepare this section were taken from several sources. Full bibliographic entries are provided at the end of this chapter.

Environmental Impact Analysis

Threshold Criteria

The following thresholds of significance are based on Appendix G of the 2009 State CEQA Guidelines. For purposes of this EA/DEIR, implementation of the proposed project may have a significant adverse impact if it would result in any of following:

- Create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials.
- Create a significant hazard to the public or the environment through reasonably upset accident conditions involving the release of hazardous materials into the environment.

- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.
- Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment.
- 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.
- For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area.
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.
- Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Environmental Analysis

Potential Impact. Create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials.

Implementation of the proposed Project would not create any significant hazards as a result of the routine transport, use, storage, or disposal of hazardous materials. However, construction would include the temporary use and transport of fuels, lubricating fluids, solvents and other hazardous materials. The contractor would be required to adhere to the requirements of a *Health and Safety Plan* that it would develop for the Project.

Significance of Impact:

Potentially significant.

Mitigation Measures:

To reduce potentially hazardous conditions and minimize the impacts from the handling of potentially hazardous materials, EMWD should include the following in its construction contract documents:

- The contractor(s) shall enforce strict on-site handling rules to keep construction and maintenance materials out of receiving waters and storm drains. In addition, the contractor(s) shall store all reserve fuel supplies only within the confines of designated construction staging areas, refuel equipment only within the designated construction staging areas, and regularly inspect all construction equipment for leaks.

- The contractor(s) shall prepare a *Health and Safety Plan* in compliance with the requirements of Chapter 6.95, Division 20 of the Health and Safety Code (§§ 25500—25532). The plan shall include measures to be taken in the event of an accidental spill.

Potential Environmental Effects of Measures

All physical improvements or activities that could result in changes to the physical environment required by these mitigation measures would be located within areas evaluated elsewhere in this EA/DEIR. The impacts of implementing such measures, if any, would be similar to those identified for the project in Sections 3 through 18 of this EA/DEIR.

Level of Significance After Mitigation:

Implementation of the above mitigation measures would reduce the impacts to a level of less than significant.

Potential Impact. Create a significant hazard to the public or the environment through reasonably upset accident conditions involving the release of hazardous materials into the environment.

Construction equipment used to construct the Project would have the potential to release oils, grease, solvents and other finishing products through accidental spills.

Significance of Impact:

Potentially significant.

Mitigation Measure:

- The construction staging areas shall be designed to contain contaminants such as oil, grease, and fuel products so that they do not drain towards receiving waters or storm drain inlets.

Potential Environmental Effects of Mitigation Measure

All physical improvements or activities that could result in changes to the physical environment required by these mitigation measures would be located within areas evaluated elsewhere in this EA/DEIR. The impacts of implementing such measures, if any, would be similar to those identified for the project in Sections 3 through 18 of this EA/DEIR.

Level of Significance After Mitigation:

Implementation of the above mitigation measure would reduce the impacts to a level of less than significant.

Potential Impact. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

There are several schools within one-quarter mile of the project sites. The names, addresses, school districts, and proposed pipeline designation closest to the individual schools are shown in Table 9-1.

Table 9-1
Schools within One-Quarter Mile of Proposed Pipeline Alignments

School	Address	District	Pipeline Alignment[1]
Diamond Valley Middle School	291 W. Chambers Hemet, CA 92543	Hemet USD 1791 W. Acacia Avenue Hemet, CA 92545	DV-2
McSweeny Elementary School	451 W. Chambers Hemet, CA 92543	Hemet USD 1791 W. Acacia Avenue Hemet, CA 92545	DV-2
Mount San Jacinto College, Menifee Valley Campus	28237 La Piedra Road Menifee, CA 92584	Mt. San Jacinto Community College District 1499 North State Street San Jacinto, CA 92683-2399	M-1
Hans Christensen Middle School	27625 Sherman Road Menifee, CA 92585	Menifee USD 30205 Menifee Road Menifee, CA 92584	M-2
Boulder Ridge Middle School	27327 Junipero Road Romoland, CA 92585	Menifee USD 30205 Menifee Road Menifee, CA 92584	M-4
Chester W. Morrison Elementary School	30250 Bradley Road Menifee, CA 92584	Menifee USD 30205 Menifee Road Menifee, CA 92584	M-5
Paloma Valley High School	31375 Bradley Road Menifee, CA 92584	Menifee USD 30205 Menifee Road Menifee, CA 92584	M-6
Romoland Elementary School	25890 Antelope Road Romoland, CA 92585	Romoland School District 25900 Heritage Lake Drive Romoland, CA 92585	M-11
LaVorgna Elementary School	31777 Algarve Avenue Winchester, CA 92596	Temecula Valley USD 31350 Rancho Vista Road Temecula, CA 92592-6200	FV-2
Temecula Preparatory Charter High School	31777 Algarve Avenue Winchester, CA 92596	Temecula Valley USD[2] 31350 Rancho Vista Road Temecula, CA 92592-6200	FV-2
French Valley Elementary School	36680 Cady Road Winchester, CA 92596	Temecula Valley USD 31350 Rancho Vista Road Temecula, CA 92592-6200	FV-5

[1] See Figures 2-2, 2-3, and 2-4.
[2] Sponsored by Temecula USD.

However, as stated above, implementation of the proposed Project would not create any significant hazards as a result of the routine transport, use, storage or disposal of hazardous materials. Additionally, potentially hazardous materials used during construction would be handled and used in compliance with the *Health and Safety Plan* that would be developed for the Project. Strict adherence to the *Health and Safety Plan* would insure that the impacts would be less than significant and no further mitigation is required.

Significance of Impact:

No Impact.

Mitigation Measure:

None required.

Potential Impact. Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment.

Several standard environmental record services are available to determine the potential for recognized environmental conditions in an area. As previously described, those databases were researched to determine the location of potential hazardous waste sites within the proposed Project area. In summary, none of the proposed Sub-Project components are near sites that are included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and other standard lists.

Significance of Impact:

No Impact.

Mitigation Measure:

None required.

Potential Impact. 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.

Some of the French Valley Sub-Project proposed recycled water lines would be within two miles of the French Valley Airport. In addition, a portion of the Diamond Valley Sub-Project proposed recycled water lines would within two miles of the Hemet-Ryan Airport. Although not a public airport or public use airport, the March Air Reserve Base would also be within two miles of proposed recycled water lines within the Moreno Valley/Perris North Sub-Project area.

None of the facilities proposed as part of this Project would create a safety hazard for people residing or working in the project area.

Significance of Impact:

No Impact.

Mitigation Measure:

None required.

Potential Impact. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area.

The Project sites are not within the vicinity of a private airstrip *(The Thomas Guide, 2008)*.

Significance of Impact:

No Impact.

Mitigation Measure:

None required.

Potential Impact. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

Implementation of the proposed Project would not physically interfere with an adopted emergency response plan or emergency evacuation plan as all facilities would be underground.

Significance of Impact:

No Impact.

Mitigation Measure:

None required.

Potential Impact. Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

As previously stated, the Project would be within urban areas and be underground and, therefore, not subject to wildland fires.

Significance of Impact:

No Impact.

Mitigation Measure:

None required.

References

California Department of Toxic Substances Control. 2010. www.dtsc.ca.gov. 3/02/10.

California Geological Survey. 2010. Alquist-Priolo. www.conservation.ca.gov. 3/02/10.

California Geological Survey. 2010. Ground Motion Map. www.conservation.ca.gov. 3/02/10.

California Geological Survey. 2010. Seismic Hazards Map. www.conservation.ca.gov. 3/02/10.

Environmental Protection Agency. 2009 www.epa.gov. 4/26/09.

State of California. 2009. *14 California Code of Regulations, Chapter 3, Guidelines for Implementation of the California Environmental Quality Act.* December 30.

State Water Resources Control Board. 2010 www.waterboards.ca.gov. 3/02/10.

Thomas Brothers. 2008. The Thomas Guide San Bernardino and Riverside Counties.

10 Hydrology and Water Quality

Environmental Setting

There are several "blue line" streams in the greater Project area. The major one that would be crossed by one of the proposed recycled water pipelines is Salt Creek at Bradley Road in the City of Menifee. As shown on Figure 10-1, there are several months each year that Salt Creek at Murrieta Road (just downstream of the Bradley Road crossing) is essentially dry. The tributary drainage area at this point is 116 square miles. The gage is at elevation 1,405 feet above mean sea level and is located at Longitude -117°12'17" W and Latitude 33°41'29" N.

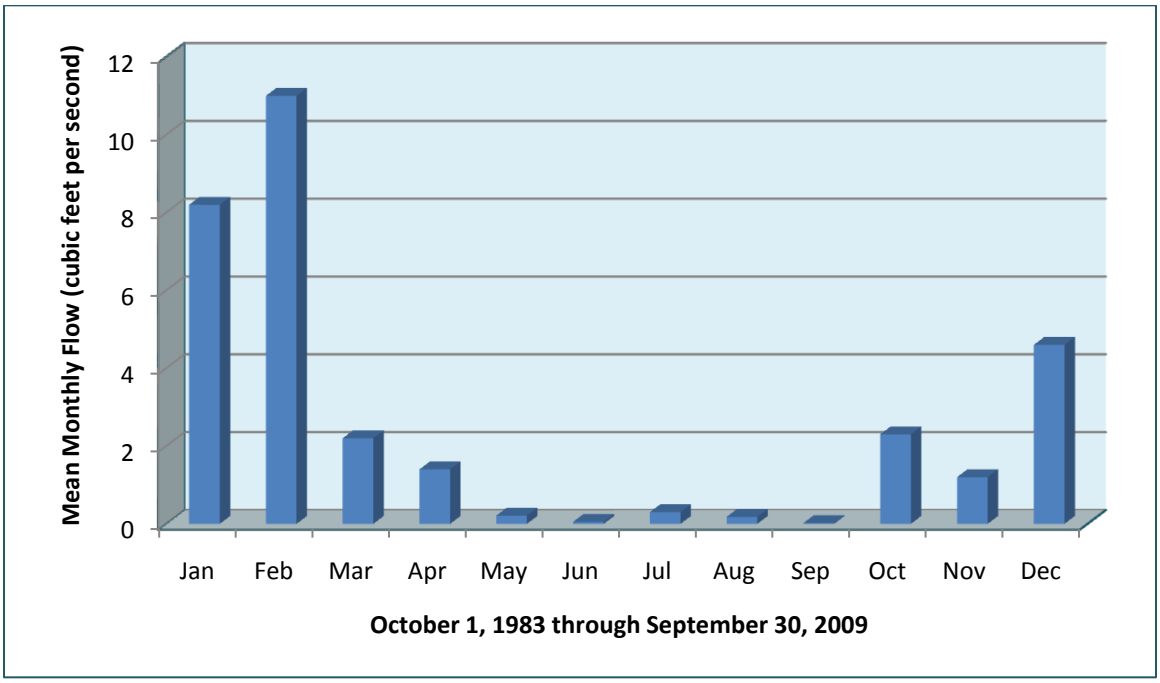

Figure 10-1: Mean Monthly Flows in Salt Creek at Murrieta Road (USGS 11070465)

Other proposed recycled water pipelines would also cross water features [e.g., San Diego Pipeline Nos. 1 and 2 and the San Diego Canal owned by The Metropolitan Water District of Southern California (MWD)] plus some storm drains. The MWD facilities would be crossed by jack and bore techniques or open cut over the facilities depending on MWD requirements. The storm drain facilities would most likely also be crossed by the jack and bore technique.

Regulatory Setting

Federal, California and local regulations have been promulgated to protect the quality of ground and surface water resources. These are briefly explained in the following paragraphs.

Federal

The primary federal laws for protecting water quality are the Clean Water Act (CWA), and the Safe Drinking Water Act (SDWA). These regulations range from establishing maximum contaminant levels to setting anti-degradation policies.

The primary regulatory program for implementing water quality standards is the federal National Pollutant Discharge Elimination System (NPDES) program. In the Project area, the NPDES permits are administered by the California Regional Water Quality Control Board, Santa Ana and San Diego Regions.

California

In California, the State Water Resources Control Board (State Water Board) and the nine Regional Water Quality Control Boards are the primary State agencies that regulate water quality. Individual Regional Boards regulate activities by developing and promulgating a Basin Plan that identifies beneficial uses of waters in the region and establishes policies to protect those uses.

The northern portion of the greater Project area is within the Santa Ana River Basin. The Water Quality Control Plan for the Santa Ana River Basin was adopted by the California Regional Water Quality Control Board, Santa Ana Region on March 11, 1994 and approved by the State Water Resources Control Board (State Water Board) on July 21, 1994 and by the Office of Administrative Law (OAL) on January 24, 1995. It was last updated in February 2008.

The southern portion of the greater Project area is within the Santa Margarita River Basin which is within the San Diego Basin. The Water Quality Control Plan for the San Diego Basin was adopted by the California Regional Water Quality Control Board, San Diego Region on September 8, 1994 and approved by the State Water Resources Control Board (State Water Board) on December 13, 1994 and by the Office of Administrative Law (OAL) on April 26, 1995. It was last updated in April 2007.

The Basin Plans set standards to protect all waters in the Basins and prescribe programs to implement these standards. The standards consist of the designated beneficial uses of the waters, narrative and numerical objectives to protect these uses, and the State's antidegradation policy.

Construction activities disturbing one or more acres are required by the State Water Board to comply with the provisions of the General Permit for Discharges of Storm Water Associated with Construction Activity which is administered by the Regional Boards. Compliance with this permit requires the applicant to prepare a Storm Water Pollution Prevention Plan (SWPPP), implement best management practices (BMP's), and monitor to insure that impacts to water quality are minimized. On September 2, 2009, the State Water Board adopted Order No. 2009-0009-DWQ which is the revised General Permit for Discharges of Storm Water Associated with Construction Activity. This revised General Permit becomes effective on July 1, 2010.

Pursuant to Section 401 of the CWA, the Army Corps of Engineers cannot issue a federal permit under Section 404 of the CWA until the State has issued a water quality certification or waiver to ensure that the project will comply with State water quality standards. The authority to issue the water quality certification or waiver in the Project area is vested with the Regional Boards.

Environmental Impact Analysis

Threshold Criteria

The following thresholds of significance are based on Appendix G of the 2009 State CEQA Guidelines. For purposes of this EA/DEIR, implementation of the proposed Project may have a significant adverse impact if it would do any of following:

- Violate any water quality standards or waste discharge requirements.
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in substantial erosion or siltation on- or off-site.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site.
- Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.
- Otherwise substantially degrade water quality.
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.
- Place within a 100-year flood hazard area structures that would impede or redirect flood flows.
- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.
- Be inundated by seiche, tsunami, or mudflow.

Environmental Analysis

Potential Impact. Violate any water quality standards or waste discharge requirements.

During site grading and excavation activities, bare soil would be exposed to wind and water erosion. If precautions are not taken to contain sediments, construction activities could produce sediment laden storm runoff that would exceed limits contained in the National Pollutant Discharge Elimination System (NPDES) General Construction Permit applicable to this Project. In addition to increased erosion potential, hazardous materials associated with construction equipment could adversely affect water quality if spilled or stored improperly. (See previous section for a full discussion and mitigation measures associated with hazardous materials.) Also, construction in areas of high groundwater could require dewatering with a subsequent discharge to surface waters.

Significance of Impact:

Potentially significant.

Mitigation Measures:

EMWD should require contractors to implement a program of best management practices (BMP's) and best available technologies to reduce potential impacts to water quality that may result from construction activities. To reduce or eliminate construction-related water quality impacts before the onset of construction activities, EMWD should obtain coverage under the National Pollutant Discharge Elimination System (NPDES) General Construction Permit. Construction activities shall comply with the conditions of this permit that include preparation of a storm water pollution prevention plan, implementation of BMP's, and monitoring to insure impacts to water quality are minimized. As part of this process, multiple BMP's should be implemented to provide effective erosion and sediment control. These BMP's should be selected to achieve maximum sediment removal and represent the best available technology that is economically achievable. BMP's to be implemented as part of this mitigation measure should include, but not be limited to, the following:

- Temporary erosion control measures such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other groundcover shall be employed for disturbed areas.

- Storm drain inlets on the site and in downstream offsite areas shall be protected from sediment with the use of BMP's acceptable to EMWD, local jurisdictions and the California Regional Water Quality Control Boards, Santa Ana or San Diego Region.

- Dirt and debris shall be swept from paved streets in the construction zone on a regular basis, particularly before predicted rainfall events.

- No disturbed surfaces shall be left without erosion control measures in place between October 15 and April 15. EMWD shall file a Notice of Intent with the Regional Board and require the preparation of a pollution prevention plan prior to commencement of construction. EMWD shall routinely inspect the construction site to verify that the BMP's specified in the pollution prevention plan are properly installed and maintained. EMWD shall immediately notify the contractor if there were a noncompliance issue and require immediate compliance.

- Controls on construction site dewatering shall be implemented. If possible, water generated as part of construction dewatering shall be discharged onsite such that there would be no discharge to surface waters. If discharge to surface waters were unavoidable, EMWD shall obtain coverage under the NPDES General Dewatering Permit prior to commencement of construction. The provisions of this permit are sufficiently protective of water quality to ensure that impacts to surface waters would remain below significance thresholds. During dewatering activities, all permit conditions shall be followed. EMWD shall routinely inspect the construction site to verify that the measures specified in the permit are properly implemented. EMWD shall immediately notify the contractor if there were a noncompliance issue and require immediate compliance.

Potential Environmental Effects of Measures:

All physical improvements or activities that could result in changes to the physical environment required by these mitigation measures would be located within areas evaluated elsewhere in this EA/DEIR. The impacts of implementing such measures, if any, would be similar to those identified for the project in Sections 3 through 18 of this EA/DEIR.

Level of Significance After Mitigation:

Implementation of the above mitigation measures would reduce the impacts to a level of less than significant.

Potential Impact. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).

The proposed Project would not use groundwater for any purpose and therefore would not substantially deplete groundwater supplies. In fact the opposite is true. A portion of this Project would substitute recycled water for use by those agricultural interests presently using groundwater.

There are no groundwater recharge facilities in the immediate Project area; therefore, the Project would not interfere with groundwater recharge activities.

Significance of Impact:

No impact.

Mitigation Measure:

None Required.

Potential Impact. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in substantial erosion or siltation on- or off-site.

The proposed pipelines would be located underground and therefore would not affect existing drainage patterns.

Significance of Impact:

No impact.

Mitigation Measure:

None Required.

Potential Impact. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site.

The proposed pipelines would be located underground and would not increase runoff that could affect storm water drainage facilities.

Significance of Impact:

No impact.

Mitigation Measure:

None Required.

Potential Impact. Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.

The proposed pipelines would be located underground and would not increase runoff that could affect storm water drainage facilities.

Significance of Impact:

No impact.

Mitigation Measure:

None Required.

Potential Impact. Otherwise substantially degrade water quality.

As described above, the proposed Project would not degrade water quality as it would have to comply with the terms of the National Pollutant Discharge Elimination System (NPDES) General Construction Permit.

Significance of Impact:

No impact.

Mitigation Measure:

None Required.

Potential Impact. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.

The proposed Project does not involve housing.

Significance of Impact:

No impact.

Mitigation Measure:

None Required.

Potential Impact. Place within a 100-year flood hazard area structures that would impede or redirect flood flows.

No permanent above ground facilities would be constructed within a 100-year flood plain.

Significance of Impact:

No impact.

Mitigation Measure:

None Required.

Potential Impact. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.

The proposed Project would not expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.

Significance of Impact:

No impact.

Mitigation Measure:

None Required.

Potential Impact. Be inundated by seiche, tsunami, or mudflow.

The proposed Project is not close to any existing water bodies that would be subject to seiches or tsunamis, or significant topography that would cause mud flows.

Significance of Impact:

No impact.

Mitigation Measure:

None Required.

References

California Regional Water Quality Control Board, San Diego Region. 1994. Water Quality Control Plan for the San Diego Basin. September 8. (Updated April 2007).

California Regional Water Quality Control Board, Santa Ana Region. 1994. Water Quality Control Plan for the Santa Ana River Basin. March 11. (Updated February 2008).

State of California. 2009. *Title 14 California Code of Regulations, Chapter 3, Guidelines for Implementation of the California Environmental Quality Act.* December 30.

State Water Resources Control Board. 2009. Order No. 2009-0009-DWQ. General Permit for Storm Water Discharges Associated with Construction Activities. September 2.

11 Land Use and Planning

Environmental Setting

Project facilities would be constructed within the cities of Moreno Valley, Perris, San Jacinto, Hemet, and Menifee and within an unincorporated area of Riverside County referred to as French Valley which is within the southwest area of Riverside County. General Plans were adopted for the Project area as follows:

- City of Hemet. 2009. *Proposed Land Use Plan and Circulation System*. March.
- City of Moreno Valley. 2009. *General Plan Land Use.* March 9.
- City of Perris. 2009. *City of Perris General Plan.* February 19.
- City of San Jacinto. 2009. *General Plan Land Use.* October.
- Riverside County Board of Supervisors, *Riverside General Plan*, adopted October 7, 2003.
- Riverside County Board of Supervisors, *Southwest Area Plan,* adopted on October 7, 2003.
- Riverside County Board of Supervisors, *Sun City/Menifee Area Plan,* adopted on October 7, 2003.

To date, the City of Menifee, which was incorporated on October 8, 2008 has not officially adopted a general plan but relies on the Riverside County Sun City/Menifee Area Plan. It is presently preparing its individual general plan.

The proposed recycled water pipeline would be constructed within public street rights-of-way which are not subject to zoning for a particular use.

Data used to prepare this section were taken from several sources. Full bibliographic entries are provided at the end of this chapter.

Environmental Impact Analysis

Threshold Criteria

Section 15382 of the State CEQA Guidelines defines a “significant effect on the environment” as a “substantial or potentially substantial adverse change in the physical conditions within the area affected by the proposed project”. The following thresholds of significance are based on Appendix G of the 2009 State CEQA Guidelines. According to the State CEQA Guidelines, significant land use or planning impacts would occur if a proposed project would result in any of the following:

- Physically divide an established community.
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.
- Conflict with any applicable habitat conservation plan or natural community conservation plan.

Environmental Analysis

Potential Impact. Physically divide an established community.

The proposed recycled water pipelines would be underground and constructed within public street rights-of-way. Therefore implementation of the Project will not interfere with or divide an established community.

Significance of Impact:

No Impact.

Mitigation Measure:

None Required.

Potential Impact. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.

The proposed recycled water pipelines would be constructed within existing public rights-of-way that are not designated by a general plan or zoning ordinance for a specific use. Therefore, implementation of the Project would not conflict with any land use plan, policy or regulation of an agency with jurisdiction over the Project.

Significance of Impact:

No Impact.

Mitigation Measure:

None Required.

Potential Impact. Conflict with any applicable habitat conservation plan or natural community conservation plan.

Implementation of the proposed Project would not conflict with the Western Riverside County Multiple Species Habitat Conservation Plan. Additional information concerning this subject is contained in the Biological Resources section of this document.

Significance of Impact:

No Impact.

Mitigation Measure:

None Required.

References

City of Hemet. 2009. *Proposed Land Use Plan and Circulation System*. March.

City of Moreno Valley. 2009. *General Plan Land Use.* March 9.

City of Perris. 2009. *City of Perris General Plan.* February 19.

City of San Jacinto. 2009. *General Plan Land Use.* October.

Riverside County Board of Supervisors, *Riverside General Plan*, adopted October 7, 2003.

Riverside County Board of Supervisors, *Southwest Area Plan,* adopted on October 7, 2003.

Riverside County Board of Supervisors, *Sun City/Menifee Area Plan,* adopted on October 7, 2003.

Riverside County Board of Supervisors. 1986. *Dutch Valley Specific Plan No. 106*. October 14.

State of California. 2009. *Title 14 California Code of Regulations, Chapter 3, Guidelines for Implementation of the California Environmental Quality Act.* December 29.

12 Mineral Resources

Environmental Setting

There are no active mining sites within the project area and according to the local general plans there are no important mineral resources within the project area.

Data used for this section were obtained from various sources. Full bibliographical entries for all reference material are contained at the end of this section.

Environmental Impact Analysis

Threshold Criteria

The following thresholds of significance are based on Appendix G of the 2009 State CEQA Guidelines. According to the State CEQA Guidelines, a project would normally have a significant effect on the environment if it would:

- Result in the loss of availability of a known resource that would be of value to the region and the residents of the state.
- 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.

Environmental Analysis

Potential Impact. Result in the loss of availability of a known resource that would be of value to the region and the residents of the state.

No known mineral deposits are identified within the Project area.

Significance of Impact:

No Impact.

Mitigation Measures:

None required.

Potential Impact. 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.

There are no locally-important mineral resource recovery sites delineated in the applicable general plans. Consequently, the Project would not result in the loss of a locally-important mineral resource.

Significance of Impact:

No Impact.

Mitigation Measures:

None required.

References

City of Hemet. 2009. *Proposed Land Use Plan and Circulation System*. March.

City of Moreno Valley. 2009. *General Plan Land Use.* March 9.

City of Perris. 2009. *City of Perris General Plan.* February 19.

City of San Jacinto. 2009. *General Plan Land Use.* October.

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Riverside County Board of Supervisors, *Sun City/Menifee Area Plan,* adopted on October 7, 2003.

Riverside County Board of Supervisors. 1986. *Dutch Valley Specific Plan No. 106*. October 14.

State of California. 2009. *Title 14 California Code of Regulations, Chapter 3, Guidelines for Implementation of the California Environmental Quality Act.* December 29.

13 Noise

Environmental Setting

Noise is usually defined as "unwanted sound". It consists of any sound that may produce physiological or psychological damage and/or interfere with man's communication, work, rest, recreation and sleep. People recognize that noise has become an environmental pollutant.

To the human ear, sound has two significant characteristics: pitch and loudness. Pitch is generally an annoyance, while loudness can affect our ability to hear. Pitch is the number of complete vibrations (cycles per second) of a wave that results in the tone's range from high to low. Loudness is the strength of a sound that describes a noisy or quiet environment. It is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound waves combined with the reception characteristics of the ear. The sound intensity refers to how hard the sound wave strikes objects, which, in turn, produces the sound's effect. This is a characteristic of sound that can be precisely measured with instruments.

Sound intensity or acoustic energy is measured in decibels (dB) that are weighted to correct for the relative frequency response of the human ear. For example, an A-weighted noise level dB(A) includes a de-emphasis on high frequencies of sound that are heard by a dog's ear but not by a human's ear. The zero on the decibel scale is based on the lowest level that the healthy, unimpaired human ear can detect. Unlike linear units (inches or pounds), decibels are measured on a logarithmic scale, representing points on a sharply rising curve.

Many noise rating schemes have been developed for various time periods, but an appropriate rating of ambient noise affecting human communities also needs to account for the annoying effects of sound. The predominant rating scales for human communities are the Noise Equivalent Level (Leq), the Community Noise Equivalent Level (CNEL), and the Day-Night Average Sound Level (Ldn), all of which are based on A-weighted decibels [dB(A)]. The Leq is the total sound energy of time-varying noise over a sample period. The CNEL is the time-varying noise over a 24-hour period with a weighting factor applied to noise occurring during the evening hours of 7:00 pm to 10:00 pm (relaxation hours) and at night from 10:00 pm to 7:00 am (sleeping hours) of 5 and 10, respectively.

Physical damage to human hearing begins at prolonged exposures to more than 85 decibels. Exposure to high noise levels affects our entire system, with prolonged noise exposure in excess of 75 decibels increasing body tension, thereby affecting blood pressure, functions of the heart, and the nervous system. Extended periods of noise exposure above 90 dB(A) will result in permanent cell damage. A sound level of 190 dB(A) will rupture the ear drum and permanently damage the inner ear.

The ambient noise problem is widespread and generally more concentrated within urban areas than in outlying residential neighborhoods. Environmental sound levels in high density urban areas are doubling

every 10 years. Suburban areas are not experiencing such a significant increase in noise levels because of their relative distance from major noise sources.

According to Occupational Safety and Health Administration (OSHA) regulations, protection against the effects of noise exposure shall be provided when the sound level exceeds those shown in Table 13-1. This table shows the maximum exposure in Ldn for various land use categories and locations (whether indoor or outdoor). This maximum is provided according to the health and psychological effects described above, with a reasonable margin of safety. Table 13-1 identifies also whether the threshold applies to activity interference, hearing loss consideration, or both effects.

Table 13-1
Yearly Average Equivalent Sound
Identified to Protect the Public Health and Welfare

	Measure	Indoor		To Protect Against Both Effects(a)	Outdoor		To Protect Against Both Effects(a)
		Activity Interference	Hearing Loss Consideration		Activity Interference	Hearing Loss Consideration	
Residential with Outside Space and Farm Residences	Ldn Leq(24)	45	70	45	55	70	55
Residential with No Outside Space	Ldn Leq(24)	45	70	45			
Commercial	Leq(24)	(b)	70		(b)	70	70(c)
Industrial	Leq(24)(d)	(b)	70	(b)	(b)	70	70(c)
Hospitals	Ldn Leq(24	45	70	70(c)	55	70	55
Educational	Ldn Leq(24)	45	70	45	55	70	55
Recreational Areas	Leq(24)	(b)	70	45	(b)	70	70(c)
Farm Land and General Unpopulated Land	Leq(24)		70	70(c)	(b)	70	70(c)

Code:
a. Based on lowest level.
b. Because different types of activities appear to be associated with different levels, identification of a maximum level for activity interface may be difficult except in those circumstances where speech communication is a critical activity.
c. Based only on hearing loss.
d. An Leq(8) may be identified in these situations so long as the exposure over the remaining 16 hours per day is low enough to result in a negligible contribution to the 24-hour average (i.e., no greater than an Leq of 60 dB.

Note: Explanation of identified level for hearing loss: the exposure period which results in hearing loss at the identified level is a period of 40 years.

Source: California Occupational Safety and Health Administration.

A maximum of 45 dB protects against indoor activity interference and hearing loss for residential, hospital, and educational land uses. Outdoor activity interference threshold levels are high for these land uses, at 55 dB. Commercial, transportation, industrial and recreation activities are considered highly variable, so thresholds for these land uses have not been determined. Similarly, agricultural-

related outdoor activities have no stated interference noise levels. Hearing loss consideration for all activities becomes an issue at 70 dB or greater, for both indoor and outdoor noises.

Noise sources may either be a "line source" (e.g., a heavily traveled roadway) or a "point source" (e.g., a stationary engine or compressor). Highway traffic noise on high volume roadways simulates a "line source" and the drop-off rate of sound with distance approaches 3 dB(A) drop with every doubling of distance between the noise source and the noise receiver.

Environmental factors such as the wind direction and speed, temperature gradients, the characteristics of the ground (hard or soft) and the air (relative humidity), the presence of grass, shrubbery, and trees, often combine to increase the actual attenuation achieved outside laboratory conditions to a 4.5 dB(A) drop with every doubling of distance. Thus, a noise level of 74.5 decibels at 50 feet from a highway centerline would attenuate to 70.0 decibels at 100 feet, 65.5 decibels at 200 feet, and so forth.

This is particularly true where the view of the roadway is interrupted by isolated buildings, clumps of bushes or scattered trees, or the intervening ground is soft and covered with vegetation and the source or receiver is located more than 3 meters above the ground. It should be noted, however, that the nominal value of 3.0 dB(A) with doubling applies to sound propagation from a "line source": (1) over the top of a barrier greater than 3 meters in height, or (2) when there is a clear unobstructed view of the highway, the ground is hard, there are no intervening structures, and the height of the line-of-sight averages more than 3 meters above the ground.[1]

Noise levels adjacent to roadways vary with the volume of traffic, the average vehicular speed, and truck mix. The noise levels adjacent to line sources of noise such as roadways increase by 3.0 dB(A) with each doubling in the traffic volume (provided that the speed and truck mix do not change). From the relationship between increases in the number of noise sources (motor vehicles) and the increase in the adjacent noise level, it can be shown that a 26 percent increase in the traffic volumes on a given route increases the adjacent noise levels 3.0 dB(A), but changing the vehicle speed or truck mix has an even more dramatic effect.

The truck mix on a given roadway also has a significant effect on the adjacent noise levels. As the number of trucks increases and becomes a larger percentage of the total vehicle volume, the adjacent noise levels increase. This effect is more pronounced if the number of heavy duty (3+ axle) trucks is large when compared to the number of medium duty (2 axle) trucks.

Noise from motor vehicles is generated by engine vibration, the interaction between the tires and the road, and the exhaust system. As vehicle speed increases, so does the noise from these areas of the vehicle. The noise level adjacent to a roadway is highly dependent on the average vehicle speed, especially at lower speed levels. The higher speeds are typically measured at midlink, where traffic lights, stop signs and cross traffic provide less interference. Although some vehicles will go faster that

[1] Source: Caltrans, 1980.

the posted speed limit, in most areas the average speed is just below this limit. The exception is found along lone stretches of highway and streets outside city limits.

The ambient noise level of a region is the total noise generated within the specific environment and is usually composed of sounds emanating from natural and manmade sources. Noise levels monitored in a region tend to have wide spatial and temporal variation due to the great diversity of contributing sources. This is especially true for the greater project area with its blend of rural land uses adjacent to a mix of residential and recreational uses.

Characterization of the Project area noise levels is difficult due to the lack of actual field measurements. Very little noise measurement data are available for the Project area in general. However, typical noise levels for areas like the proposed recycled water pipeline locations are in the range of 45 to 55 dB(A).

Generally, the noise levels in the Project area are affected by natural and manmade sources. However, the sound levels are more strongly influenced by human rather than natural sound sources. Within the Project area, the major sources of noise include vehicular traffic and aircraft flyovers.

Data used for this section were obtained from various sources. Full bibliographical entries for all reference material are contained at the end of this section.

Environmental Impact Analysis

Threshold Criteria

The following thresholds of significance are based on Appendix G of the 2009 State CEQA Guidelines. According to the State CEQA Guidelines, a project would have a significant effect on the environment if it would result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- Exposure of persons to or generation of excessive groundbourne vibration or groundbourne noise levels.
- A substantial permanent increase in ambient noise levels above levels existing without the project.
- A substantial temporary or periodic increase in noise levels in the project vicinity above levels existing without the project.
- 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 expose people residing or working in the project area to excessive noise levels.

- For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.

Environmental Analysis

Potential Impact. Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

Riverside County has adopted noise standards for a variety of land uses. Community Noise Equivalent Levels (CNEL) to 60 dB(A) are normally acceptable and CNEL to 70 dB(A) are conditionally acceptable with an analysis for noise reduction. These noise levels were developed for review of land use projects such as highways, airports, and manufacturing plants. However, there is no mention of temporary construction-related noise impacts in the County's Noise Ordinance.

The City of San Jacinto has also adopted a noise ordinance. With respect to construction, that ordinance states:

> *It is unlawful to create and emit noise from equipment operated during construction activities, whether on private property or within the public right-of-way between the hours of seven p.m. of one day and seven a.m. of the following day, and at any time on Sunday. Emergency construction activities or emergency repairs resulting from an unforeseen occurrence are specifically exempt from the provisions of this chapter. Such equipment includes, but is not limited to, trucks, road graders, tractors, power saws, power drills and generators.*

The City of Moreno Valley has also adopted a noise ordinance. With respect to construction, that ordinance states:

> *No person shall operate or cause the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between the hours of eight p.m. and seven a.m. the following day such that the sound there from creates a noise disturbance, except for emergency work by public service utilities or for other work approved by the city manager or designee.*

The City of Perris limits maximum noise levels due to construction and hours of construction activity in its General Plan. Section 7.34.060 restricts construction noise to 80 dB(A) in residential zones, restricts construction to the hours of 7 a.m. to 7 p.m., and prohibits construction on holidays with the exception of Columbus Day and Washington's birthday, and Sundays.

The City of Hemet has not adopted a noise ordinance that relates to construction activities.

Without mitigation, construction activities could violate the provisions of these ordinances.

Significance of Impact:

Potentially significant.

Mitigation Measure:

EMWD should include the following in its construction contract documents:

- Construction activities shall be limited to between the hours of 7:00 am and 7:00 pm and as necessary to comply with local ordinances. Any holiday, nighttime or weekend construction activities shall be subject to local permitting requirements.

Potential Environmental Effects of Measure:

All physical improvements or activities that could result in changes to the physical environment required by these mitigation measures would be located within areas evaluated elsewhere in this EA/DEIR. The impacts of implementing such measures, if any, would be similar to those identified for the project in Sections 3 through 18 of this EA/DEIR.

Level of Significance After Mitigation:

Implementation of the above mitigation measure would reduce the impacts to a level of less than significant.

Potential Impact. Expose persons to or generate excessive groundbourne vibration or groundbourne noise levels.

Construction activities associated with the Project could result in some minor amount of ground vibration. Vibration from construction activity is typically below the threshold of perception when the activity is more than 50 feet from receivers. Due to the fact that there are only a few receivers within 50 feet of the construction site this would be considered a less than significant impact and no mitigation is required.

Significance of Impact:

Less than significant.

Mitigation Measure:

None required.

Potential Impact. A substantial permanent increase in ambient noise levels above levels existing without the project.

The proposed recycled water pipelines would be underground and not generate any noise. Therefore, the proposed Project would not result in a substantial permanent increase in ambient noise levels above levels existing without the Project.

Significance of Impact:

Less than Significant.

Mitigation Measure:

None Required.

Potential Impact. A substantial temporary or periodic increase in noise levels in the project vicinity above levels existing without the project.

The analysis of noise impacts resulting from any project must consider both the construction and operational phases. However, due to the nature of this Project, very little noise would be associated with the operational phase of the Project. Therefore, the following noise analysis concentrates on the construction phase of the Project.

Operation of equipment used during construction would temporarily increase noise levels to well in excess of ambient noise levels. The construction noise would vary with the particular construction stage in progress due to the different pieces of construction equipment being used. Six major construction stages would be associated with the pipelines. These are:

- ***Clearing.*** Cutting of the road or shoulder surface in preparation for trenching.
- ***Trenching.*** Digging the actual trench with a backhoe or excavator.
- ***Pipelaying.*** Assembling the pipe segments and laying them in the trench.
- ***Backfilling.*** Filling the trenches with appropriate materials to support the pipes.
- ***Compaction.*** Compaction of the fill material to enhance its load bearing capacity.
- ***Restoration.*** Restoring the project area to its pre-construction condition.

Table 13-2 lists equipment expected to be used during construction and identifies the number of pieces of equipment typically used, their utilization factor, their reference sound level at a distance of 50 feet, and an indication of the construction phase in which each piece of equipment would be used.

Table 13-2
Construction Equipment List
Utilization Factors and Reference Sound Levels

Equipment	Number Required	Horsepower Rating	Utilization Factor	Sound Level dB(A)	Construction Phase
Compressor	2	N/A	0.2	82	Clearing
Concrete Saw	1	20	0.1	82	Clearing
Pavement Breaker	1	100	0.1	88	Clearing
Backhoe/Loader	2	150	0.6	78	Trenching
Dump Truck	1	225	0.6	82	Trenching & Backfilling
Utility Truck	1	225	0.6	82	Trenching & Backfilling
Crane	1	100	0.1	86	Pipelaying
Hydraulic Excavator	1	N/A	0.8	82	Trenching
Water Truck	1	225	0.2	91	All
Compactor	1	N/A	0.1	82	Backfilling
Sweeper	1	N/A	0.1	85	All
Paver	1	N/A	0.1	80	Restoration
On-Road Trucks	2	225	1.0	80	All
Pickups	2	N/A	1.0	72	All

As shown above, noise associated with construction could be locally significant during the construction period. However, the exact degree of impact on the surrounding community would depend on the type of equipment being used at any one time, the distance from the equipment, and the hours of operation. It is anticipated that noise levels associated with construction would range from 72 to 91 dB(A) within 50 feet of the equipment being used. These noise levels would be significantly attenuated by the distance to the nearest receptor. However, the increased noise levels could impact several schools as shown in Section 9, Hazards and Hazardous Materials. These impacts should not last more than a week and could occur during non-school periods.

Mitigation Measures

EMWD should include the following in its construction contract documents:

- All equipment used during construction shall be muffled and maintained in good operating condition. All internal combustion engines should be fitted with well maintained mufflers in accordance with manufacturer's recommendations.

- The contractor shall contact each school prior to conducting work adjacent to the school grounds.

Potential Environmental Effects of Measure:

All physical improvements or activities that could result in changes to the physical environment required by these mitigation measures would be located within areas evaluated elsewhere in this EA/DEIR. The impacts of implementing such measures, if any, would be similar to those identified for the project in Sections 3 through 18 of this EA/DEIR.

Level of Significance After Mitigation:

Implementation of the above mitigation measure would reduce the impacts to a level of less than significant.

Potential Impact. 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 expose people residing or working in the project area to excessive noise levels.

The proposed Project would be within two miles of March Air Reserve Base as well as Hemet Ryan and French Valley Airports. However, the Project would not expose people residing or working in the Project area to excessive noise levels.

Significance of Impact:

No impact.

Mitigation Measure:

None Required.

Potential Impact. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.

The proposed Project would be within two miles of March Air Reserve Base as well as Hemet Ryan and French Valley Airports. However, the Project would not expose people residing or working in the Project area to excessive noise levels.

Significance of Impact:

No impact.

Mitigation Measure:

None Required.

References

California Department of Transportation. 1980. Traffic Manual.

California Occupational Safety and Health Administration. Yearly Average Equivalent Sound Identified to Protect the Public Health and Welfare.

City of Hemet. 2009. *Proposed Land Use Plan and Circulation System*. March.

City of Moreno Valley. 2009. *General Plan Land Use.* March 9.

City of Perris. 2009. *City of Perris General Plan.* February 19.

City of San Jacinto. 2009. *General Plan Land Use.* October.

Riverside County Board of Supervisors, *Riverside General Plan*, adopted October 7, 2003.

Riverside County Board of Supervisors, *Southwest Area Plan,* adopted on October 7, 2003.

Riverside County Board of Supervisors, *Sun City/Menifee Area Plan,* adopted on October 7, 2003.

Riverside County Board of Supervisors. 1986. *Dutch Valley Specific Plan No. 106*. October 14.

State of California. 2009. *Title 14 California Code of Regulations, Chapter 3, Guidelines for Implementation of the California Environmental Quality Act.* December 30.

14 Population and Housing

Environmental Setting

The Project is located in several U.S. Postal Zip Codes. The U.S. Census Bureau *(census.gov 3/08/10)* reported the following data for 2000.

Zip Code	Population	Housing Units
92543	39,674	14,084
92551	22,963	6,418
92571	26,355	7,573
92582	4,444	1,893
92584	14,061	5,160
92585	8,674	3,248
92586	18,142	9,619
Totals	134,313	47,995

Data used for this section were obtained from various sources. Full bibliographical entries for all reference material are contained at the end of this section.

Environmental Impact Analysis

Threshold Criteria

The following thresholds of significance are based on Appendix G of the 2009 State CEQA Guidelines. According to the State CEQA Guidelines, a project would normally have significant population and housing impacts if it would:

- Induce substantial 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).
- Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere.
- Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

Environmental Analysis

Potential Impact. Induce substantial 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 proposed Project is a recycled water project and as such it would not accommodate growth in excess of that contained in the appropriate General Plans. The environmental effects of growth in the area were addressed in appropriate CEQA documents prepared by the cities of Moreno Valley, Perris, San Jacinto, and Hemet as well as the County of Riverside and deemed to be less-than-significant.

Significance of Impact:

No impact.

Mitigation Measure:

None required.

Potential Impact. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere.

The proposed Project would not displace any existing housing, necessitating the construction of replacement housing elsewhere.

Significance of Impact:

No impact.

Mitigation Measure:

None required.

Potential Impact. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

The proposed Project would not displace any people, necessitating the construction of replacement housing elsewhere.

Significance of Impact:

No impact.

Mitigation Measure:

None required.

References

City of Hemet. 2009. *Proposed Land Use Plan and Circulation System*. March.

City of Moreno Valley. 2009. *General Plan Land Use.* March 9.

City of Perris. 2009. *City of Perris General Plan.* February 19.

City of San Jacinto. 2009. *General Plan Land Use.* October.

Riverside County Board of Supervisors, *Riverside General Plan*, adopted October 7, 2003.

Riverside County Board of Supervisors, *Southwest Area Plan,* adopted on October 7, 2003.

Riverside County Board of Supervisors, *Sun City/Menifee Area Plan,* adopted on October 7, 2003.

Riverside County Board of Supervisors. 1986. *Dutch Valley Specific Plan No. 106*. October 14.

State of California. 2009. *Title 14 California Code of Regulations, Chapter 3, Guidelines for Implementation of the California Environmental Quality Act.* December 29.

U.S. Census. 2000. www.census.gov (3/09/10).

15 Public Services

Environmental Setting

Public services in the project area are provided by the following entities:

- Police Protection
  California Highway Patrol
  Riverside County Sheriff's Department
  City of Moreno Valley Police Department
  City of Perris Police Department
  City of Hemet Police Department
  City of San Jacinto Police Department

- Fire Protection
  California Department of Forestry and Fire Protection
  Riverside County Fire Department
  City of Moreno Valley Fire Department
  City of Perris Fire Department
  City of Hemet Fire Department
  City of San Jacinto Fire Department

- Schools
  Hemet Unified School District
  Menifee Union School District
  Moreno Valley Union School District
  Mount San Jacinto Community College District
  Perris School District
  Perris Union High School District
  Romoland School District
  San Jacinto Unified School District
  Temecula Valley Unified School District
  Val Verde Union School District

- Ambulance
  AMR Ambulance under contract to Riverside County

Data used for this section were obtained from various sources. Full bibliographical entries for all reference material are contained at the end of this section.

Environmental Impact Analysis

Threshold Criteria

The following thresholds of significance are based on Appendix G of the 2009 State CEQA Guidelines. With respect to public services, a project would normally have a significant impact on the environment if it would:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services: fire protection, police protection, schools, parks, or other public services.

Environmental Analysis

Potential Impact. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services: fire protection, police protection, schools, parks, or other public services.

The proposed Project would not require additional public services.

Significance of Impact:

No impact.

Mitigation Measure:

None Required.

References

County of Riverside. www.countyofriverside.ca.us 3/08/10

State of California. 2009. *Title 14 California Code of Regulations, Chapter 3, Guidelines for Implementation of the California Environmental Quality Act.* December 29.

16 Recreation

Environmental Setting

There are several recreational opportunities within the greater Project area including Perris Valley Lake, Diamond Valley Lake, regional parks, community parks, and golf courses.

Data used for this section were obtained from various sources. Full bibliographical entries for all reference material are contained at the end of this section.

Environmental Impact Analysis

Threshold Criteria

The following thresholds of significance are based on Appendix G of the 2009 State CEQA Guidelines. According to the State CEQA Guidelines, a project would normally have a significant effect on the environment if it would: 1) increase the use of existing recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated or 2) include recreational facilities or require construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

Environmental Analysis

Potential Impact. Increase the use of existing recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated.

The proposed Project would not increase the use of existing neighborhood and regional parks or other recreational facilities.

Significance of Impact:

No Impact.

Mitigation Measure:

None required.

Potential Impact. Include recreational facilities or require construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

The proposed Project does not include housing units and therefore would not require the construction or expansion of recreational facilities.

Significance of Impact:

No Impact.

Mitigation Measure:

None required.

References

State of California. 2009. *Title 14 California Code of Regulations, Chapter 3, Guidelines for Implementation of the California Environmental Quality Act.* December 29.

The Thomas Guide, San Bernardino and Riverside Counties, 2008.

17 Transportation/Traffic

Environmental Setting

Regional access to the Project area is from the Escondido Freeway (Highway 215), Highway 74 and Winchester Road (Highway 79). The California Department of Transportation's (Caltrans) latest traffic counts (2008) for these State highways at varying locations in the Project area are as shown in Table 17-1.

Table 17-1
Selected Traffic Counts by Caltrans
(2008)

Location	Southbound			Northbound		
	Peak Hour	Peak Month	AADT[1]	Peak Hour	Peak Month	AADT[1]
Escondido Freeway (Highway 215)						
McCall Blvd	6,500	86,000	83,000	5,800	77,000	74,000
Ramona Exp	8,400	106,000	103,000	9,600	120,000	117,000
Alessandro B	10,300	129,000	126,000	10,200	127,000	124,000
Highway 74						
Ethanac Rd	2,000	24,700	24,000	1,950	25,000	24,500
Menifee Rd	1,950	25,000	24,500	2,600	32,500	30,500
Winchester Road (Highway 79)						
Benton Rd.	2,750	32,000	30,500	2,050	24,700	23,500
Simpson Rd.	1,250	13,700	13,200	820	9,100	8,800

[1] AADT = Average Annual Daily Traffic
Source: Caltrans 2010, www.dot.ca.gov (3/19/10)

Some of the local agencies also take traffic counts on their respective streets throughout the Project area. Selected data are provided in Table 17-2.

Table 17-2
Selected Traffic Counts by Local Agencies

Street	Intersection	Date	ADT[1]	Agency
Antelope Road	La Pierdra Road	2/04/09	4,973	County of Riverside
Benton Road	Winchester Road	5/14/09	6,976	County of Riverside
Bradley Road	Newport Road	5/09/09	11,763	County of Riverside
Chester Morrison	Bradley Road	9/06/07	9,731	County of Riverside
La Piedra Road	Antelope Road	5/14/09	8,693	County of Riverside
McCall Boulevard	Menifee Road	5/17/09	13,862	County of Riverside
Menifee Road	McCall Boulevard	5/17/09	10,891	County of Riverside
Newport Road	Bradley Road	5/06/09	27,129	County of Riverside
Pourroy Road	Auld Road	12/15/04	3,146	County of Riverside
Pourroy Road	Promontory Parkway	12/15/04	7,323	County of Riverside
State Street	Domenigoni Parkway	2006	13,635	City of Hemet
Cottonwood Avenue	West of Sanderson	5/06	3,984	City of San Jacinto
Cottonwood Avenue	East of Sanderson	5/06	7,190	City of San Jacinto

[1] ADT = Average Daily Traffic

Data used for this section were obtained from various sources. Full bibliographical entries for all reference material are contained at the end of this section.

Environmental Impact Analysis

Threshold Criteria

The following thresholds of significance are based on Appendix G of the 2009 State CEQA Guidelines. For purposes of this EIR, implementation of the proposed project may have a significant adverse impact on transportation/traffic if it would:

- Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian paths, and mass transit.

- Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures or other standards established by the county congestion management agency for designated roads or highways.

- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.

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

- Result in inadequate emergency access.

- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Environmental Analysis

Potential Impact. Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian paths, and mass transit.

Neither construction nor operation of the proposed Project would conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation

system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian paths, and mass transit. However, construction of the proposed Project has the potential to cause significant impacts to traffic circulation and access as a result of decreased road capacity and temporary lane closures. Construction of the pipelines could impact traffic on all those streets shown previously in Table 2-1. Construction activities would also temporarily damage roads; however, trenches would be patched or repaved following construction.

Significance of Impact:

Potentially significant.

Mitigation Measures:

The following mitigation measures should be complied with to reduce the traffic/transportation impacts:

- Traffic control plans shall be prepared by a qualified professional engineer prior to construction.
- Traffic control plans shall consider the ability of alternative routes to carry additional traffic and identify the least disruptive hours of construction site truck access routes and the type and location of warning signs, lights and other traffic control devices. Consideration shall be given to maintaining access to commercial parking lots, private driveways and sidewalks, bikeways and equestrian traffic to the greatest extent possible.
- Traffic control plans shall comply with Part 6 of the California Manual on Traffic Control Devices as determined by each affected local agency to minimize any traffic and pedestrian hazards that exist during project construction.
- Encroachment permits for all work within public rights-of-way shall be obtained from each involved agency prior to commencement of any construction. EMWD shall comply with all traffic control requirements of the affected local agencies.
- As required by local jurisdictions, the proposed pipelines shall be jacked under select major intersections to avoid traffic disruption and congestion.
- Public streets shall be kept operational during construction, particularly during the morning and evening peak hours of traffic. Lane closures shall be minimized during peak traffic hours.
- Public streets shall be restored to a condition mutually agreed to between EMWD and the local jurisdictions prior to construction.

- EMWD shall attempt to schedule construction to occur jointly with other public works projects already planned in the affected locations, through careful coordination with all local agencies involved.

Potential Environmental Effects of Measures:

All physical improvements or activities that could result in changes to the physical environment required by these mitigation measures would be located within areas evaluated elsewhere in this EA/DEIR. The impacts of implementing such measures, if any, would be similar to those identified for the project in Sections 3 through 18 of this EA/DEIR.

Level of Significance After Mitigation:

Implementation of the above mitigation measures would reduce the impacts to a level of less than significant.

Potential Impact. Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures or other standards established by the county congestion management agency for designated roads or highways.

The proposed Project would not conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures or other standards established by the county congestion management agency for designated roads or highways. Therefore, no impacts are anticipated and no mitigation is required.

Significance of Impact:

No Impact.

Mitigation Measure:

None required.

Potential Impact. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.

The proposed Project would not result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.

Significance of Impact:

No Impact.

Mitigation Measure:

None required.

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

The proposed Project would not substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment) due to the fact that it will not change the design of any highway or street.

Significance of Impact:

No Impact.

Mitigation Measure:

None required.

Potential Impact. Result in inadequate emergency access.

Implementation of the Project would not result in inadequate emergency access.

Significance of Impact.

No impact.

Mitigation Measure:

None required.

Potential Impact. Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

The proposed Project would not conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities. Therefore, no impacts are anticipated and no mitigation is required.

Significance of Impact.

No impact.

Mitigation Measure:

None required.

References

Caltrans. www.dot.ca.gov (3/19/10).

City of Hemet. cityofhemet.com (3/19/10).

City of San Jacinto. ci.san-jacinto.ca.us (3/19/10).

County of Riverside. www.countyofriverside.us (3/19/10).

State of California. 2009. *Title 14 California Code of Regulations, Chapter 3, Guidelines for Implementation of the California Environmental Quality Act.* December 29.

18 Utilities and Service Systems

Environmental Setting

Several entities provide utilities and service systems within the Project area. These are:

Utility	Provider
Water	Eastern Municipal Water District Lake Hemet Municipal Water District City of Hemet City of Perris City of San Jacinto
Wastewater	Eastern Municipal Water District City of Hemet City of Perris City of San Jacinto
Electricity	Southern California Edison City of Moreno Valley
Natural Gas	The Gas Company
Telephone	AT&T Verizon
Cable	Time Warner
Trash and Recycling	Waste Management CC&R City of Hemet City of Moreno Valley

Data used for this section were obtained from various sources. Full bibliographical entries for all reference material are contained at the end of this section.

Environmental Impact Analysis

Threshold Criteria

The following thresholds of significance are based on Appendix G of the 2009 State CEQA Guidelines. For purposes of this EA/DEIR, implementation of the proposed Project may have a significant adverse impact on utilities and service systems if it would:

- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.
- Require or result in the construction of new water or wastewater treatment facilities, the construction of which could cause significant environmental effects.
- Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.
- Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed.
- Result in a determination by the wastewater treatment provider that serves or may serve the project's projected demand in addition to the provider's existing commitments.
- Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs.
- Comply with federal, state, and local statutes and regulations related to solid waste.

Environmental Analysis

Potential Impact. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.

The Project would not generate any wastewater.

Significance of Impact:

No Impact.

Mitigation Measure:

None required.

Potential Impact. Require or result in the construction of new water or wastewater treatment facilities, the construction of which could cause significant environmental effects.

EMWD's existing regional water reclamation facilities have the capacity to supply the Recycled Water Pipeline Expansion Project. Consequently, no additional treatment facilities will be required to serve the proposed Project.

Significance of Impact:

No Impact.

Mitigation Measure:

None required.

Potential Impact. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

The Project would not require additional storm water facilities.

Significance of Impact:

No Impact.

Mitigation Measure:

None required.

Potential Impact. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed.

EMWD has sufficient water supplies and entitlements to serve the proposed Project.

Significance of Impact:

No Impact.

Mitigation Measure:

None required.

Potential Impact. Result in a determination by the wastewater treatment provider that serves or may serve the project's projected demand in addition to the provider's existing commitments.

The Project would not require wastewater service.

Significance of Impact:

No Impact.

Mitigation Measure:

None required.

Potential Impact. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs.

The Project would not require solid waste service.

Significance of Impact:

No Impact.

Mitigation Measure:

None required.

Potential Impact. Comply with federal, state, and local statutes and regulations related to solid waste.

The Project would not require solid waste service.

Significance of Impact:

No Impact.

Mitigation Measure:

None required.

References

City of Hemet. www.cityofhemet.org. (3/23/10).

City of Moreno Valley. www.moreno-valley.ca.us (3/23/10).

City of Perris. www.cityofperris.org. (3/23/10).

City of San Jacinto. www.ci.san-jacinto.ca.us. (3/23/10).

State of California. 2009. *Title 14 California Code of Regulations, Chapter 3, Guidelines for Implementation of the California Environmental Quality Act.* December 29.

19 Other Environmental Considerations

Significant Unavoidable Adverse Effects

The following discussion is intended to fulfill the requirements of §15126.2(b) of the State CEQA Guidelines that states:

> *Describe any significant impacts, including those which can be mitigated but not reduced to a level of insignificance. Where there are impacts that cannot be alleviated without imposing an alternative design, their implications and the reasons why the project is being proposed, notwithstanding their effect, should be described.*

A significant impact, or significant effect on the environment, is defined in §15382 of the State CEQA Guidelines as:

> *Significant effect on the environment means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. An economic or social change related to a physical change may be considered in determining whether the physical change is significant.*

The environmental effects of the Recycled Water Pipeline Distribution Expansion Project are discussed in detail under the appropriate headings in Chapters 3 through 18 of this EA/DEIR. All of the impacts identified in those chapters as potentially significant can be mitigated to a level of insignificance through implementation of the mitigation measures described in those same chapters with the exception of the cumulative impacts associated with oxides of nitrogen emissions during construction.

As shown in Chapter 5 of this EA/DEIR, the oxides of nitrogen emissions for each individual sub-project (43 pounds per day) are less than the significance criteria established by the SCAQMD (i.e., 100 pounds per day). However, should three or more of the sub-projects be constructed at the same time, the oxides of nitrogen significance criteria would be exceeded and therefore cause a potentially significant air quality impact. There are no feasible alternatives or mitigation measures to reduce this potentially significant air quality impact.

Before, the Board of Directors can approve the Project it must consider the benefits of the Project versus the adverse significant impacts that have not been avoided or substantially lessened to “less than significant” levels through mitigation. During the consideration process, the Board of Directors must determine that the benefits of the Project outweigh the unmitigated adverse impacts and the Project should be approved. The Board of Directors must also find that to the extent that the identified significant adverse impacts have not been avoided or substantially lessened, there are specific economic, legal, social, technological or other considerations that support approval of the Project.

Significant Irreversible Environmental Changes

The following discussion is intended to fulfill the requirements of §15126.2(c) of the CEQA Guidelines that states:

> *Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.*

During construction, the use of energy resources (e.g., fuel for construction equipment) would essentially be irreversible and irretrievable. However, this would not be considered a significant impact.

Growth-Inducing Impacts

The following discussion is intended to fulfill the requirements of §15126.2(d) of the CEQA Guidelines that states:

> *Discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a wastewater treatment plant might, for example, allow for more construction in service areas). Increases in population may further tax existing community service facilities so consideration must be given to this impact. Also discuss the characteristic of some projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.*

The goals and objectives of the Recycled Water Pipeline Distribution Expansion Project are to:

- Decrease the amount of recycled water that cannot be beneficially used within EMWD's service area.
- Increase the amount of recycled water that can be beneficially used thereby decreasing the amount of potable water that is currently being used for non-potable uses.
- Decrease the amount of imports from the State Water Project and Colorado River Aqueduct.

- Improve the reliability of landscape irrigation water supplies.

Although it could be construed that the increased use of recycled water would increase the volume of potable water available to the area, growth issues have been analyzed in separate CEQA documents by the Southern California Association of Governments, County of Riverside, City of Hemet, City of Moreno Valley, City of Perris and City of San Jacinto for the area and have deemed that the impacts associated with growth to be less than significant.

Effects Not Found to be Significant

§15128 of the CEQA Guidelines states:

> *An EIR shall contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant and were therefore not discussed in detail in the EIR. Such a statement may be contained in an attached copy of an Initial Study.*

As shown in Chapters 3 through 18 of this document, several potential environmental effects associated with the Recycled Water Pipeline Distribution Expansion Project were deemed not to be significant.

Cumulative Impacts

§15130(a) of the CEQA Guidelines states in part:

> *An EIR shall discuss cumulative impacts of a project when the projects incremental effect is cumulatively considerable as defined in §15065(a)(3). Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable", a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable.*

As previously stated in Section 2, the Recycled Water Pipeline Distribution Expansion Project consists of five sub-projects:

- Diamond Valley
- Menifee
- French Valley
- Moreno Valley/Perris North
- San Jacinto

Should three or more of these sub-projects be constructed at the same time, the air quality impacts would be significant as shown in Table 19-1. As shown in Table 19-1, the oxides of nitrogen emissions could exceed SCAQMD's construction-related thresholds of significance under this scenario.

Table 19-1
Total Estimated Construction Emissions
(pounds per day)

	ROG	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Emissions per Sub-Project								
Construction Equipment	5	19	43	0	2	2	5,422	0
Worker Commutes	0	2	0	0	0	0	329	0
Fugitive Dust	0	0	0	0	1	0	0	0
Subtotal	5	21	43	0	3	2	5,751	0
Estimated Emission from Two Sub-Projects being Constructed at the Same Time								
Construction Equipment	10	38	86	0	4	4	10,844	0
Worker Commutes	0	4	0	0	0	0	758	0
Fugitive Dust	0	0	0	0	2	0	0	0
Subtotal	10	42	86	0	6	4	11,602	0
Estimated Emissions from Three Sub-Projects being Constructed at the Same Time								
Construction Equipment	15	57	**129**	0	6	6	16,266	0
Worker Commutes	0	6	0	0	0	0	987	0
Fugitive Dust	0	0	0	0	3	0	0	0
Subtotal	15	63	**129**	0	9	6	17,253	0
Estimated Emissions from Four Sub-Projects being Constructed at the Same Time								
Construction Equipment	20	76	**172**	0	8	8	21,688	0
Worker Commutes	0	8	**0**	0	0	0	1,316	0
Fugitive Dust	0	0	**0**	0	4	0	0	0
Subtotal	20	84	**172**	0	12	8	23,004	0
Estimated Emissions from Five Sub-Projects being Constructed at the Same Time								
Construction Equipment	25	95	**215**	0	10	10	**27,110**	
Worker Commutes	0	10	0	0	0	0	1,645	
Fugitive Dust	0	0	0	0	5	0	0	
Subtotal	25	105	**215**	0	15	10	**28,755**	
Threshold Limits[1]	75	550	100	150	150	55	25,385	N/A

[1] Threshold limits developed by SCAQMD to determine significance of construction. The carbon dioxide threshold is based on SCAQMD's suggested criteria for determining significance of residential/commercial projects based on 260 working days in a year (i.e., 3,000 MT per year).

Red entries in above table indicate that the suggested criteria for significance are exceeded.

Greenhouse Gases (GHGs)

No agency has established quantitative significance thresholds for greenhouse gases at this time. However, SCAQMD has suggested significance screening levels of 10,000 MT per year CO_2 equivalents for industrial projects and 3,000 MT per year CO_2 equivalents for commercial/residential projects. Estimated construction duration and CO_2 emissions for each sub-project area are presented in Table 19-2.

Table 19-2
Estimated Carbon Dioxide (CO_2) Emissions from Construction

Sub-Project Area	Construction Days	Metric Tons/Day	Metric Tons/Year
Diamond Valley	120	2.614	314
Menifee	210	2.614	549
French Valley	100	2.614	261
Moreno Valley/Perris North	100	2.614	261
San Jacinto	100	2.614	261
Totals			1,646

Based on the information presented in Table 19-2, the total CO_2 emissions from construction of the individual Sub-Projects would be range from 261 MT per year to 549 MT per year. Therefore, the greenhouse gas emissions from construction of each Sub-Project would be considered less than significant. In the unlikely event that all five Sub-Projects were constructed at the same time, the CO_2 emission would be 1,646 MT per year which would also be considered less than significant based on SCAQMD's suggested screening level thresholds of 3,000 MT per year.

De Minimus Thresholds

A summary comparison of estimated emissions from construction of all five sub-projects at the same time, based on 260 working days per year, and "de minimus" thresholds is provided in Table 19-3.

Table 19-3
Comparison of Estimated Emissions from Construction and "De Minimis" Thresholds
(Tons per Year)

	CO	ROC	NO_x	SO_x	PM_{10}
Construction Emissions	7	2	16	0	1
"De Minimis" Thresholds	100	10	100	100	70

As can be seen by the data in Table 19-3, the estimated emissions from construction are well below the "de minimis" thresholds for the South Coast Air Basin. Therefore, an air quality conformity analysis is not required.

Economic and Social Effects

According to §15131 of the CEQA Guidelines, economic or social information may be included in an EIR or may be presented in whatever form the agency desires. §15131 of the CEQA Guidelines also states:

a) *Economic or social effects of a project shall not be treated as significant effects on the environment. An EIR may trace a chain of cause and effect from a proposed decision on a project through anticipated economic or social changes resulting from the project to physical changes caused in turn by the economic or social changes. The intermediate economic or social changes need not be analyzed to any detail greater than necessary to trace the cause and effect. The focus of the analysis shall be on the physical changes.*

b) *Economic or social effects of a project may be used to determine the significance of a physical change caused by a project. For example, if the construction of a new freeway or rail line divides an existing community, the construction would be the physical change, but the social effect on the community would be the basis for determining that the effect would be significant. As an additional example, if the construction of a road and the resulting increase in noise in an area disturbed existing religious practices, the disturbance of the religious practices could be used to determine that the construction and use of the road and the resulting noise would be significant effects on the environment. The religious practices would need to be analyzed only to the extent to show that the increase in traffic and noise would conflict with the religious practices. Where an EIR uses economic or social effects to determine that a physical change is significant, the EIR shall explain the reason for determining that the effect is significant.*

c) *Economic, social and particularly housing factors shall be considered by public agencies together with technological and environmental factors in deciding whether changes in a project are feasible to reduce or avoid the significant effects on the environment identified in the EIR. If information from these factors is not contained in the EIR, the information must be added to the record in some other manner to allow the agency to consider the factors in reaching a decision on the project.*

Socioeconomic resources include population and economic activity. Some related secondary components, such as housing availability and public services, are not considered in this analysis because the Project has no potential to generate measurable changes in population that will create demand from these resources.

Adverse socioeconomic impacts are not anticipated as a result of implementation of the Recycled Water Pipeline Distribution Expansion Project. The Project is designed to:

- Decrease the amount of recycled water that cannot be beneficially used within EMWD's service area.
- Increase the amount of recycled water that can be beneficially used thereby decreasing the amount of potable water that is currently being used for non-potable uses.
- Decrease the amount of imports from the State Water Project and Colorado River Aqueduct.
- Improve the reliability of landscape irrigation water supplies.

All of these aspects would be beneficial and result in positive socioeconomic impacts.

Short-term Uses vs Long-term Productivity

As previously stated, the environmental effects of the Recycled Water Pipeline Distribution Expansion Project are discussed in detail under the appropriate headings in Chapters 3 through 18 of this EA/DEIR.

All of the impacts identified in those chapters as potentially significant for individual sub-projects can be mitigated to a level of less than significant through implementation of the mitigation measures described in those same chapters. In addition, fuel, materials and human energy utilized to construct the Project would be considered irreversible commitments of resources although this commitment is considered less than significant.

Also as stated above, the Project is designed to:

- Decrease the amount of recycled water that cannot be beneficially used within EMWD's service area.
- Increase the amount of recycled water that can be beneficially used thereby decreasing the amount of potable water that is currently being used for non-potable uses.
- Decrease the amount of imports from the State Water Project and Colorado River Aqueduct.
- Improve the reliability of landscape irrigation water supplies.

All of these aspects would be beneficial and result in long-term productivity which greatly outweighs the short-term uses of the environment.

Indian Trust Assets

Indian Trust Assets (ITAs) are legal interests in property held in trust by the United States for Indian Tribes or individuals. The Secretary of the Interior, acting as the trustee, holds many assets in trust. Examples of objects that may be trust assets are lands, minerals, hunting and fishing rights, and water rights. While most ITAs are on reservations, they may also be found off-reservations. The United States has an Indian trust responsibility to protect and maintain rights reserved by or granted to Indian Tribes or Indian individuals by treaties, statutes, and executive orders. These are sometimes further interpreted through court decisions and regulations.

Tribal lands are lands that have been deeded to tribes or upon which tribes have a historical claim. There are no such lands within the immediate Project area; however, the Soboba Indian Reservation is immediately east of the Project area.

The Bureau of Indian Affairs (BIA) is the oldest bureau of the U.S. Department of the Interior. Established in 1824, BIA currently provides services (directly or through contracts, grants or compacts) to approximately 1.7 million American Indians and Alaskan Natives. BIA's mission is to:

> *…enhance the quality of life, to promote economic opportunity, and to carry out the responsibility to protect and enhance the trust assets of American Indians and Alaskan Natives.*

In his August 22, 2008 letter to Keith S. Dunbar, P.E., regarding the Recycled Water System Pressurization and Expansion Project, James J. Fletcher, Superintendent, Southern California Agency, Bureau of Indian Affairs stated:

> *Since it appears this project does not affect groundwater quality and only serves to conserve groundwater quantity, all groundwater rights issues are avoided. For this particular proposed project the Bureau of Indian Affairs does not have any particular statutory responsibilities.*

Consequently, the Recycled Water Pipeline Distribution Expansion Project which is a refinement of the Pressurization and Enhancement Project would not have any adverse impacts on Indian Trust Assets.

Environmental Justice

Executive Order 12898, Federal Activities to Address Environmental Justice in Minority Populations and Low-Income Populations, dated February 11, 1994, requires agencies to identify and address disproportionately high and adverse human health or environmental effects of their actions on minorities and low-income populations and communities as well as the equity of the distribution of the benefits and risks of their decisions. Environmental justice addresses the fair treatment of people of all races and incomes with respect to actions affecting the environment. Fair treatment implies that no group of people should bear a disproportionate share of negative impacts from an environmental action.

To comply with the environmental justice policy established by the Secretary, all U.S. Department of the Interior agencies are to identify and evaluate any anticipated effects, direct or indirect, from the proposed project, action, or decision on minority and low-income populations and communities, including the equity of the distribution of the benefits and risks.

In addition, California Senate Bill 115 (Solis) (Government Code Section 65040.12 (c)) established the Governor's Office of Planning and Research (OPR) as the coordinating agency in State government for environmental justice programs. As defined by SB 115, environmental justice is "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation and enforcement of environmental laws and policies."

Under the legislation, the following activities should be subjected to Environmental Justice review by approving agencies:

- Determination of or underwriting land use decisions,
- Approval of permitting decisions,
- Creation or adoption of regulations that may impact the environment or environmental laws or policies,

- Engaging in public interactions that may result in impacts to the environment or upon environmental laws or polices,
- Approving funds for activities that may impact the environment or environmental laws or policies, or
- Initiating discretionary decisions actions that may have impacts on the environment or upon environmental laws or policies.

In addition to the State's environmental justice requirements for State agencies, many state and local government agencies have additional responsibilities under Title VI of the Civil Rights Act (42 USC Section2000d). Title VI requires recipients of federal funds to conduct their activities and/or programs in a nondiscriminatory manner. Many of the programs and activities described above are funded, at least in part, with federal funds.

Most frequently, adverse environmental justice effects have been associated with environmental insults thrust upon communities involving the siting or continued existence of operations involving the use, manufacture, storage, or disposal of hazardous materials. Another common form of insult is the development of environmentally beneficial benevolent projects that impose aesthetic or use limitation burdens upon selected communities or neighborhoods. The proposed Project is not expected to involve either of these actions. Consequently, no environmental justice impacts are anticipated with implementation of the Recycled Water Pipeline Distribution Expansion Project.

Noxious Weeds

Public Law 93-620 (7 USC 2801 et seq.: 88 Stat. 2148) enacted January 3, 1975, established a federal program to control the spread of noxious weeds. Under this law, the Secretary of Agriculture was given the authority to designate plants as noxious weeds by regulation, and the movement of all such weeds in interstate or foreign commerce was prohibited except under permit. The Secretary was also given authority to inspect, seize, and destroy products and to quarantine areas, if necessary, to prevent the spread of such weeds. In addition, the Secretary was authorized to cooperate with other federal, state, and local agencies; farmers associations; and private individuals in measures to control, eradicate, or prevent the spread of such weeds.

Section 1453 of Public Law 101-624 (aka the 1990 Farm Bill), enacted November 26, 1990 (104 Stat. 3611), amended the Noxious Weed Act by requiring each federal land managing agency to : 1) designate an office or person adequately trained in managing undesirable plant species to develop and coordinate a program to control such plants on the agency's lands; 2) establish and adequately fund this plant management program through the agency's budget process; and 3) complete and implement cooperative agreements (requirements for which are provided) with each state regarding undesirable plants on agency land and establish integrated management systems (as defined in the section) to control or contain undesirable plants targeted under the cooperative agreements. The law also requires

that any environmental assessments or impact statements that may be required to implement plant control agreements must be completed within one year of the time the need for the document is established.

In addition, the California Department of Food and Agriculture (CDFA) and the California Exotic Pest Plant Council (CalEPPC) are involved in noxious weed identification and eradication. The CDFA focuses on non-public lands and the CalEPPC focuses on state-owned lands. The CDFA identifies plant species that are of particular concern in California due to their invasiveness and potential to spread explosively. The CDFA areas of concern are rangelands and agricultural weeks. The CDFA's A-list species are typically the only noxious weed species targeted for eradication by the CDFA. According to the California Food and Agriculture Code, in some cases, landowners may be liable for the cost of eradication of these or other infestations deemed as a nuisance by the County Agriculture Commissions.

In comparison to CDFA, the CalEPPC is not a federal or California regulatory agency and it focuses on natural areas that support native ecosystem, such as state and local parks and forests. CalEPPC defines "noxious weeds" as "…aggressive pest plants that displace native plants and natural habitats…" and maintains a separate list from the CDFA for "exotic pest plants of greatest ecological concern in California". This list is based on information from CalEPPC members, land managers and botanists throughout California, as well as published research.

The proposed pipelines would be within public street rights-of-way; therefore, noxious weeds should not be a concern with this Project.

20 Alternatives to the Proposed Action

Introduction

Section 15126.6 of the CEQA Guidelines requires all EIR's to consider and discuss alternatives to the proposed project. That section states:

a) *Alternatives to the Proposed Project. An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation. The lead agency is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives. There is no ironclad rule governing the nature or scope of the alternatives to be discussed other than the rule of reason.*

b) *Purpose. Because an EIR must identify ways to mitigate or avoid significant effects that a project may have on the environment (Public Resources Code Section 21002.1), the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly.*

c) *Selection of a range of reasonable alternatives. The range of potential alternatives to the proposed project shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or significantly lessen one or more of the significant effects. The EIR should briefly describe the rationale for selecting the alternatives to be discussed. The EIR should also identify any alternatives that were considered by the lead agency but were rejected as infeasible during the scooping process and briefly explain the reasons underlying the lead agency's determination. Additional information explaining the choice of alternatives may be included in the administrative record. Among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: (i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts.*

d) *Evaluation of alternatives. The EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison. If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant*

effects of the alternative shall be discussed, but in less detail than the significant effects of the project as proposed.

e) "No Project" Alternative.

- *The specific alternative of "no project" shall also be evaluated along with the impact. The purpose of describing and analyzing a no project alternative is to allow decision-makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project. The no project alternative analysis is not the baseline for determining whether the proposed project's environmental impacts may be significant, unless it is identical to the existing environmental setting analysis which does establish that baseline (see Section 15125).*

- *The "no project" analysis shall discuss the existing conditions at the time of the notice of preparation is published, or if no notice of preparation is published, at the time the environmental analysis is commenced, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services. If the environmentally superior alternative is the "no project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives.*

f) Rule of Reason. The range of alternatives required in an EIR is governed by a "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project. The range of feasible alternatives shall be selected and discussed in a manner to foster meaningful public participation and informed decision making.

Project Purpose and Objectives

The goals and objectives of the Recycled Water Distribution Pipeline Expansion Project are to:

- Decrease the amount of recycled water that cannot be beneficially used within EMWD's service area.

- Increase the amount of recycled water that can be beneficially used thereby decreasing the amount of potable water that is currently being used for non-potable uses.

- Decrease the amount of imports from the State Water Project and Colorado River Aqueduct.

- Improve the reliability of landscape irrigation water supplies.

Significant Effects

All significant impacts associated with the proposed project can be reduced to a level of less than significant with the exception of the oxides of nitrogen emissions during construction if three or more sub-projects are constructed at the same time.

No Project Alternative

The No Project Alternative would include maintaining the status quo. In other words, there would be no construction of new facilities. Implementation of the No Project Alternative would not allow EMWD to meet the project objectives outlined above. In addition, if EMWD does not undertake the proposed project, the following impacts can reasonably be expected to occur:

- As planned development increases, additional amounts of recycled water could not be used resulting in the net loss of an important water resource.

- New municipal customers would purchase potable water for their irrigation needs stressing supplies from the State Water Project and the Colorado River Aqueduct.

Alternative Means of Accomplishing Objectives

EMWD's proposed alternative means of accomplishing project objectives focus on ensuring that recycled water is developed as a water supply through the direct reuse of the water for the irrigation of municipal landscaping, industrial and environmental uses. Two alternative means of maximizing the use of EMWD's recycled water would be:

- The indirect reuse of recycled water as a potable water supply.

- The export of EMWD's recycled water to other water agencies interested in the indirect or direct reuse of the water.

These two alternative means of accomplishing the project objectives are explained in more detail in the following paragraphs.

Indirect Reuse

EMWD could achieve the same level of reuse as the proposed project by further treating the tertiary effluent produced by its Temecula Valley Regional Water Reclamation Facility to a level where it could be injected or percolated into high-quality groundwater subbasins and subsequently be extracted by wells for use as a potable water supply. Implementation of this alternative would not require EMWD to

upgrade its recycled water distribution system as the recharge water would be recovered and distributed through the potable water system.

The capital requirements for an indirect reuse project would include:

- Microfiltration.
- Reverse Osmosis.
- Injection Wells.
- Recovery Wells.
- Brine Disposal Facilities.

Such a project would be similar in nature to the Orange County Water District's Groundwater Replenishment System (GWRS). An EMWD system equivalent to the GWRS would be complicated by EMWD's multiple reclamation facilities and the much smaller size of EMWD's groundwater basins. Local conditions would probably require multiple pre-injection treatment plants and transmission pipelines to multiple well fields. However, even using the unit capital costs of the GRWS, it is apparent that the capital costs would be about an order of magnitude higher for this alternative than for the proposed project.

Recycled Water Export

Another potential option to ensure the reuse of recycled water would be to develop agreements with other agencies to purchase recycled water from EMWD. EMWD would not be required to provide "on demand" levels of service for its distribution system as it would be the responsibility of the purchasing agency to deliver the recycled water to its customers.

The major problem with this approach is that the purchasing agency would be required to make the capital investments that would allow it to use recycled water in-lieu of potable water. Therefore, it is unlikely that the purchasing agency could justify the investment in the recycled water distribution system unless it was able to purchase the water from EMWD at a cost far below the cost of potable water. It is therefore likely that EMWD would realize only a fraction of the revenue that it has obtained through sales to its own customers. Also, EMWD would be unable to realize the residual benefits of developing direct reuse of recycled water in its service area (i.e., groundwater stabilization from in-lieu use of recycled water).

EMWD currently has the ability to export recycled water to other downstream agencies in the Santa Ana River Watershed. However, no export agreements have been executed to date for the simple reason that if EMWD fails to develop direct reuse in its service area, the water will become available free of charge as EMWD is required to discharge more and more treated effluent to Temescal Creek.

EMWD could also explore construction of export pipelines to areas outside of its service area. However, in developed areas within a reasonable distance of EMWD's service area, local agencies are also rapidly developing water recycling programs using locally generated recycled water. It is also possible that the agricultural interests in eastern Riverside County and northern San Diego County could serve as potential markets for EMWD's recycled water. However, the infrastructure and operating costs of getting recycled water to these areas would be exorbitant.

Advantages of the Selected Alternative

In summary, EMWD selected the proposed project over the other alternatives because it would:

- Decrease the amount of recycled water that cannot be beneficially used within EMWD's service area.
- Increase the amount of recycled water that can be beneficially used thereby decreasing the amount of potable water that is currently being used for non-potable uses.
- Decrease the amount of imports from the State Water Project and Colorado River Aqueduct.
- Improve the reliability of landscape irrigation water supplies.

And most importantly, the proposed project is a logical continuation of EMWD's existing water recycling program and represents a low-risk, high-value opportunity to invest in the development of local water supplies and reduce dependence on stressed sources of imported water.

21 Persons and Organizations Consulted

Notice of Preparation Circulation

On February 26, 2010, K.S. Dunbar & Associates, Inc., EMWD's Environmental Consultant, mailed copies of the Notice of Preparation of an Environmental Assessment/Draft Environmental Impact Report and Attachment to those agencies, entities and individuals in the following list:

Federal Agencies

Karen Goebel, Assistant Field Supervisor
Ecological Services
Fish and Wildlife Service
U.S. Department of the Interior
6010 Hidden Valley Road
Carlsbad, California 92009

Forrest Vanderbilt, Project Manager
Regulatory Division
U.S. Army Corps of Engineers
Los Angeles District
Post Office Box 532711
Los Angeles, California 90053-2325

Doug McPherson, Environmental Specialist
Southern California Area Office
Bureau of Reclamation
U.S. Department of the Interior
27708 Jefferson Avenue, Suite 202
Temecula, California 92590

James J. Fletcher, Superintendent
Southern California Agency
Bureau of Indian Affairs
U.S. Department of the Interior
1451 Research Park Drive, Suite 100
Riverside, California 92507-2154

State Agencies

Scott Morgan, Acting Director
State Clearinghouse
Governor's Office of Planning and Research
Post Office Box 3044
Sacramento, California 95812-3044

Leslie MacNair
Senior Environmental Scientist
California Department of Fish and Game
Inland Deserts Region
3602 Inland Empire Boulevard, Suite C-220
Ontario, California 91764

Gerard Thibeault, Executive Officer
California Regional Water Quality Control Board,
Santa Ana Region
3737 Main Street, Suite 500
Riverside, California 92501-3339

John Robertus, Executive Officer
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Ct., Suite 100
San Diego, CA 92123-4340

Wayne Donaldson
Office of Historic Preservation
California Department of Parks and Recreation
Post Office Box 942896
Sacramento, California 94296-0001

Nadell Gayou
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Post Office Box 942836
Sacramento, California 94236-0001

Dave Singleton
Program Analyst
Native American Heritage Commission
915 Capitol Mall, Room 364
Sacramento, California 95814

Nathanial H. Pickett, Office Chief
Regional Planning, Riverside IGR/CEQA Review
California Department of Transportation
464 West Fourth Street, 6th Floor
San Bernardino, California 92401

Greg Holmes, Unit Chief
Southern California Cleanup Operations Branch
Cypress Regional Office
5796 Corporate Avenue
Cypress, California 90630-4732

Michelle Lobo
Environmental Scientist
Division of Financial Assistance
State Water Resources Control Board
P.O. Box 942212
Sacramento, California 94244-2120

Regional Agencies

Steve Smith, Ph.D.
Program Supervisor, CEQA Section
Planning, Rule Development & Area Sources
South Coast Air Quality Management District
Post Office Box 4939
Diamond Bar, California 91765-0939

County Agencies

Mr. Mark H. Wills
Chief of Regulatory Division
Riverside County Flood Control and Water Conservation District
1995 Market Street
Riverside, California 92501

Juan C. Perez, P.E., T.E.
Department of Transportation
County of Riverside
Post Office Box 1090
Riverside, California 92502-1090

Ron Goldman, Director
Planning Department
County of Riverside
Post Office Box 1409
Riverside, California 92501

City Agencies

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City of San Jacinto
Post Office Box 488
San Jacinto, California 92583-0488

Asher Hartel, Planning Director
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Roland Triersch, City Engineer
City of Hemet
445 E. Florida Avenue
Hemet, California 92543-4265

Richard Masyczek, Planning Director
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Perris, California 92570

Brad Eckhardt, Planning Manager
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Perris, California 92570-1998

Carmen Cave, Planning Director
City of Menifee
29714 Haun Road
Menifee, California 92586

Don Allison, P.E.
Director of Public Works/City Engineer
City of Menifee
29714 Haun Road
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John Terell, Planning Official
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Eric Lewis, P.E., T.E.
City Traffic Engineer
City of Moreno Valley
Post Office Box 88005
Moreno Valley, California 92562

Interested Entities

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Environmental Planning Team
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John Marcos, Chairman
Santa Rosa Band of Mission Indians
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Joe Ontiveros
Cultural Resources Department
Soboba Band of Luiseno Indians
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San Jacinto, California 92581-0487

Anna M. Hoover, Cultural Analyst
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Temecula, CA 92593-2183

Autumn Miller-DeWoody
Inland Empire WATERKEEPER
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Riverside, California 92503-4956

Ann L. Turner-McKibbon, President
Friends of Northern San Jacinto Valley
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Moreno Valley, California 92552-9097

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Southern California Edison
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Romoland, California 92585

Verizon – Executive Offices
CEQA Review
1 Baxter Way
Westlake, California 91362-3889

Kevin Kuennen
Environmental Specialist/Land Planner
Environmental Services
Southern California Gas Company
1981 W. Lugonia
Redlands, California92374-9720

Subsequently, on March 1, 2010, the State Clearinghouse and Planning Unit mailed copies of the NOP and Attachment to the following State agencies:

- Resources Agency
- Office of Historic Preservation
- Department of Parks and Recreation
- Department of Water Resources
- Department of Fish and Game, Region 6
- Department of Public Health
- Native American Heritage Commission
- California Highway Patrol
- Caltrans, District 8
- State Water Resources Control Board, Division of Financial Assistance
- State Water Resources Control Board, Division of Water Quality
- Department of Toxic Substances Control

Responders to the Notice of Preparation

During the 30-day comment period which ended on March 31, 2010, the following agencies, entities and individuals responded to the Notice of Preparation:

Scott Morgan, Acting Director
State Clearinghouse and Planning Unit
Governor's Office of Planning and Research
Post Office Box 3044
Sacramento, California 95812-3044

Daniel Kopulsky
Office Chief
Community Planning, IGR/CEQA Review
California Department of Transportation, District 8
464 West 4th Street, 6th Floor, MS 725
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Greg Holmes, Unit Chief
Brownfields and Environmental Restoration Program
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5796 Corporate Avenue
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Dave Singleton, Program Analyst
Native American Heritage Commission
915 Capitol Mall, Room 364
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Lisa Lee, Environmental Scientist
Division of Financial Assistance
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City of San Jacinto
595 S. San Jacinto Avenue
San Jacinto, California 92583

Joseph Ontiveros
Soboba Cultural Resources Department
Post Office Box 487
San Jacinto, California 92581

EMWD's Responses to Comments on Notice of Preparation

Copies of the actual comment letters received on the Notice of Preparation are included in Appendix B of this document. Summaries of the comment letters and Eastern Municipal Water District's responses follow:

Governor's Office of Planning and Research

In his March 1, 2010 letter to the Reviewing Agencies, Scott Morgan, Acting Director, State Clearinghouse and Planning Unit, assigned the project State Clearinghouse No. 2010031001 and established a public review period of 30 days which ended on March 31, 2010.

Response:

No response is required to this informational comment.

California Department of Transportation

In his March 3, 2010 letter to Keith S. Dunbar, Daniel Kopulsky, Office Chief, Community Planning, IGR/CEQA Review, District 8, California Department of Transportation stated:

The Menifee sub-project area includes sites that directly abut and/or traverse Interstate 215 (I-215) and State Route 74 (SR-74). Pipeline ID# M1 is located on Antelope Road from La Piedra Road to Holland Road, parallel to the east portion of I-215; Pipeline ID# M7 traverses I-215; and Pipeline ID# M11 is located on Antelope Road from McLaughlin road to the north of SR-74, and directly abuts SR-74. All comments herein are applicable to these locations.

Response:

No response is required to this informational comment.

The NOP indicates that construction activities may disrupt traffic due to lane closures along the pipeline alignments. If any construction activities result in major lane closures, which are expected to result in alignment traffic impacts, and/or a Significant Traffic Impact, which is an individual traffic delay of 30 minutes or more above normal recurrent travel time on the existing facility, a Transportation Management plan may be required.

Response:

Traffic delays of 30 minutes or more above normal recurrent travel time on existing streets are not anticipated to occur. The crossing of I-215 and SR-74 would be completed by the jack and bore method to insure traffic impacts on these two facilities do not occur. In addition, traffic mitigation measures included in Section 17 of this EA/DEIR contain the following:

- Traffic control plans shall be prepared by a qualified professional engineer prior to construction.
- Traffic control plans shall consider the ability of alternative routes to carry additional traffic and identify the least disruptive hours of construction site truck access routes and the type and location of warning signs, lights and other traffic control devices. Consideration shall be given to maintaining access to commercial parking lots, private driveways and sidewalks, bikeways and equestrian traffic to the greatest extent possible.
- Traffic control plans shall comply with Part 6 of the California Manual on Traffic Control Devices as determined by each affected local agency to minimize any traffic and pedestrian hazards that exist during project construction.
- Encroachment permits for all work within public rights-of-way shall be obtained from each involved local agency prior to commencement of any construction. EMWD shall comply with all traffic control requirements of the affected local agencies.
- Public streets shall be kept operational during construction, particularly during the morning and evening peak hours of traffic. Lane closures shall be minimized during peak traffic hours.

- Public streets shall be restored to a condition mutually agreed to between EMWD and the local jurisdictions prior to construction.

Because the Menifee sub-project area will partake construction activities with the State right-of-way (R/W) an Encroachment Permit will be required. The applicant's environmental documentation must include such work in their project description and indicate that an encroachment permit will be needed. As part of the Encroachment Permit process, the developer must provide appropriate environmental approval for potential environmental impacts to State Highway R/W. Construction with the State R/W shall be in compliance to all current design standards, applicable policies, and construction practices.

Response:

Section 1 of this document lists the permits and/or project approvals required to implement this project. Caltrans is listed as requiring an encroachment permit. Section 2 of this document details the crossing of the two State facilities and the impacts associated with these two crossings are detailed in Section 17 of this document.

We recommend the reference of the Encroachment Permits Manual Chapter 600 Utility Permits for applicable requirements. This manual may be referenced at the following link:

http://www.dot.ca.gov/hq/traffops/devekopserv/permits/encroachment_permits/index.html.

In addition to the requirements set forth in the Encroachment Permits Manual, we also recommend referencing the Right-of-Way Manual Chapter 13 at:

http://www.dot.ca.gov/hq/eow/rowman/manual/

and the Project Development Procedures Manual Chapter 17 at:

http://www.doct.ca.gov/hq/oppd/pdpm/pdpmn.htm

Please contact the Encroachment Permits Department for additional information at:

Encroachment Permits Department
464 W 4th Street MS 619
San Bernardino, CA 92401-1400
(909) 383-4526
(909) 383-4224 (FAX)
http://www.dot.ca.gov/hq/traffops/developserv/permits

Response:

These documents have been reviewed and are listed in the references in Sections 17 and 23 of this document.

These recommendations are preliminary and summarize our review of materials provided for our evaluation. If this proposal is revised in any way, please forward appropriate information to this office so that updated recommendations for impact mitigation may be provided.

Response:

Mr. Kopulsky is on the mailing list to receive all notices regarding this Project.

Department of Toxic Substances Control

In his March 10, 2010 letter to Keith S. Dunbar, P.E., Greg Holmes, Unit Chief, Brownfields and Environmental Restoration Program – Cypress Office stated:

DTSC has the following comments:

1) *The EIR should identify the current or historic uses of the Project area that may have resulted in a release of hazardous wastes/substances, and any known or potentially contaminated sites within the proposed Project area. For all identified sites, the EIR should evaluate whether conditions at the site may pose a threat to human health or the environment. Following are the databases of some of the regulatory agencies:*

   - *National Priorities List (NPL): A list maintained by the United States Environmental Protection Agency (U.S. EPA).*
   - *EnviroStor: A database primarily used by the California Department of Toxic Substances Control, at www.Envirostor.dtsc.ca.gov.*
   - *Resource Conservation and Recovery Information System (RCRIS): A database of RCRA facilities that is maintained by U.S. EPA.*
   - *Comprehensive Environmental Response Compensation and Liability Information System (CERCLA): A database of CERCLA sites that is maintained by U.S. EPA.*
   - *Solid Waste Information System (SWIS): A database provided by the California Integrated Waste Management Board which consists of both open as well as closed and inactive solid waste disposal facilities and transfer stations.*
   - *Leaking Underground Storage Tanks (LUST)/Spills, Leaks, Investigations and Cleanups (SLIC). A list maintained by Regional Water Quality Control Boards.*
   - *Local Counties and Cities maintain lists for hazardous substances cleanup sites and leaking underground storage tanks.*

- *The United States Army Corps of Engineers, 911 Wilshire Boulevard, Los Angeles, California, 90017 (213) 452-3908, maintains a list of Formerly Used Defense Sites (FUDS).*

  Response:

  The above referenced databases and others were utilized during the preparation of the Hazards and Hazardous Materials section of the EA/DEIR. All databases that were consulted are listed in Chapter 9.

2) *The EIR should identify the mechanism to initiate any required investigation and/or remediation for any site that may be contaminated, and the government agency to provide appropriate regulatory oversight. If necessary, DTSC would require an oversight agreement in order to review such documents. Please see comment No. 11 below for more information.*

   Response:

   The Project site is not contaminated; therefore, no further investigation is necessary.

3) *All environmental investigations, sampling and/or remediation for a site should be conducted under a Workplan approved and overseen by a regulatory agency that has jurisdiction to oversee hazardous substance cleanup. The findings of any investigations, including any Phase I or II Environmental Site Assessment Investigations should be summarized in the document. All sampling results in which hazardous substances were found above regulatory standards should be clearly summarized in a table.*

   Response:

   The Project site is not contaminated; therefore, no further investigation is necessary.

4) *Proper investigation, sampling and remedial actions overseen by the respective regulatory agencies, if necessary, should be conducted in the Project area prior to the new development or any construction. All closure, certification or remediation approval reports by these agencies should be included in the EIR.*

   Response:

   The Project site is not contaminated; therefore, no further investigation is necessary.

5) *If buildings, other structures, asphalt or concrete-paved surface areas are being planned to be demolished, an investigation should also be conducted for the presence of other hazardous chemicals, mercury, and asbestos containing materials (ACMs). If other hazardous chemicals, lead-based paints (LBP) or products, mercury or ACMs are identified, proper precautions should be taken during demolition activities. Additionally, the*

contaminants should be remediated in compliance with California environmental regulations and policies.

Response:

None of these activities are planned as part of the Project.

6) *Project construction may require soil excavation or filling in certain areas. Sampling may be required. If soil is contaminated, it must be properly disposed and not simply placed in another location onsite. Land Disposal Restrictions (LDRs) may be applicable to such soils. Also, if the project proposes to import soil to backfill the areas excavated, sampling should be conducted to ensure that the imported soil is free of contamination.*

Response:

It will be necessary to excavate soil to construct the proposed facilities. However, based on the results of researching the databases and the prior use of the properties, it is not anticipated that soil at the sites would be contaminated. Clean sand could be imported to the site to be used as bedding material for the pipelines. EMWD's standard construction specifications require the contractor to provide suitable information that insures that the imported materials are contaminant free.

7) *Human health and the environment of sensitive receptors should be protected during all construction or demolition activities. If necessary a health risk assessment overseen and approved by the appropriate government agency should be conducted by a qualified health risk assessor to determine if there are, have been, or will be, any releases of hazardous materials that may pose a risk to human health or the environment.*

Response:

There are no sensitive receptors in the immediate vicinity of the Project site.

8) *If it is determined that hazardous wastes are, or will be, generated by the proposed operations, the wastes must be managed in accordance with the California Hazardous Waste Control Law (California Health and Safety Code, Division 20, Chapter 6.5) and the Hazardous Waste Control Regulations (California Code of Regulations, Title 22, Division 4.5). If it is determined that hazardous wastes will be generated, this facility should also obtain a United States Environmental Protection Agency Identification Number by contacting (800) 618-6942. Certain hazardous waste treatment processes or hazardous materials, handling, storage or uses may require authorization from the local Certified Unified Program Agency (CUPA). Information about the requirement for the authorization can be obtained by contacting your local CUPA.*

Response:

The proposed Project includes recycled water pipelines and appurtenances only. No hazardous waste would be generated by these facilities.

9) *If during construction/demolition of the project, the soil and/or groundwater contamination is suspected, construction/demolition in the area should cease and appropriate health and safety procedures should be implemented.*

Response:

EMWD's standard construction contract documents include such provisions.

10) *If the site was used for agricultural, livestock or related activities, onsite soils and groundwater might contain pesticides, agricultural chemical, organic waste or other related residue. Proper investigation, and remedial actions, if necessary, should be conducted under the oversight of an approved by government agency at the site prior to construction of the project.*

Response:

The site was not previously used for any of these activities.

11) *DTSC can provide guidance for cleanup oversight through an Environmental Oversight Agreement (EOA) for governmental agencies that are not responsible parties, or a Voluntary Cleanup Agreement (VCA) for private parties. For additional information on the EOA or VCA, please see www.dtsc.ca.gov/ SiteCleanup/Brownfields, or contact Ms. Maryam Tasnif-Abbasi, DTSC's Voluntary Cleanup Coordinator, at (714) 484-5489.*

Response:

No cleanup activities are anticipated at this site.

Native American Heritage Commission

In his March 17, 2010 letter to Keith Dunbar, P.E., Dave Singleton, Program Analyst stated:

> *The Native American Heritage Commission (NAHC) is the state 'trustee agency' pursuant to Public Resources Code §21070 designated to protect California's Native American Cultural Resources. (Also see Environmental Protection Information Center v. Johnson (1985) 170 Cal App. 3rd 604). The California Environmental Quality Act (CEQA – CA Public Resources Code §21000-21177, amended in 2009) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archeological resources, is a 'significant effect' requiring the*

preparation of an Environmental Impact Report (EIR) per California Code of Regulations §15064.5(b)(c)(f) (CEQA guidelines). Section 15382 of the 2007 CEQA Guidelines defines a significant impact on the environment as " a substantial, or potentially substantial, adverse change in an of physical conditions within an area affected by the proposed project, including … objects of historic or aesthetic significance." In order to comply with this provision, the lead agency is required to assess whether the project will have an adverse impact on these resources within the 'area of potential effect (APE)', and if so, to mitigate that effect. To adequately assess the project-related impacts on cultural resources, the Commission recommends the following

The Native American Heritage Commission did perform a Sacred Lands File (SLF) search in the NAHC SLF Inventory, established by the Legislature pursuant to Public Resources Code §5097.64(a) and Native American Cultural Resources ***were not identified*** *within the area of potential effect (APE), as described. However, there are Native American Cultural Resources in close proximity to the APE. Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries once a project is underway. Enclosed are the names of the nearest tribes and interested Native American individuals that the NAHC recommends as 'consulting parties', for this purpose, that may have knowledge of the religious and cultural significance of the historic properties in the project area (e.g., APE). We recommend that you contact persons on the attached list of Native American contacts. A Native American Tribe or Tribal Elder may be the only source of information about a cultural resource. Also, the NAHC recommends that a Native American Monitor or Native American culturally knowledgeable person be employed whenever a professional archaeologist is employed during the 'Initial Study' and in other phases of the environmental planning processes. Furthermore, we suggest that you contact the California Historic Resources information System (CHRIS) at the Office of Historic Preservation(OHP) Coordinator's office at (916) 653-7278, for referral to the nearest OHP Information Center of which there are 11.*

Consultation with tribes and interested Native American tribes and interested Native American individuals, as consulting parties, on the NAHC list should be conducted in compliance with the requirements of federal NEPA (42 USC 4321-4351) and section 106 and 4(f) of federal NHPA (16 USC 470[f], et seq), 36 CFR Part 800.3, the President's Council on Environmental Quality (CSO, 42 USC 4371 et seq) and NACPRA (25 USC 3001-3013), as appropriate. The 1992 Secretary of the Interior's Standards for the Treatment of Historic Properties were revised so that they could be applied to all historic resource types included in the National Register of Historic Places and including cultural landscapes.

Response:

The list of Native American Tribes and interested Native American individuals contacted by EMWD and its consultants during the planning process is included in Sections 7 and 21 of this document. The results of the search by the Eastern Information Center are provided in Appendix D of this document.

EMWD will continue to coordinate its efforts on this project with the Native American contacts shown previously.

Due to the fact that EMWD is pursuing federal financial assistance through the U.S. Bureau of Reclamation for this project, the Bureau is responsible for the Section 106 and 4(f) consultation.

Lead agencies should consider avoidance, as defined in Section 15370 of the California Environmental Quality Act (CEQA) when significant cultural resources could be affected by a project. Also, Public Resources Code Section 5097.98 and Health and Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery'. Discussion of these should be included in your environmental documents, as appropriate.

Response:

Appropriate mitigation measures are included in Section 7 of this document as well as in the Mitigation Monitoring and Reporting Program (Appendix E of this document).

The authority for the SLF record search of the NAHC Sacred Lands Inventory, established by the California Legislature, is California Public Resources Code §5097.94(a) and is exempt from the CA Public Records Act (c.f. California Government Code §6254.10). The results of the SLF search are confidential. However, Native Americans on the attached contact list are not prohibited from and may wish to reveal the nature of identified cultural resources/historic properties. Confidentiality of "historic properties of religious and cultural significance" may also be protected under Section 304 of the NHPA or at the Secretary of the Interior's direction, if not eligible for listing on the National Register of Historic Places. The Secretary may also be advised by the federal Indian Religious Freedom Act (cf 42 USC 1996) in issuing a decision on whether or not to disclose items of religious and/or cultural significance identified in or near the APE and possibly threatened by proposed project activity.

Response:

The above information is noted.

CEQA Guidelines Section 15064.5(d) requires the lead agency to work with the Native Americans identified by this Commission if the Initial Study identifies the presence or likely presence of Native American human remains within the APE. CEQA Guidelines provide for agreements with Native American, identified by the NAHC, to assure the appropriate and dignified treatment of Native American human remains and any associated grave liens. Although tribal consultation under the California Environmental Quality Act (CEQA, CA Public Resources Code Section 21000 – 21177) is advisory rather than mandated, the NAHC does request lead agencies to work with tribes and

interested Native American individuals as 'consulting parties', on the list provided by the NAHC in order that cultural resources will be protected. However, the 2006 SB 1059 the state enabling legislation to the Federal Energy Policy Act of 2005, does mandate tribal consultation for the electric transmission corridors. This is codified in California Public Resources Code, Chapter 4.3, and §25330 to Division 15, requires consultation with California Native American tribes and identifies both federally recognized and non-federally recognized on a list maintained by the NAHC.

Response:

Section 7 of this document, as well as the Mitigation Monitoring and Reporting Program (Appendix E of this document), contains appropriate mitigation measures for the inadvertent discovery of Native American human remains during construction.

There are no electric transmission corridors associated with this project. The project includes recycled water pipelines within public street rights-of-way.

Health and Safety Code §7050.5, Public Resources Code §5097.98 and §15064.5(d) of the CEQA Guidelines mandate procedures to be followed in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery until the county coroner or medical examiner can determine whether the remains are those of a Native American. Note that §7052 of the Health and Safety Code states that disturbance of Native American cemeteries is a felony.

Response:

The EA/DEIR did not identify the presence or likely presence of Native American human remains. However, in the unlikely event that they are found during construction activities, Chapter 7 of the EA/DEIR includes the appropriate mitigation measure.

Again, Lead agencies should consider avoidance, as defined in Section 15370 of the CEQA Guidelines, when significant cultural resources are discovered during the course of project planning and implementation.

Response:

There would be no anticipated impacts to cultural resources associated with implementation of the proposed project.

State Water Resources Control Board, Division of Financial Assistance

In her March 23, 2010 letter to Keith Dunbar, Lisa Lee, Environmental Scientist stated:

We would appreciate notice of any hearings or meetings held regarding environmental review of any projects to be funded by the State Water Board, and look forward to reviewing the draft Environmental Impact Report (EIR) for the Project. Once the EIR is certified, please provide the

following documents applicable to the Project: (1) Two copies of the draft and final EIR, (2) the resolution certifying the EIR, adopting a Mitigation Monitoring and Reporting Program (MMRP) and a State of Overriding Considerations, if applicable, and making California Environmental Quality Act (CEQA) findings, (3) all comments received during the review period and the District response to those comments, (4) the adopted final MMRP, and (5) a date stamped copy of the Notice of Determination filed with the Governor's Office of Planning and Research.

Response:

The State Water Board is on the mailing list to receive all notices regarding environmental review of this Project. Should EMWD apply for financial assistance from the State Water Board, it would provide the requested information as part of its application package.

The CWSRF Program is partially funded by the U.S. Environmental Protection Agency (USEPA) and requires additional "CEQA-Plus" environmental documentation and review. Four information sheets are included that further explain the environmental compliance process and additional federal requirements in the CWSRF Program. In addition, an evaluation form is included for the District to submit to the State Water Board Project Manager. The State Water Board can consult directly with agencies responsible for implementing federal environmental laws and regulations. Any environmental issues raised by federal agencies or their representatives must be resolved prior to State Water Board approval of a CWSRF funding commitment for the Project. For further information on the environmental compliance process in the CWRSF Program, please contact Ms. Michelle Lobo at (916) 341-6983.

Response:

Should EMWD elect to pursue CWSRF funding for this Project it will submit the appropriate documents to the State Water Board.

It is important to note that prior to a CWSRF funding commitment, projects are subject to provisions of the federal Endangered Species Act and must obtain approval from the U.S. Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Service (NMFS) for any potential effects to special status species. Please be advised that the State Water Board can consult with USFWS and NMFS on behalf of the District regarding all federal special-status species the Project has the potential to impact.

The District will need to identify whether the Project will involve any direct effects from construction activities or indirect effects, such as growth inducement, that may affect federally-listed threatened, endangered or candidate species that are known, or have a potential to occur on-site, in the surrounding areas, or in the service area, and to identify applicable conservation measures to reduce such effects.

Response:

As shown in Chapter 6, Biological Resources of this document, implementation of the Project will not have any adverse effects on federally-listed threatened, endangered or candidate species.

CWSRF projects must comply with Section 106 of the National Historic Preservation Act. The State Water Board has been delegated responsibility for caring out the requirements of Section 106 under a Nationwide Programmatic Agreement executed for the CWSRF Program by the USEPA, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers.

As stated above, the State Water Board has responsibility for ensuring compliance with Section 106 and the State Water Board's Cultural Resources Officer (CRO) consults directly with the California State Historic Preservation Officer (SHPO). SHPO consultation is initiated when sufficient information is provided by the CWSRF applicant for projects having potential impacts to cultural resources. Please contact the State Water Board CRO Ms. Cookie Hirn, at (916) 341-5690 with any questions on how to begin the Section 106 process. Note that the District will need to identify the Area of Potential Effects (APE) including construction areas, staging areas, and depth of any excavation.

Please provide the CRO with a copy of the current Records Search for the Project area, and include maps that show all recorded sites and surveys in relation to the APE for the Project. The APE is three-dimensional and includes all areas that may be affected by the Project. The APE includes the surface area and extends below ground to the depth of any Project excavations. The Records Search request should be made for an area larger than the APE. The appropriate area varies for different projects but should be drawn large enough to provide information on what types of sites may exist in the vicinity.

Native American and Interested Party Consultation are required for Section 106 compliance.

- *A Project description and map should be sent to the Native American Heritage Commission (NAHC). The NAHC will provide a list of Native American tribes and individuals that are culturally affiliated with your Project area and recommend that they all be contacted.*

- *A Project Description and map should be sent to everyone on the list provided by the NAHC asking for information on the Project area.*

- *Similar letters should be sent to local historical organizations.*

- *Follow-up contact should be made by phone and a phone log should be included.*

Comments from the NAHC, local tribes and historical organizations affiliated with the Project area, as well as the District response to these comments should be included in the submittal to the CRO.

Response:

All of the requested information is contained in Chapter 7 and Appendix D of this Draft EA/EIR.

Other federal requirements pertinent to the Project under the CWSRF Program include the following:

A. *Compliance with the federal Clean Air Act: (a) Provide air quality studies that may have been done for the Project; and (b) if the Project is in a nonattainment area of attainment area subject to a maintenance plan: (i) provide a summary of the estimated emissions (in tons per year) that are expected from both the construction and operation of the Project for each federal criteria pollutant in a non attainment or maintenance area, and indicate if the nonattainment designation is moderate, serious, severe, or extreme; (ii) if emissions are above the federal de minimus levels, but the Project is sized to meet only the needs of current population projections that are used in the approved State Implementation Plan for air quality, quantitatively indicate how the proposed capacity increase was calculated using population projections (See Code of Federal Regulations [40CFR93.1531)).*

Response:

All the requested information is contained in Chapter 5, Air Quality in this EA/DEIR. Emissions are well below federal de minimus levels and well within the range required for CWSRF projects (i.e., if a project's emissions are below the "de minimus" level and are less than 10% of the areas inventory specified for each criteria pollutant in a nonattainment or maintenance area, further general conformity analysis is not required.

B. *Compliance with the Wild and Scenic Rivers Act. Identify whether or not Wild and Scenic Rivers would be potentially impacted by the Project, and include conservation measures to minimize such impacts.*

Response:

There are no Wild and Scenic Rivers in the Project area.

C. *Compliance with the Migratory Bird Treaty Act (ACT): List any birds that are protected under this Act that may be impacted by the Project, and identify conservation measures to minimize such impacts.*

Response:

There are no birds that are protected under this Act that might be impacted by the Project (See Chapter 6, Biological Resources, in this EA.DEIR).

D. *Protection of Wetlands: Identify whether or not the Project or construction activities impact streams, flood control channels, or wetlands.*

Response:

The proposed 12-inch recycled water pipeline to be buried in the Chambers Avenue ROW is approximately 1,868 feet in length. If this pipeline crosses the ephemeral drainage that parallels the fence line, it would have to be jack and bored or a California Department of Fish and Game Streambed Alteration Agreement (SAA) would be required. Similarly, compliance with the federal Clean Water Act, section 404, for the placement of any non-structural fill material could be accomplished under the U.S. Army Corps of Engineers' Nationwide Permit No. 18 for Linear Utility Projects.

E. *Compliance with the Flood Plain Management Act. Identify whether the Project is within the 100-year flood zone. Include a flood map.*

Response:

All Project facilities would be underground and not affect the 100-year flood plain.

F. *Compliance with Farmland Protection Policy Act: Identify whether the Project will result in the conversion of farmland. State the status of farmland (Prime, Unique, or Local Statewide Importance) in the Project area and determine if this area is under a Williamson Act Contract.*

Response:

The Project sites are within public street rights-of-way and are not subject to local zoning ordinances. Additional information on farmland is provided in Chapter 4, Agricultural and Forest Resources of this EA/DEIR.

G. *Compliance with the Coastal Zone Management Act. Identify whether the Project is within a coastal zone and the status of any coordination with the California Coastal Commission.*

Response:

The Project is not within a coastal zone.

Following are specific comments on the NOP.

The State Water Board's web page has information on Low Impact Development (LID) that may be applicable to this Project. Identify any Project features (e.g., roads, parking lots, and other hard surfaces) that could benefit from LID practices. LID information can be located at www.waterboards.ca.ca.gtov/water_issues/programs/low_impact_development/.

Response:

The Project includes the installation of approximately 16.9 miles of recycled water pipeline, varying in size from 8 inches in diameter up to 24 inches in diameter, within public street rights-of-way. Therefore, low impact development would not benefit any of the Project features.

South Coast Air Quality Management District

In his March 9, 2010 letter to Keith S. Dunbar, P.E., BCEE, F. ASCE Ian MacMillan, Program Supervisor, CEQA Inter-Governmental Review, Planning, Rule Development & Area Sources stated:

The SCAQMD comments are recommendations regarding the analysis of potential air quality impacts from the proposed project that should be included in the draft environmental impact report (EIR). Please send the SCAQMD a copy of the Draft EIR upon its completion. ***In addition, please send with the draft EIR all appendices or technical documents related to the air quality analysis and electronic versions of all air quality modeling and health risk assessment files. Electronic files include spreadsheets, database files, input files, output files, etc., and does <u>not</u> mean PDF files. Without all files and supporting air quality documentation, the SCAQMD will be unable to complete its review of the air quality analysis in a timely manner. Any delays in providing the supporting air quality documentation <u>will require</u> additional time for review beyond the end of the comment period.***

Response:

SCAQMD is on the mailing list to receive the Draft EIR. It will also be sent the Excel spreadsheets that were used to calculate the air quality emissions.

<u>Air Quality Analysis</u>

The SCAQMD adopted its California Environmental Quality Act (CEQA) Air Quality Handbook in 1993 to assist other public agencies with the preparation of air quality analyses. The SCAQMD

recommends that the Lead Agency use this Handbook as guidance when preparing its air quality analysis. Copies of the Handbook are available from the SCAQMD's Subscription Services Department by calling (909) 396-3720. Alternatively, the lead agency may wish to consider using the California Air Resources Board (CARB) approved URBEMIS 2007 Model. This model is available on the SCAQMD Website at: www.urbemis.com.

Response:

EMWD's consultant utilizes the California Environmental Quality Act (CEQA) Air Quality Handbook and its amendments as well as the EMFAC2007 (version 2.3) emission factors in its air quality analysis. The URBEMIS 2007 Model is designed to analyze land development projects and is not directly applicable to such projects as the Recycled Water Distribution Pipeline Expansion Project.

The Lead Agency should identify any potential adverse air quality impacts that could occur from all phases of the project and all air pollutant sources related to the project. Air quality impacts from both construction (including demolition, if any) and operations should be calculated. Construction-related air quality impacts typically include, but are not limited to, emissions from the use of heavy-duty equipment from grading, earth-loading/unloading, paving, architectural coatings, off-road mobile equipment (e.g., heavy-duty construction equipment) and on-road mobile sources (e.g., construction worker vehicle trips, material transport trips). Operation-related air quality impacts may include, but are not limited to, emissions from stationary sources (e.g., boilers), area sources (e.g., solvents and coatings), and vehicular trips (e.g., on- and off-road tailpipe emissions and entrained dust). Air quality impacts from indirect sources, that is, sources that generate or attract vehicular trips should be included in the analysis.

Response:

All of the potential adverse air quality impacts and the above recommendations are discussed in Chapter 5, Air Quality in this document.

The SCAQMD has developed a methodology for calculating $PM_{2.5}$ emissions from construction and operational activities and processes. In connection with developing $PM_{2.5}$ calculation methodologies, the SCAQMD has also developed both regional and localized significance thresholds. The SCAQMD requests that the lead agency quantify $PM_{2.5}$ emissions and compare the results to the recommended $PM_{2.5}$ significance thresholds. Guidance for calculating $PM_{2.5}$ emissions and $PM_{2.5}$ significance thresholds can be found at the following internet address: http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html.

Response:

The recommended methodologies were utilized in developing the air quality analysis in Section 5 of this document.

In addition to analyzing regional air quality impacts the SCAQMD recommends calculating localized air quality impacts and comparing the results to localized significance thresholds (LSTs). LST's can be used in addition to the recommended regional significance thresholds as a second indication of air quality impacts when preparing a CEQA document. Therefore, when preparing the air quality analysis for the proposed project, it is recommended that the lead agency perform a localized significance analysis by either using the LST's developed by the SCAQMD or performing dispersion modeling as necessary. Guidance for performing a localized air quality analysis can be found at http://www,aqmd.ca.gov/ceqahandbookLST/LST.html.

Response:

The LST analysis is contained in Chapter 5, Air Quality, of this document.

In the event that the proposed project generates or attracts vehicular trips, especially heavy-duty diesel fueled vehicles, it is recommended that the lead agency perform a mobile source health risk assessment. Guidance for performing a mobile source health risk assessment ("Health Risk Assessment Guidance for Analyzing Cancer Risk from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis") can be found on SCAQMD's web page at the following internet address: http://www.aqmd.gov\ceqa\handbook/mobile_toxic/mobile_toxic.html. An analysis of all toxic air contaminant impacts due to the decommissioning or use of equipment potentially generating such air pollutant should also be included.

Response:

None of the above conditions apply to the proposed Project.

Mitigation Measures

In the event that the project generates significant adverse air quality impacts, CEQA requires that all feasible mitigation measures that go beyond what is required by law be utilized during project construction and operation to minimize or eliminate adverse air quality impacts. To assist the Lead Agency with identifying possible mitigation measures for the project, please refer to Chapter 11 of the SCAQMD CEQA Air Quality Handbook for sample air quality mitigation measures. Additional mitigation measures can be found on the SCAQMD's CEQA web pages at the following internet address: http://www/aqmd.ca.gov/ceqahandbook/mitigation/MM_intro.html. Additionally, SCAQMD's Rule 403 – Fugitive Dust, and the Implementation Handbook contain numerous measures for controlling construction-related emissions that should be considered for use as CEQA

mitigation if not otherwise required. Other measures to reduce air quality impacts from land use projects can be found in the SCAQMD's Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning. This document can be found at the following internet address: http://www.aqmd.ca.gov/prdas/aqguide/aqguide.html/. In addition, guidance on siting incompatible land uses can be found in the California Air Resources Board's Air Quality and Land Use Handbook, A Community Perspective, which can be found at the following internet address: heep://arb.ca.gov/ch/handbook.pdf. Pursuant to state CEQA Guidelines §15126.4(a)(1)(D), any impacts resulting from mitigation measures must also be discussed.

Response:

The recommended sources for mitigation were utilized in the development of Chapter 5, Air Quality in this document.

Data Sources

SCAQMD rules and relevant air quality reports and data are available by calling SCAQMD's Public Information Center at (909) 396-2039. Much of the information available through the Public Information Center is also available via the SCAQMD's World Wide Web Homepage (http://www.aqmd.gov).

The SCAQMD is willing to work with the Lead Agency to ensure that project-related emissions are adequately identified, categorized, and evaluated. Please call Ian MacMillan, Program Supervisor, CEQA Section, at (909) 396-3244 if you have any questions regarding this letter.

Response:

These sources as well as the California Air Resources Board's web site (www.arb.ca.gov) were used in the air quality analyses provided in Chapter 5 of this document.

Riverside County Flood Control and Water Conservation District

In his March 17, 2010 letter to Keith S. Dunbar, Kris Flanigan, Senior Civil Engineer stated:

The Riverside County Flood Control and Water Conservation District (District) is providing the following comments/concerns that should be addressed in the EA/DEIR:

1. *District facilities are located within the proposed project areas and may be impacted. Any project that involves District right-of-way, easements or facilities should be coordinated with us. To obtain further information on encroachment permits or existing facilities, contact Ed Lotz of the District's Encroachment Permit Section at 951.955.1266.*

Response:

Mr. Lotz will be contacted by the design team at the appropriate time during the design process.

2. *The proposed project is located within several District Master Drainage Plans (MDPs). When fully implemented, these MDP facilities will provide flood protection to relieve those areas within the plan of the most serious flooding problems and will provide adequate drainage outlets. The EA/DEIR should address impacts to MDP facilities within the proposed project area. The MDP maps can be viewed online at www.rcflood.org. To obtain further information on the current and future MDP and the proposed facilities, please contact Edwin Quinonez of the District's Planning Section at 951.955.1210.*

Response:

The MDP maps were reviewed during the preparation of Section 9, Hydrology and Water Quality in this document. In addition, Mr. Quinonez will be contacted by the design team at the appropriate time during the design process.

3. *The District is a signatory to the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). For purposes of procuring an encroachment permit from the District, the permit applicant will need to demonstrate that all portions of the project located with the District rights-of-way, easements or facilities are consistent with the MSHCP. The EA/EIR should include a MSHCP consistency assessment with all of its supporting documents and provide mitigation in accordance with all application MSHCP requirements. The assessment should address, at a minimum, Sections 3.2, 3.2.1, 6.1.2, 6.1.3, 6.1.4, 6.3.2, 7.5.3 and Appendix C of the MSHCP.*

Response:

The detailed consistency assessment will be presented to the District at the time of application of any required easements or encroachment permits.

City of Menifee

In her March 11, 2010 letter to Keith S. Dunbar, P.E., BCEE, F. ASCE, Lisa Sheldon, Senior Planner stated:

> *The DEIR should identify how impacts related to noise, dust, air quality, traffic and hazardous materials are mitigated for residential areas within the vicinity of new pipeline installation.*

Response:

Mitigation measures are provided in the topical sections of the EA/DEIR as well as the Executive Summary and the Mitigation Monitoring and Reporting Program.

In addition, the Planning Department is concerned with the amount of traffic the proposed project may generate during construction. The DEIR should identify that the City will require an encroachment permit for all work within the City's public right-of-way and a construction traffic management plan to mitigate impacts to traffic and circulation during construction.

Response:

A listing of all required permits to implement the Project is contained in Chapter 1 of this EA/DEIR. The City's encroachment permit is included in that listing. Mitigation measures contained in Chapter 17, Traffic/Transportation, the Executive Summary and the Mitigation Monitoring and Reporting Program require the preparation of a traffic management plan.

If import or export is proposed, haul routes should be identified and impacts associated with the haul of import and/or export to the surrounding community and residential should be analyzed. If haul routes are proposed within the City of Menifee, haul permits from the City will be required.

Response:

Materials (e.g., pipe, backfill and asphalt) will be delivered to each proposed pipeline alignment. In addition, a small amount of excavated materials (e.g., excess soil and pavement) will be removed from each site. The impacts associated with this are discussed in Chapter 19, Traffic/Transportation in this EA/DEIR. The City's requirement for haul permits is also included in Chapter 1 of this EA/DEIR.

City of Perris

In his March 26, 2010 Memorandum to Karen Hackett, EMWD and Keith Dunbar, K.S. Dunbar & Associates, Habib Motlagh, City Engineer stated:

Within the City of Perris, this project is proposed to include construction of a new recycled waterline along Indian Avenue from Morgan Street to the northerly city limit.

At this time we do not have any comments regarding the proposed scope of the EIR. We do offer the following general comments regarding this project:

- *There are many large industrial/commercial developments currently being considered along this pipeline corridor. EMWD should familiarize themselves with the construction schedule*

for these projects. In particular, EMWD should avoid constructing this pipeline immediately after any road widening and repaving by developers.

Response:

EMWD is aware of the many large industrial/commercial developments currently being considered in this area. One purpose of the Project is to provide recycled water for landscaping and/or industrial uses in this area. EMWD will attempt to coordinate its construction activities in this area to coincide with the construction and/or widening of Indian Avenue in this area.

- *Please be sure that plans for this project are carefully coordinated to avoid any future conflicts with drainage facilities proposed in the master drainage plan for North Perris.*

Response:

EMWD and its design team will continue to coordinate its design activities with the City of Perris and the Riverside County Flood Control and Water Conservation District.

City of San Jacinto

In his March 25, 2010 Memorandum to Karen Hackett, EMWD and Keith Dunbar, K.S. Dunbar & Associates, Habib Motlagh, City Engineer stated:

Within the City of San Jacinto, this project is proposed to include construction of a new recycled waterline along Cottonwood Avenue from Warren Road to just west of Lyon Avenue.

At this time we do not have any comments regarding the proposed scope of the EIR. We do offer the following general comments regarding this project:

- *Within the NOP, the figure showing the location of the pipeline along Cottonwood is labeled "Hemet Figure 6". This label may create confusion as to the jurisdiction in which the construction will take place. It should be changed so as not to refer to Hemet.*

Response:

EMWD has changed the name to San Jacinto to avoid any confusion.

- *Please be sure that plans for this project are carefully coordinated to avoid any future conflicts with drainage facilities proposed in the joint City/RCFC master drainage plans.*

Response:

EMWD and its design team will continue to coordinate its design activities with the City of San Jacinto and the Riverside County Flood Control and Water Conservation District.

Soboba Band of Luiseño Indians

In his March 8, 2010 letter to Keith S. Dunbar, P.E., F. ASCE, John Ontiveros, Soboba Cultural Resources Department stated:

Soboba Band of Luiseño Indians is requesting the following:

1) *Government to government consultation in accordance with SB18. Including the transfer of information to the Soboba Band of Luiseño Indians regarding the progress of this project should be done as soon as new developments occur.*

   Response:

   Based on EMWD's review of SB-18, *Local and Tribal Intergovernmental Consultation* it appears that it requires cities and counties to contact, and consult with "California Native American Tribes" before adopting or amending a General Plan, or when designating land as Open Space, for the purpose of protecting Native American Cultural Places. In addition, Special Districts, School Districts and Water Districts are specifically exempted from the provisions of SB-18. SB-18 is also not part of the CEQA statute.

2) *Soboba Band of Luiseño Indians continues to be a lead consulting tribal entity for this project.*

   Response:

   The Tribe is on the mailing list to receive all public notices and environmental review documents associated with this project.

3) *Working in and around traditional use areas intensifies the possibility of encountering cultural resources during the construction/excavation phase. For this reason the Soboba Band of Luiseño Indians request that Native American Monitor(s) from the Soboba Band of Luiseño Indians Cultural Resources Department be present during any ground disturbing proceedings. Including surveys and archeological testing.*

   Response:

   The proposed project is a pipeline project and trenching/excavation will be within previously disturbed public street rights-of-way. Therefore, there should be no impacts to cultural resources. However, should there be an inadvertent discovery of cultural resources, mitigation measures included in Chapter 7 are adequate to protect any cultural resources discovered.

4) *Requests that proper procedures be taken and request of the tribe be honored (Please see the attachment).*

Response:

As shown by the mitigation measures in Chapter 7 of the EA/DEIR and Mitigation Monitoring and Reporting Program, EMWD will comply with those items listed in the attachment (included in Appendix B to this document) with respect to cultural items (artifacts), treatment and disposition of remains, coordination with County Coroner's Office, and non-disclosure of location reburials.

Late Comments Received on NOP

Pechanga Band of Luiseño Indians

On April 2, 2010 an email was received from Anna Hoover, Cultural Analyst, Pechanga Cultural Resources, Temecula Band of Luiseño Indians submitting comments on the Notice of Preparation that were also dated April 2, 2010. Although EMWD does not have a legal obligation to respond to late comments, in the spirit of cooperation with the Pechanga Tribe, its responses to those comments follow (the actual comment letter is included in Appendix B of this EA/DEIR):

Thank you for inviting us to submit comments on the above named Project. This comment letter is written on behalf of the Pechanga Band of Luiseño Indians (hereinafter, "the Tribe"), a federally recognized Indian tribe and sovereign government. These comments are not being submitted in lieu of formal consultation under SB18, which will be required for this Project or under Section 106 if Bureau of Reclamation (BOR) funding is involved.

Response:

Based on EMWD's review of SB-18, *Local and Tribal Intergovernmental Consultation* it appears that it requires cities and counties to contact, and consult with "California Native American Tribes" before adopting or amending a General Plan, or when designating land as Open Space, for the purpose of protecting Native American Cultural Places. In addition, Special Districts, School Districts and Water Districts are specifically exempted from the provisions of SB-18. SB-18 is also not part of the CEQA statute.

Should the Bureau of Reclamation provide funding for this Project, it would initiate the Section 106 consultation process.

The Tribe is formally requesting, pursuant to Public Resources Code §21092.2, to be notified and involved in the entire CEQA environmental review process for the duration of the above referenced project (the "Project"). If you have not done so already, please add the Tribe to your distribution

list(s) for public notices and circulation of all documents, including environmental review documents, archeological reports, and all documents pertaining to this Project. The Tribe further requests to be directly notified of all public hearings and scheduled approvals concerning this Project. The Tribe also requests that these comments be incorporated into the record of approval for this Project as well.

Response:

The Tribe is on the mailing list to receive all public notices and environmental review documents associated with this project.

The Tribe submits these comments concerning the Project's potential impacts to cultural resources in conjunction with the environmental review of the Project. The Tribe reserves the right to fully participate in the environmental review process, as well as to provide further comment on the Project's impacts to cultural resources and potential mitigation for such impacts. Further, the Tribe reserves the right to participate in the regulatory process and provide comment on issues pertaining to the regulatory process and Project approval.

Response:

As stated above, the Tribe is on the mailing list to receive all public notices and environmental review documents associated with this project.

It has been the intent of the Federal Government[1] and the State of California[2] that Indian tribes be consulted with regard to issues which impact cultural and spiritual resources, as well as other governmental concerns. The responsibility to consult with Indian tribes stems from the unique government-to-government relationship between the United States and Indian tribes. This arises when tribal interests are affected by the actions of governmental agencies and departments. In this case, it is undisputed that the project lies within the Pechanga Tribe's traditional territory. Therefore, in order to comply with CEQA and other applicable Federal and California law, it is imperative that the EMWD consult with the Tribe in order to guarantee an adequate basis of knowledge for an appropriate evaluation of the Project effects, as well as generating adequate mitigation measures.

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[1] *See Executive Memorandum of April 29, 1994 on Government-to-Government Relations with Native American Tribal Governments and Executive Order of November 6, 2000 on Consultation and Coordination with Indian Tribal Governments.*

[2] *See California Public Resource Code §5097.9 et seq.; California Government Code §§65351,65352,65352.3 and 65352.4*

Response:

It is obvious that EMWD has consulted with the Tribe during project development. As stated above, the Tribe is on the distribution list to receive all public notices and environmental review documents associated with this project.

In the event that a General Plan, General Plan Amendment, Specific Plan or Specific Plan Amendment will be processed on this Project, the Lead Agency is required to consult with the Pechanga Tribe pursuant to a State law entitled Traditional Cultural Places (also known as SB 18; Cal. Govt. C. §65532.3).The purpose of consultation is to identify any Native American sacred places and any geographical areas which could potentially yield sacred places, identify proper means of treatment and management or such places, and to ensure the protection and preservation of such places through agreed upon mitigation (Cal. Govt. C. 65352.3, SB 18, Chapter 905, Section 1(4)(b)(3)).

Consultation must be government-to-government, meaning directly between the Tribe and the Lead Agency, seeking agreement where feasible (Cal. Govt. C. §65352.4, SB 18, Chapter 905, Section 1(4)(b)(3)). Lastly, any information conveyed to the Lead Agency concerning Native American sacred places shall be confidential in terms of the specific identity, location, character and use of these places and associated features and objects. This information is not subject to public disclosure pursuant the California Public Records Act (Ca. Govt. C. 6254(c)).

Response:

The Lead Agency for this Project, EMWD is a municipal water district and is not the land use planning agency for the Project area. In addition, all Project facilities will be within public street rights-of-way which are not subject to land use or zoning ordinances. Therefore, none of the above mentioned land use decisions are associated with this Project.

The Pechanga Tribe asserts that the Project area is part of Luiseño, and therefore the Tribe's, aboriginal territory as evidenced by the existence of Luiseño place names, tóota yixélval (rock art, pictographs, petroglyphs), and an extensive Luiseño artifact record in the vicinity of the five subareas of the Project. These culturally sensitive areas are affiliated with the Pechanga Band of Luiseño Indians because of the Tribe's cultural ties to these areas as well as extensive history in these areas.

The Pechanga Tribe's knowledge of our ancestral boundaries is based on reliable information passed down to us from our elders; published academic works in the areas of anthropology, history and ethno-history; and through recorded ethnographic and linguistic accounts. Many anthropologists and historians include the five sub-areas in their descriptions (Bean 1974; Sparkman 1908; Kroeber 1925; Oxendine 1983; White 1963; Harvey 1974; Smith and Freers 1994), and such territory descriptions correspond almost identically with that communicated to the Pechanga people by our elders. While historic accounts and anthropological and linguistic theories are important in

determining traditional Luiseño territory, the most critical sources of information used to define our traditional territories are our songs, creation accounts, and oral traditions.

Luiseño history originates with the creation of all things at 'éxva Teméeku, the present day City of Temecula, and dispersing out to all corners of creation (what is today known as Luiseño territory). It was at Temecula that the Luiseño deity Wuyóot lived and taught the people, and here that he became sick, finally expiring at Lake Elsinore. Many of our songs relate the tale of the people taking the dying Wuyóot to the many hot springs at Elsinore, where he died (DuBois 1908). He was cremated at 'éxva Teméeku. It is the Luiseño creation account that connects Elsinore to Temecula, and thus to the Temecula people who were evicted and moved to the Pechanga Reservation, and now known as the Pechanga Band of Luiseño Mission Indians (the Pechanga Tribe). From Temecula, the people spread out, establishing villages and marking their territories. The first people also became the mountains, plants, animals and heavenly bodies.

Many traditions and stories are passed from generation to generation by songs. One of the Luiseño songs recounts the travels of the people to Elsinore after a great flood (DuBois 1908). From here, they again spread out to the north, south, east and west. Three songs, called Moníivol, are songs of the places and landmarks that were destinations of the Luiseño ancestors, several of which are located near the Project area. They describe the exact route of the Temecula (Pechanga) people and the landmarks made by each to claim title to places in their migrations (DuBois 1908:110). In addition, Pechanga elders state that the Temecula/Pechanga people had usage/gathering rights to an area extending from Rawson Canyon on the east, over to Lake Mathews on the northwest, down Temescal Canyon to Temecula, eastward to Aguanga, and then along the crest of the Cahuilla range back to Rawson Canyon. The Project area is located within the south central area of this culturally affiliated territory. The Native American Heritage Commission (NAHC) Most Likely Descendent (MLD) files substantiate this habitation and migration record from oral tradition. These examples illustrate a direct correlation between the oral tradition and the physical place, proving the importance of songs and stories as a valid source of information outside of the published anthropological data.

Tóota yixélval (rock art) is also an important element in the determination of Luiseño territorial boundaries. Tóota yixélval can consist of petroglyphs (incised) elements, or pictographs (painted) elements. The science of archaeology tells us that places can be described through these elements. Riverside and Northern San Diego Counties are home to red-pigmented pictograph panels. Archaeologists have adopted the name for these pictograph-versions, as defined by Ken Hedges of the Museum of Man, as the San Luis Rey style. The San Luis Rey style incorporates elements which include chevrons, zig-zags, dot patterns, sunbursts, handprints, net/chain, anthropomorphic (human-like) and zoomorphic (animal-like) designs. Tribal historians and photographs inform us that some design elements are reminiscent of Luiseño ground paintings. A few of these design elements, particularly the flower motifs, the net/chain and zig-zags, were sometimes depicted in Luiseño basket designs and can be observed in remaining baskets and textiles today.

An additional type of tóota yixélval, identified by archaeologists also as rock art or petroglyphs, are cupules. Throughout Luiseño territory, there are certain types of large boulders, taking the shape of mushrooms or waves, which contain numerous small pecked and ground indentations, or cupules. Additionally, according to historian Constance DuBois:

> *When the people scattered from Ekvo Temeko, Temecula, they were very powerful. When they got to a place, they would sing a song to make water come there, and would call that place theirs; or they would scoop out a hollow in a rock with their hands to have that for their mark as a claim upon the land. The different parties of people had their own marks. For instance, Albañas's ancestors had theirs, and Lucario's people had theirs, and their own songs of Munival to tell how they traveled from Temecula, of the spots where they stopped and about the different places they claimed (1908:158).*

Our songs and stories, as well as academic works and recorded archeological/cultural sites, demonstrate that the Luiseño people who occupied the Project area are ancestors of the present-day Pechanga Band of Luiseño Indians, and as such, Pechanga is the appropriate culturally affiliated Tribe for projects that impact this geographic area.

The Tribe has a long history of working with EMWD and being the Lead Tribe on Projects within its jurisdiction. We have additional information regarding specific place names and and sensitive cultural areas that the sub-areas of the project may impact which are not included in this letter to protect their confidentiality. We welcome the opportunity to meet with EMWD to further explain and provide documentation concerning our specific cultural affiliation to and knowledge of these lands and the Project area.

Response:

The information on the Tribe's history is appreciated. No response is required to this informational material. EMWD and/or its consultants would be pleased to receive additional documentation on cultural resources in the Project area from the Tribe at any time.

The proposed Project is located in a highly sensitive regional of Luiseño territory and the Tribe believes that the possibility for recovering cultural resources during ground-disturbing activities is high. The Tribe has over thirty-five (35) years of experience in working with various types of construction projects throughout its territory. The combination of this knowledge and experience, along with the knowledge of the culturally-sensitive areas and oral tradition, is what the Tribe relies on to make generally accurate predictions regarding the likelihood of subsurface resources in a particular location.

To date, the Tribe has not received any environmental document for review on the Project. The Tribe requests to be involved and participate with EMWD in assuring that an adequate environmental assessment is completed for the entire Project, including analysis of off-site impacts and in

developing all monitoring and mitigation plans and measures for the duration of the Project. Because of the sensitivity of the area, we request a thorough archeology survey be conducted for all sub-areas of the Project by a Riverside County qualified archeologist. It is further the position of the Pechanga Tribe that Pechanga tribal monitors be required to be present during all cultural resource surveys, and archeological and ground-disturbing activities conducted in connection with the Project, including any additional archeological excavations performed. The Tribe also requests that all analysis of impacts to cultural resources for this Project area, must necessarily include all cultural resources in the vicinity, even if such complexes exist adjacent to, or nearby each sub-area of the Project.

Response:

The cultural resources studies for this Project did not find any cultural resources that might be impacted by implementation of the Project. As previously stated, all Project facilities are within public street rights-of-way, the majority of which are paved. Therefore, the possibility of finding any cultural resources in such a setting is very low.

Chapter 7 in the EA/DEIR as well as the Mitigation Monitoring and Reporting Program contains adequate mitigation measures for inadvertent discoveries.

Given the sensitivity of the area, inadvertent discoveries are foreseeable impacts and thus need to be appropriately mitigated for within the confines of the Project. It is imperative that adequate cultural resources assessment be performed in conjunction with the Project approval and environmental review process. The identification of surface resources during an archaeological survey should not be the sole determining factor in deciding whether mitigation measures for inadvertent discoveries are required. The cultural significance of the area, provided in consultation with the Pechanga Tribe, should play a large part in determining whether specifications concerning unanticipated discoveries should be included.

Response:

Chapter 7 in the EA/DEIR as well as the Mitigation Monitoring and Reporting Program contains adequate mitigation measures for inadvertent discoveries.

The proposed Project is on land that is within the traditional territory of the Pechanga Band of Luiseño Indians. The Pechanga Band is not opposed to this Project. The Tribe's primary concerns stem from the Project's proposed impacts on Native American cultural resources. The Tribe is concerned about both the protection of unique and irreplaceable cultural resources, such as Luiseño village sites, sacred sites and archaeological items which would be displaced by ground disturbing work on the Project, and on the proper and lawful treatment of cultural items, Native American human remains and sacred items likely to be discovered in the course of the work.

Response:

Chapter 7 in the EA/DEIR as well as the Mitigation Monitoring and Reporting Program contains adequate mitigation measures for the above concerns.

The CEQA Guidelines state that lead agencies should make provisions for inadvertent discoveries of cultural resources (CEQA Guidelines §15064.5). As such, it is the position of the Pechanga Tribe that an agreement specifying appropriate treatment of inadvertent discoveries of cultural resources be executed between EMWD and the Pechanga Tribe.

Response:

EMWD believes that its mitigation measures regarding inadvertent discoveries of cultural resources are adequate to protect such discoveries and an agreement with the Pechanga Tribe is not warranted. It must be restated, all project facilities are within public street rights-of-way that have previously been disturbed during construction of the streets as well as the installation of other utilities. No cultural resources have been found during any of this construction.

The Tribe believes that adequate cultural resources assessments and management must always include a component which addresses inadvertent discoveries. Every major State and Federal law dealing with cultural resources includes provisions addressing inadvertent discoveries (See e.g.: CEQA (Cal. Pub. Resources Code §21083.2(i); 14 CCR §1506a.5(f)); Section 106 (36 CFR §800.13); NAGPRA (43 CFR §10.4). Moreover, most state and federal agencies have guidelines or provisions for addressing inadvertent discoveries (See e.g.: FHWA, Section 4(f) Regulations - 771.135(g); CALTRANS, Standard Environmental Reference - 5- 10.2 and 5-10.3). Because of the extensive presence of the Tribe's ancestors within the Project area, it is very likely that evidence of habitation and use still exists. Such cultural resources and artifacts are significant to the Tribe as they are reminders of their ancestors. Moreover, the Tribe has a cultural responsibility to protect and assure that all cultural sites of its ancestors are appropriately treated in a respectful manner. Therefore, as noted previously, it is crucial to adequately address the potential for inadvertent discoveries.

Response:

Chapter 7 in the EA/DEIR as well as the Mitigation Monitoring and Reporting Program contains adequate mitigation measures for inadvertent discoveries.

Further, the Pechanga Tribe believes that if human remains are discovered, State law would apply and the mitigation measures for the permit must account for this. According to the California Public Resources Code, § 5097.98, if Native American human remains are discovered, the Native American Heritage Commission must name a "most likely descendant," who shall be consulted as to the appropriate disposition of the remains. Given the Project's location in Pechanga territory, the Pechanga Tribe intends to assert its right pursuant to California law with regard to any remains or items discovered in the course of this Project.

Response:

Chapter 7 in the EA/DEIR as well as the Mitigation Monitoring and Reporting Program contains adequate mitigation measures for inadvertent discoveries of human remains.

The Pechanga Tribe will itself be engaging in further assessment of the Project area, in consultation with tribal elders, to identify more specific information about this culturally sensitive area. The Tribe understands that an Initial Study and an Environmental Impact Report still must be prepared for this Project. The Tribe requests that EMWD, project Consultant Keith Dunbar and the Project Archeologist work directly with the Tribe to thoroughly evaluate and assess potential impacts to the Project Area, including any proposed off-site impacts. Moreover, the Tribe possess necessary information about the archeological and cultural sensitivity that an archeological survey alone will not reveal, and should be consulted with at the earliest possible stage of the environmental review to assist in identifying and mitigating the cultural resources impacts for this Project. The Tribe also requests to be included in any site visits and surveys to assist the Project Archeologist in assessing impacts to cultural resources in the Project area.

Response:

Once the Pechanga Tribe has completed its further assessment of the Project area, in consultation with tribal elders, EMWD and its consultant would be pleased to receive more specific information from the Tribe. No additional site surveys are scheduled at this time.

Once that process is complete, the Tribe may submit additional suggested mitigation to specifically address impacts to any sites or resources found during the archeological site assessments. For the present time, the Tribe asks that, at a minimum, EMWD include the following mitigation measures in its environmental assessment documents:

MM 1 *Prior to beginning Project construction, EMWD shall retain a Riverside County qualified archaeological monitor to monitor all ground-disturbing activities in an effort to identify any unknown archaeological resources. Any newly discovered cultural resource deposits shall be subject to a cultural resources evaluation.*

MM 2 *At least 30 days prior to beginning project construction the EMWD shall contact the Pechanga Tribe to notify the Tribe of grading, excavation and the monitoring program, and to coordinate with the Tribe to develop a Cultural Resources Treatment and Monitoring Agreement. The Agreement shall address the treatment of known cultural resources, the designation, responsibilities, and participation of Native American Tribal monitors during grading, excavation and ground disturbing activities; project grading and development scheduling; terms of compensation; and treatment and final disposition of any cultural resources, sacred sites, and human remains discovered on the site.*

MM 3 *Prior to beginning project construction, the Project Archaeologist shall file a pre-grading report with the EMWD (if required) to document the proposed methodology for grading activity*

observation. Said methodology shall include the requirement for a qualified archaeological monitor to be present and to have the authority to stop and redirect grading activities. In accordance with the agreement required in MM 2, the archaeological monitor's authority to stop and redirect grading will be exercised in consultation with the appropriate Tribe in order to evaluate the significance of any archaeological resources discovered on the property. Tribal monitors shall be allowed to monitor all grading, excavation and groundbreaking activities, and shall also have the authority to stop and redirect grading activities in consultation with the Project archaeologist.

MM 4 *If human remains are encountered, California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the Riverside County Coroner has made the necessary findings as to origin. Further, pursuant to California Public Resources Code Section 5097.98(b), remains shall be left in place and free from disturbance until a final decision as to the treatment and disposition has been made. If the Riverside County Coroner determines the remains to be Native American, the Native American Heritage Commission shall be notified within 24 hours. The NAHC must identify a Most Likely Descendant(s) under Public Resources Code §5097.98 within 48 hours of receiving notification of the discovery. The most likely descendant(s) shall then make recommendations, and engage in occultation concerning the treatment of the remains as provided in Public Resources Code §5097.98 and the treatment agreement described in MM 2..*

MM 5 *The landowner shall relinquish ownership of all cultural resources, including sacred items, burial goods and all archaeological artifacts that are found on the project area to the Pechanga Tribe for proper treatment and disposition.*

MM 6 *All sacred sites, should they be encountered within the Project area, shall be avoided and preserved as the preferred mitigation, if feasible.*

MM 7 *If inadvertent discoveries of subsurface archeological resources are discovered during grading, EMWD, the Project Archeologist, and the Tribe shall assess the significance of such resources and shall meet and confer regarding the mitigation for such resources. EMWD shall make the determination of significance or the mitigation for such resources, based on the provisions of the California Environmental Quality Act with respect to archeological resources and shall take into account the religious beliefs, customs, and practices of the Pechanga Tribe.*

Response:

EMWD sincerely believes that the mitigation measures included in Chapter 7 of this EA/DEIR and the Mitigation Monitoring and Reporting Program are more than adequate to protect the cultural resources in the Project area.

The Pechanga Tribe looks forward to working together with EMWD and K.S. Dunbar & Associates, Inc., in protecting the invaluable Pechanga cultural resources found in the Project area. Please contact me at 951-308-0205 x 8106 once you have had a chance to review these comments so that

we might address any outstanding issues concerning the Project as well as to schedule SB18 consultation.

Response:

EMWD and K.S. Dunbar & Associates, Inc., look forward to continuing its coordination efforts with the Pechanga Tribe regarding this Project. As previously stated, SB 18 is not applicable to this Project.

The Metropolitan Water District of Southern California

On May 8, 2010 a letter dated April 22, 2010 (mailed on May 6) was received from Delaine W. Shane, Manager, Environmental Planning Team. Although EMWD does not have a legal obligation to respond to late comments, in the spirit of cooperation with The Metropolitan Water District of Southern California's Environmental Planning Team, its responses to those comments follow (the actual comment letter is included in Appendix B of this EA/DEIR):

Metropolitan owns and operates several large pipelines that cross the alignments of the proposed recycled water pipelines shown in the project maps included with the NOP, specifically within the San Jacinto distribution area. Any new recycled water pipeline (including those pipelines converted from previous potable uses) in these areas must ensure protection of Metropolitan facilities (i.e., water quality, pipeline integrity). We recommend the Draft EIR identify these pipeline crossings and the necessary separation and containment criteria to ensure protection of our significant water supply pipelines located within the project area. These crossings would also need to ensure compliance with the applicable Title 22 Waterworks Standards and California Department of Public Health guidance on separation of water mains and non-potable pipelines.

Response:

EMWD is aware of the fact that its proposed 12-inch diameter recycled water line in Cottonwood Avenue will cross over MWD's San Diego Pipeline Nos. 1 and 2 just east of Sanderson Avenue as well as the San Diego Aqueduct just west of Warren Road. All proposed pipelines are being designed to comply with State Department of Health criteria. The designs of the crossings of MWD facilities are also being coordinated with Metropolitan.

In order to avoid potential conflicts with Metropolitan's facilities and rights-of-way, we require that any design plans for any activity in the area of Metropolitan's pipeline or facilities be submitted for our review and written approval. Approval of the project should be contingent on Metropolitan's approval of design plans for the proposed alignment that could impact its facilities.

Response:

As stated above, the design of project facilities that could impact Metropolitan's facilities is being coordinated with Metropolitan.

The applicant may obtain detailed prints of drawings of Metropolitan's pipelines and rights-of-way by calling Metropolitan's Substructures Information Line at (213) 217-6564. To assist the applicant in preparing plans that are compatible with Metropolitan's facilities and easements, we have enclosed a copy of the "Guidelines for Developments in the Area of Facilities, Fee Properties, and/or Easements of The Metropolitan Water District of Southern California". Please note that all submitted designs or plans must clearly identify Metropolitan's facilities and rights-of-way.

Response:

EMWD is in contact with Metropolitan's Substructures engineers concerning the design of the Project.

EA/DEIR Circulation

On June 29, 2010 EMWD mailed copies of the Environmental Assessment/Draft Environmental Impact Report to those agencies, entities and individuals in the following list:

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24 Acronyms and Abbreviations

AAM	annual arithmetic mean
ADOE	Archaeological Determinations of Eligibility
AGM	annual geometric mean
AQMP	Air Quality Management Plan
ARB	Air Resources Board
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CalEPPC	California Exotic Plant Pest Council
Caltrans	California Department of Transportation
CCAA	California Clean Air Act
CCR	California Code of Regulations
CDFA	California Department of Food and Agriculture
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CH_4	methane
CNEL	community noise equivalent level
CO	carbon monoxide
CO_2	carbon dioxide
CRWQCB, SAR	California Regional Water Quality Control Board, Santa Ana Region

dB(A)	decibels on the A-scale
DFG	California Department of Fish and Game
DEIR	Draft Environmental Impact Report
DTSC	Department of Toxic Substances Control
EIR	Environmental Impact Report
EMWD	Eastern Municipal Water District
EPA	U.S. Environmental Protection Agency
EPDC	expected peak day concentration
ESA	Endangered Species Act
g	acceleration due to gravity
GHG	greenhouse gases
GIS	Geographic Information System
gpm	gallons per minute
GWP	global warming potential
HDP	Historic Property Directory
KSD&A	K.S. Dunbar & Associates, Inc.
Ldn	day-night average sound level
Leq	noise equivalent
LUSTIS	Leaking Underground Storage Tank Information System
mg	million gallons
mgd	million gallons per day
MMRP	Mitigation Monitoring and Reporting Program
MSHCP	Western Riverside County Multiple Species Habitat Conservation Plan
MBTA	Migratory Bird Treaty Act
MT	metric tons

MWD	The Metropolitan Water District of Southern California
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NDDB	Natural Diversity Data Base
NO	nitrogen oxide
NO_2	nitrogen dioxide
NO_x	oxides of nitrogen
NPL	National Priorities List
O_3	ozone
OES	Office of Emergency Services
OHP	Office of Historic Preservation
Pb	lead
Pga	peak ground acceleration
PM	particulate matter
PM_{10}	particulate matter (less than 10 microns in diameter)
$PM_{2.5}$	particulate matter (less than 2.5 microns in diameter)
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
RCFCWCD	Riverside County Flood Control and Water Conservation District
ROG	reactive organic gases also called VOC (volatile organic compounds)
RWRF	Regional Water Reclamation Facility
Sa	spectral acceleration
SAAQS	State Ambient Air Quality Standards
SCAB	South Coast Air Basin
SCADA	Supervisory Control and Data Acquisition

SCAQMD	South Coast Air Quality Management District
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_x	oxides of sulfur
SJVRWRF	San Jacinto Valley Regional Water Reclamation Facility
State Water Board	State Water Resources Control Board
SWIS	Solid Waste Information System
TOG	total organic gases
UCR	University of California, Riverside
USC	United States Code
USF&WS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Service
$\mu g/m^3$	micrograms per cubic meter

Appendix A

NOP and Attachment

Erica D. Dunbar, President
Keith S. Dunbar, P.E., BCEE, F. ASCE
Chief Executive Officer

Celebrating Over 30 Years of Service
to the
Water and Wastewater Industry

February 26, 2010

Interested Entities

Notice of Preparation of an Environmental Assessment/
Draft Environmental Impact Report
Recycled Water Distribution Pipeline Expansion Project

Dear Gentlepersons:

EMWD will be the Lead Agency and will prepare an Environmental Assessment/Draft Environmental Impact Report (EA/EIR) for the project identified above. EMWD may seek financial assistance from the U.S. Bureau of Reclamation; therefore, it is necessary to comply with the National Environmental Policy Act (NEPA) as well as the California Environmental Quality Act (CEQA).

We need to know the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EA/EIR prepared by EMWD when considering your permit or other approval for the project.

The project description, location and the potential environmental effects are contained in the attached materials. A copy of the Initial Study (☐ is ☒ is not) attached.

Due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice.

Please send your response to Keith S. Dunbar, P.E., BCEE, F. ASCE at the letterhead address. We will need the name of a contact person in your agency.

Sincerely,

K.S. Dunbar

Keith S. Dunbar, P.E., BCEE, F. ASCE

Enclosure

pc: Karen Hackett
Environmental Compliance Analyst

K.S. DUNBAR & ASSOCIATES, INC. ENVIRONMENTAL ENGINEERING
3035 Calle Frontera San Clemente, CA 92673-3012 949-366-2089 FAX 949-366-5315 Email: ksdpe@cox.net

Attachment to Notice of Preparation of an Environmental Assessment/Draft Environmental Impact Report

Recycled Water Distribution Pipeline Expansion Project

Prepared for:

Eastern Municipal Water District
Post Office Box 8300
Perris, California 92572-8300

U.S. Bureau of Reclamation
27708 Jefferson Avenue, Suite 202
Temecula, California 92590-2641

Prepared by:

K.S. Dunbar & Associates, Inc.
Environmental Engineering
3035 Calle Frontera
San Clemente, California 92673-3012
(949) 366-2089
FAX: (949) 366-5315
Email: ksdpe@cox.net

February 2010

Project Background and Description

Project Background

In 2003, Eastern Municipal Water District (EMWD) adopted its *Mandatory Use Policy for Recycled Water* and began working with developers to design and construct facilities and irrigation systems for recycled water use. In many cases, these facilities are presently being supplied with potable water in anticipation of future recycled water availability. These developer projects are considered "conversions" and are located throughout EMWD's service area. These conversion projects have been strategically located in geographic vicinities which are both close to existing large potable water landscape users (retrofits) and planned future development.

Subsequently in June 2009, EMWD completed its *Recycled Water Strategic Plan.* Two of the stated objectives in this plan are: 1) fully utilize 100% of recycled water within EMWD's service area and 2) maximize potable water offsets. In order to meet these objectives, EMWD's *Recycled Water Strategic Plan* has allocated current and future recycled water supplies to serve conversions, retrofits and future development. Facility improvements (secondary distribution piping) must be completed in order to deliver recycled water to both conversions and retrofits. In 2009, EMWD began a retrofit planning study through a grant from the California State Water Resources Control Board (State Water Board). This study will further evaluate retrofit opportunities throughout EMWD and is anticipated to be completed by the first quarter of 2010. EMWD is also considering applying for funding from the following sources:

- Local Resources Program (LRP) funding through The Metropolitan Water District of Southern California (MWD).
- State Revolving Fund Program (SRF) funding through the State Water Resources Control Board.
- Title XVI (Water Recycling and Reuse Program) funding through the U.S. Bureau of Reclamation.

Pursuant to the *Mandatory Use Policy for Recycled Water* and the *Recycled Water Strategic Plan,* EMWD is actively pursuing landscape demand for maximizing the beneficial use of recycled water to offset potable water demand. In conjunction with the HR30/ARRA[1] system stabilization projects, the Recycled Water Distribution Expansion Pipeline Project (Project) is intended to design and construct secondary distribution piping to serve existing landscape demand while supporting future development. The existing demand is both retrofits and conversions and will benefit EMWD by providing an immediate

[1] H.R. 30 means House Resolution No. 30, which amended the Reclamation Wastewater and Groundwater Study and Facility Act to authorize the Secretary of the Interior to participate in the Eastern Municipal Water District Recycled Water Pressurization and Expansion Project. ARRA means the American Recovery and Reinvestment Act.

reduction of approximately 2,000 acre-feet annually (afa) of potable water demand while helping to support an additional 5,300 afa of new development landscape demand.

Project Description

The Recycled Water Distribution Expansion Pipeline Project (Project) is broken up into five "sub-projects" based on geographic location. These are: Diamond Valley, Menifee, French Valley, Moreno Valley/Perris North and San Jacinto. Combined these projects include approximately 89,405 lineal feet (16.9 miles) of pipeline varying in size from 8-inch diameter up to 24-inch diameter. The breakdown by diameter is as follows: 5,745 lineal feet of 8-inch diameter pipeline, 67,258 lineal feet of 12-inch diameter pipeline, 9,752 lineal feet of 18-inch diameter pipeline, and 6,650 lineal feet of up to 24-inch diameter pipeline. A summary of pipeline identification numbers, location, size and length by sub-project are provided in Table 1 and shown on Figures 1 through 6.

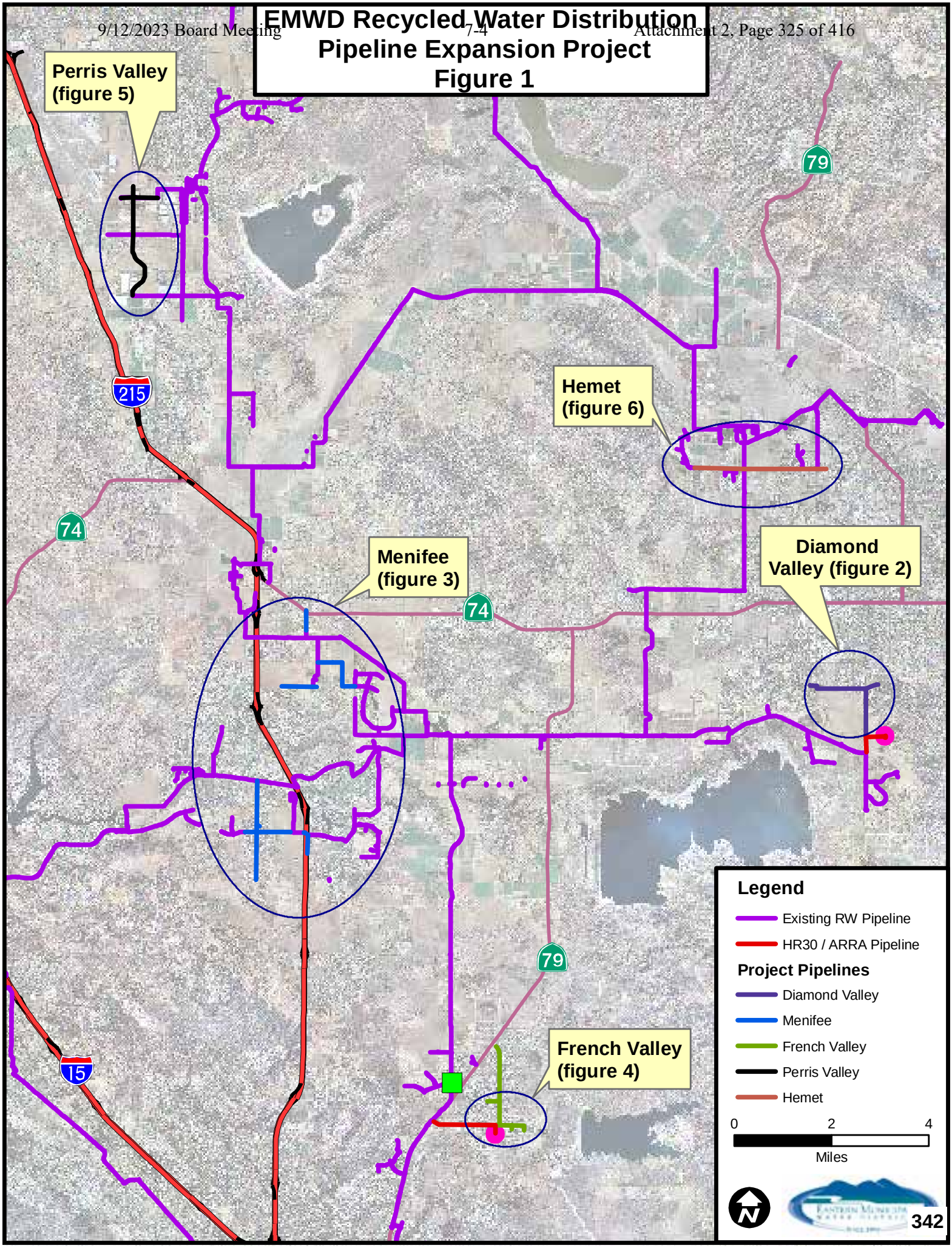
Table 1
Recycled Water Distribution Summary

Diamond Valley Recycled Water Distribution Summary					
Pipeline ID (Fig. 2)	**Street Alignment**	**From Street**	**To Street**	**Size (inches)**	**Length (feet)**
DV-1	State Street North	Simpson	Chambers	up to 24	5,250
DV-2	West Chambers	State Street	Lyon Avenue	12	5,300
DV-3	East Chambers	State Street	Buena Vista Street	Up to 24	1,400
DV-4	Lyon Ave./Pepper Tree	Chambers	Pepper Tree	8	1,100
				Subtotal	**13,050**
Menifee Recycled Water Distribution Summary					
Pipeline ID (Fig. 3)	**Street Alignment**	**From Street**	**To Street**	**Size (inches)**	**Length (feet)**
M-1	Antelope Road	La Piedra	320' N of Holland	8	2,040
M-2	Chambers Avenue	525' east of Aspel	Sherman	12	3,820
M-3	Rouse Road	San Jacinto Rd.	250' E of Palomar	12	1,645
M-4	Rouse, Junipero & McCall	250' east of Palomar	Menifee	12	5,025
M-5	Bradley north of La Piedra	La Piedra	N of Salt Creek Channel	18	5,570
M-6	Bradley south of La Piedra	La Piedra	100' N of Craig Ave	12	5,200
M-7	Jack & Bore I-215	Antelope Road	120' W I-215	--	500
M-8	La Piedra E of Bradley	Bradley Road	250' W of Haun Rd	18	3,682
M-9	La Piedra W of Bradley	Bradley Road	60' W of Pine Creek Dr	12	1,240
M-10	School Park Drive	Bradley Road	110' E of Lamdin Ln	8	290
M-11	Antelope Road	775' N of McLaughlin	N of Highway 74	12	2,140
				Subtotal	**31,152**
French Valley Recycled Water Distribution Summary					
Pipeline ID (Fig. 4)	**Street Alignment**	**From Street**	**To Street**	**Size (inches)**	**Length (feet)**
FV-1	Benton Road	475' W of Pourroy Road	Maddalena Road	12	3,100
FV-2	Pourroy Road	Benton Road	375' S of Hiway 79	12	8,660
FV-3	Maddalena Road	Benton Road	200' S of Fleurs Ln	8	550
FV-4	Thompson Road	Pourroy Road	300' E of Joltaire Way	8	1,340
FV-5	Cady Road	Benton Road	75' N of Beaulieu Road	8	425
				Subtotal	**14,075**

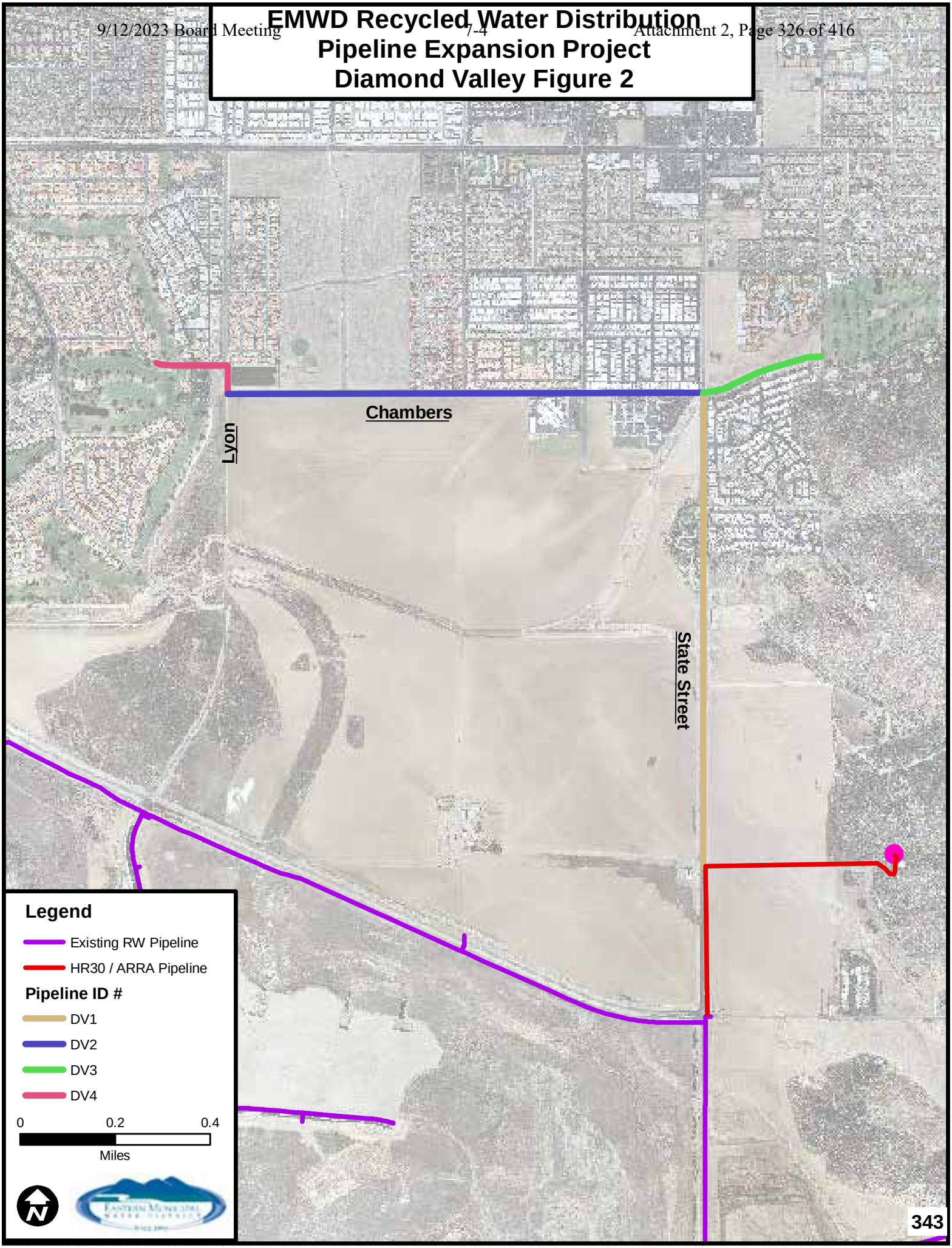
Moreno Valley/Perris North Recycled Water Distribution Summary					
Pipeline ID (Fig. 5)	**Street Alignment**	**From Street**	**To Street**	**Size (inches)**	**Length (feet)**
PN-1	Indian Avenue	Morgan Street	San Michele Road	12	12,820
PN-2	Nandina Avenue	Perris Boulevard	1,350' W of Indian Ave	12	3,958
				Subtotal	**16,778**
San Jacinto Recycled Water Distribution Summary					
Pipeline ID (Fig. 6)	**Street Alignment**	**From Street**	**To Street**	**Size (inches)**	**Length (feet)**
I ¢-1	Cottonwood Avenue	Warren Road	275' E of Pine Street	12	14,350
				Subtotal	**14,350**
				Total	**89,405**

Note: General pipeline alignment shall be on the north or east side of the street at 7' from existing or future face of curb.

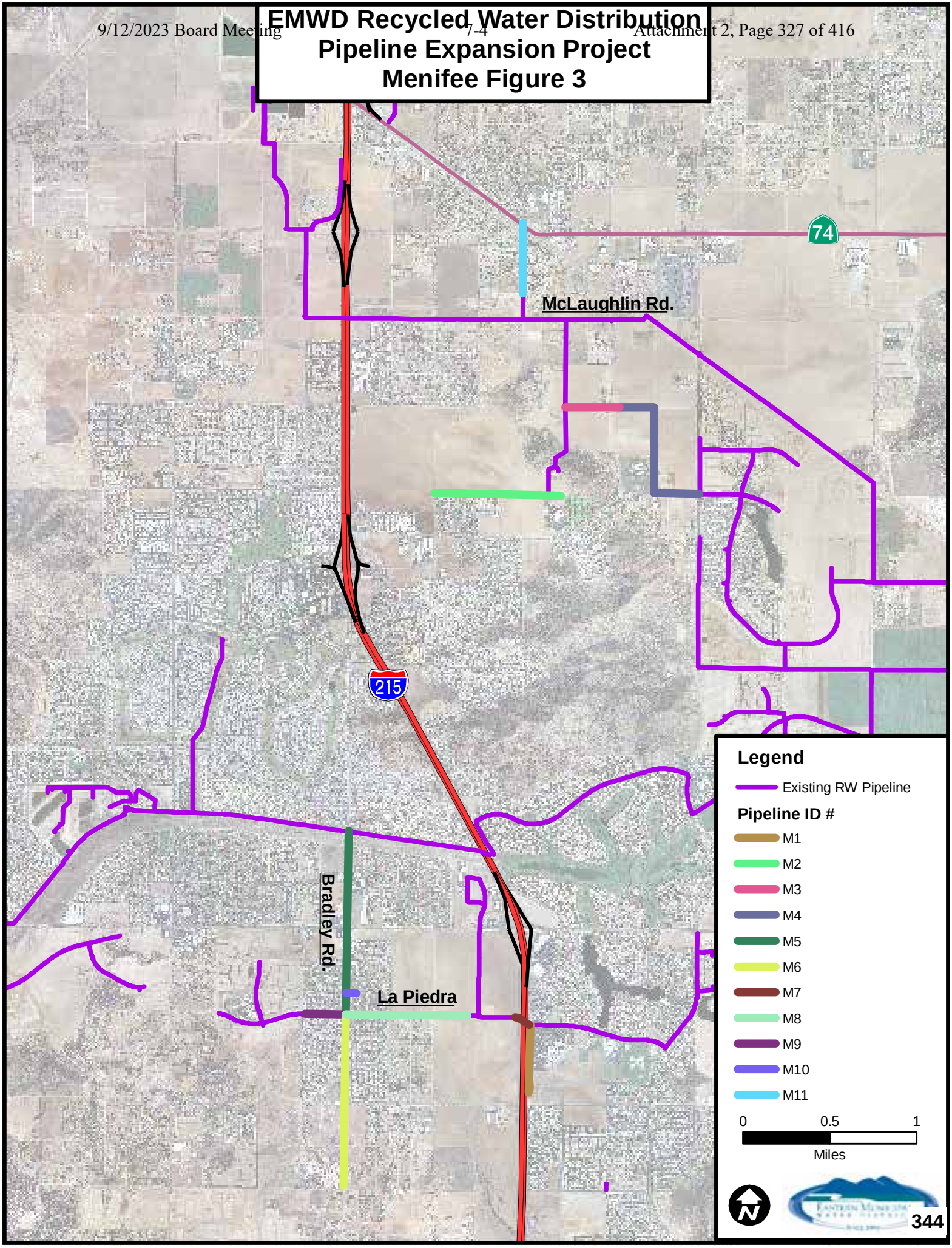
EMWD Recycled Water Distribution Pipeline Expansion Project Figure 1



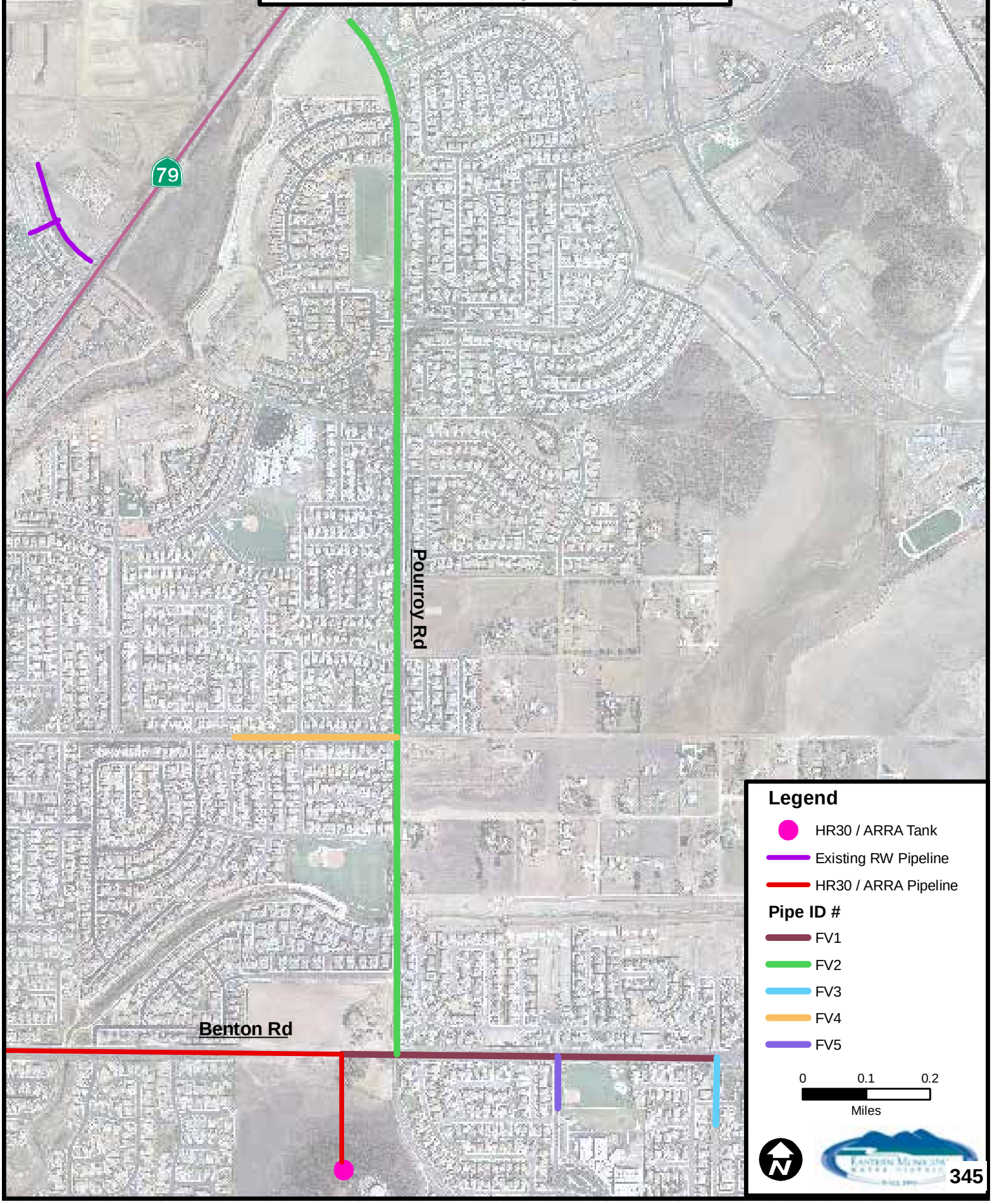
EMWD Recycled Water Distribution Pipeline Expansion Project Diamond Valley Figure 2



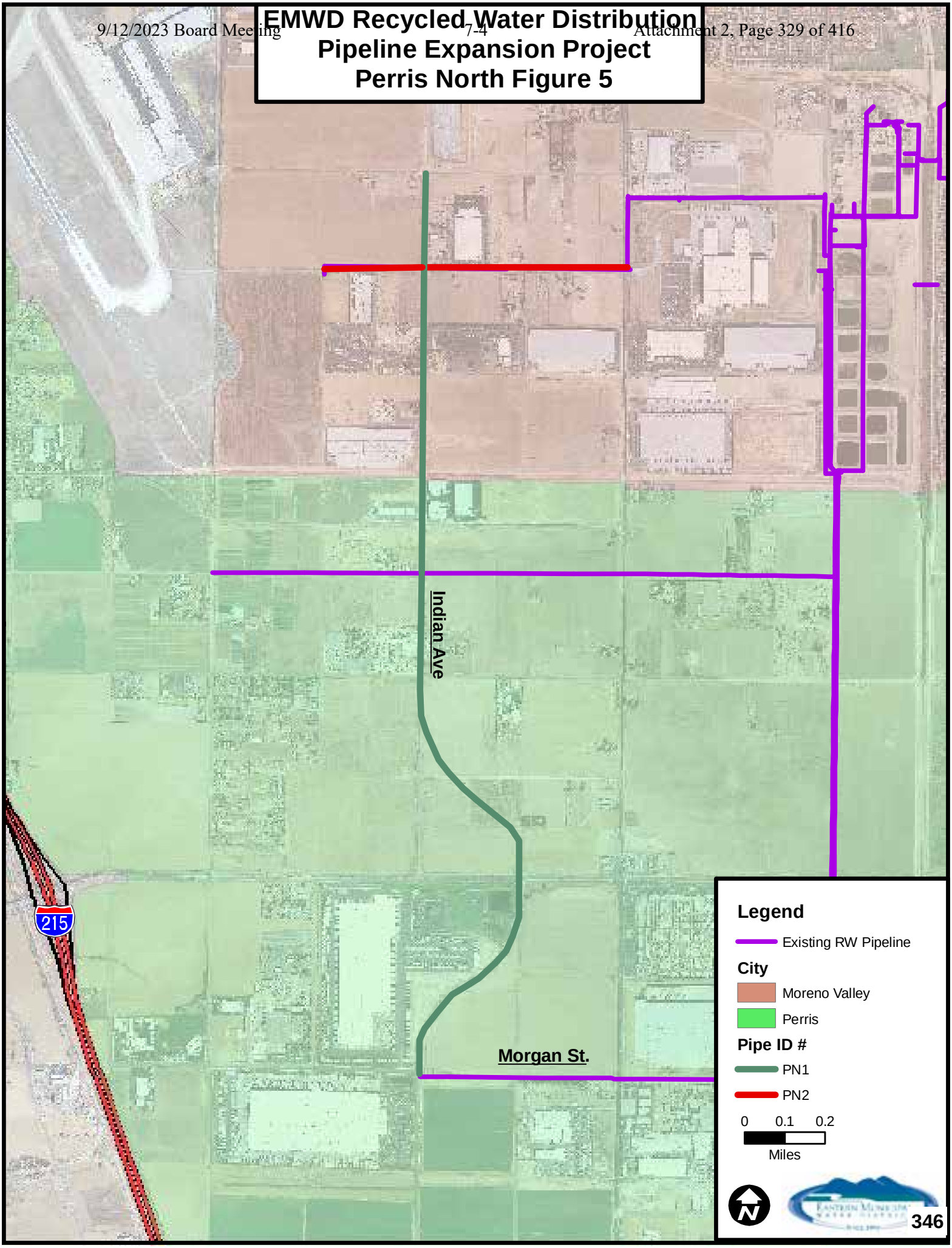
EMWD Recycled Water Distribution Pipeline Expansion Project Menifee Figure 3



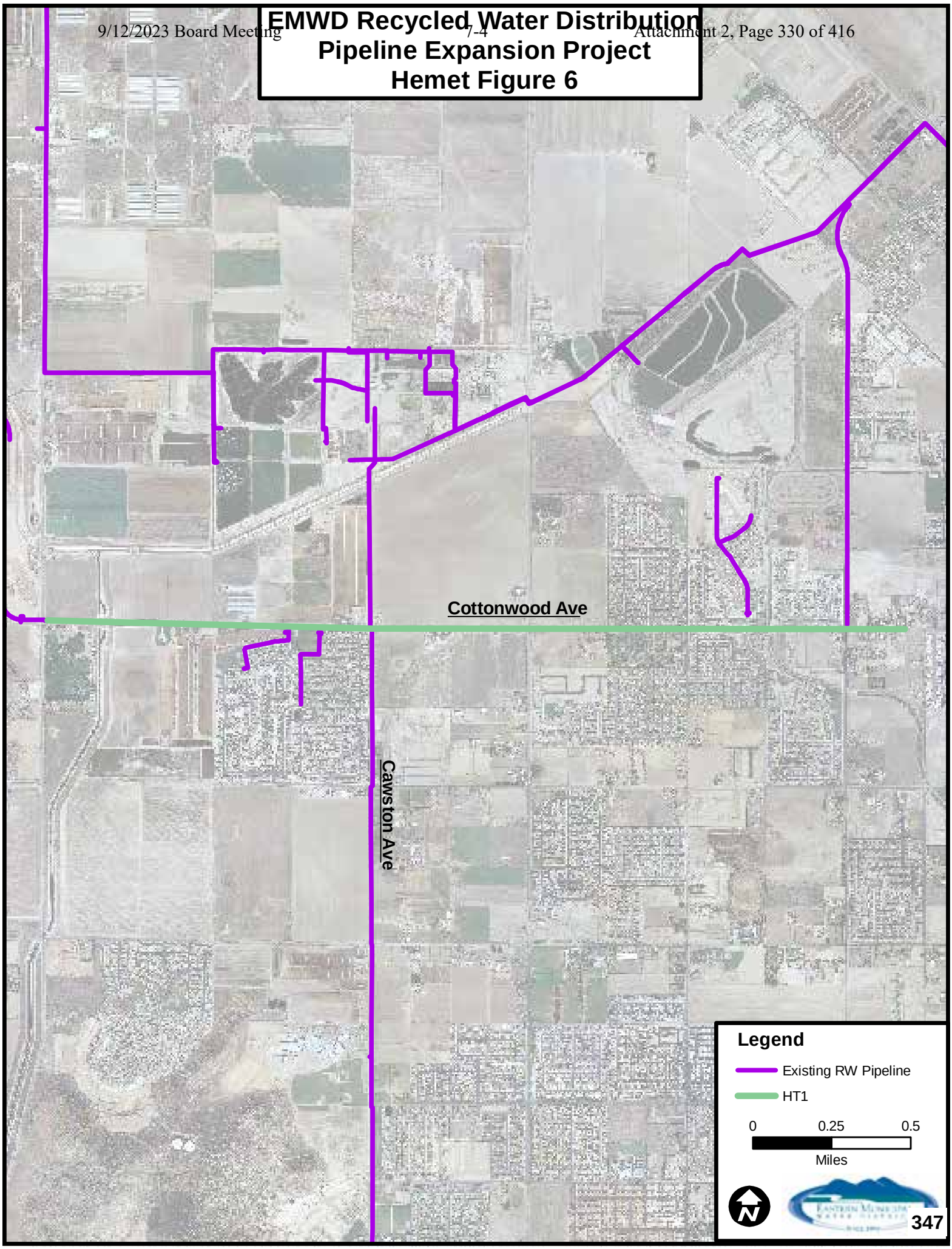
EMWD Recycled Water Distribution Pipeline Expansion Project French Valley Figure 4



EMWD Recycled Water Distribution Pipeline Expansion Project Perris North Figure 5



EMWD Recycled Water Distribution Pipeline Expansion Project Hemet Figure 6



Potential Environmental Impacts

Implementation of Eastern Municipal Water District's Recycled Water Distribution Project could result in the following environmental impacts:

- **Aesthetics**
  - Temporary aesthetic impacts due to heavy equipment and personnel in construction area.
- **Air Quality Impacts**
  - Temporary air quality impacts due to emissions from heavy construction equipment and fugitive dust.
- **Biological Impacts**
  - Temporary biological impacts due to construction activities.
- **Geology and Soils Impacts**
  - Construction activities would disturb approximately 25 acres of soil that would result in the potential for wind and water erosion.
- **Hazards and Hazardous Materials**
  - Construction would require the handling of potentially hazardous materials (e.g., fuels, lubricating fluids, solvents, etc.).
- **Hydrology and Water Quality Impacts**
  - During site grading and excavation, bare soil would be exposed to wind and water erosion. If precautions are not taken to contain sediments, construction activities could produce sediment laden storm runoff.
- **Noise Impacts**
  - There would be temporary noise impacts during the construction period.

- **Transportation/Traffic**
  - During construction of the pipelines, there could be times when traffic would be disrupted along the alignments due to lane closures.

Appendix B

Comments Received on NOP

STATE OF CALIFORNIA

GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH

STATE CLEARINGHOUSE AND PLANNING UNIT

ARNOLD SCHWARZENEGGER
GOVERNOR

CYNTHIA BRYANT
DIRECTOR

Notice of Preparation

March 1, 2010

To: Reviewing Agencies

Re: Recycled Water Distribution Pipeline Expansion Project
SCH# 2010031001

Attached for your review and comment is the Notice of Preparation (NOP) for the Recycled Water Distribution Pipeline Expansion Project draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

K.S. Dunbar
Eastern Municipal Water District
c/o 3035 Calle Frontera
San Clemente, CA 92673-3012

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Acting Director

Attachments
cc: Lead Agency

1400 10th Street P.O. Box 3044 Sacramento, California 95812-3044
(916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH# 2010031001
Project Title Recycled Water Distribution Pipeline Expansion Project
Lead Agency Eastern Municipal Water District

Type NOP Notice of Preparation

Description EMWD intends to expand its existing recycled water distribution system to serve existing landscape demand for areas presently utilizing potable water and future development of landscaped areas. The project is broken up into five sub-projects based on geographic location. These are: Diamond Valley, Menifee, French Valley, Perris North and San Jacinto. These projects include approximately 89,405 lineal feet (16.9 miles) of pipeline varying in size from 8-inch diameter up to 24-inch diameter.

Lead Agency Contact

Name K.S. Dunbar
Agency Eastern Municipal Water District
Phone 949-366-2089 **Fax**
email
Address c/o 3035 Calle Frontera
City San Clemente **State** CA **Zip** 92673-3012

Project Location

County Riverside
City
Region
Cross Streets
Lat / Long
Parcel No.
Township **Range** **Section** **Base**

Proximity to:

Highways Hwy 74, 79
Airports Hemet Ryan
Railways
Waterways San Jacinto River, Salt Creek
Schools several
Land Use

Project Issues Aesthetic/Visual; Air Quality; Biological Resources; Geologic/Seismic; Noise; Traffic/Circulation; Water Quality

Reviewing Agencies Resources Agency; Office of Historic Preservation; Department of Parks and Recreation; Department of Water Resources; Department of Fish and Game, Region 6; CA Department of Public Health; Native American Heritage Commission; California Highway Patrol; Caltrans, District 8; State Water Resources Control Board, Divison of Financial Assistance; State Water Resources Control Board, Division of Water Quality; Department of Toxic Substances Control

Date Received 03/01/2010 **Start of Review** 03/01/2010 **End of Review** 03/30/2010

Note: Blanks in data fields result from insufficient information provided by lead agency.

NOP Distribution List

County: RIVERSIDE

SCH# 2010031001

Resources Agency

- [x] Resources Agency
  Nadell Gayou
- [ ] Dept. of Boating & Waterways
  Mike Sotelo
- [ ] California Coastal Commission
  Elizabeth A. Fuchs
- [ ] Colorado River Board
  Gerald R. Zimmerman
- [ ] Dept. of Conservation
  Rebecca Salazar
- [ ] California Energy Commission
  Eric Knight
- [ ] Cal Fire
  Allen Robertson
- [x] Office of Historic Preservation
  Wayne Donaldson
- [x] Dept of Parks & Recreation
  Environmental Stewardship Section
- [ ] Central Valley Flood Protection Board
  James Herota
- [ ] S.F. Bay Conservation & Dev't. Comm.
  Steve McAdam
- [x] Dept. of Water Resources
  Resources Agency
  Nadell Gayou
- [ ] _____
  Conservancy

Fish and Game

- [ ] Depart. of Fish & Game
  Scott Flint
  Environmental Services Division
- [ ] Fish & Game Region 1
  Donald Koch
- [ ] Fish & Game Region 1E
  Laurie Harnsberger
- [ ] Fish & Game Region 2
  Jeff Drongesen
- [ ] Fish & Game Region 3
  Charles Armor
- [ ] Fish & Game Region 4
  Julie Vance
- [ ] Fish & Game Region 5
  Don Chadwick
  Habitat Conservation Program
- [x] Fish & Game Region 6
  Gabrina Gatchel
  Habitat Conservation Program
- [ ] Fish & Game Region 6 I/M
  Brad Henderson
  Inyo/Mono, Habitat Conservation Program
- [ ] Dept. of Fish & Game M
  George Isaac
  Marine Region

Other Departments

- [ ] Food & Agriculture
  Steve Shaffer
  Dept. of Food and Agriculture
- [ ] Depart. of General Services
  Public School Construction
- [ ] Dept. of General Services
  Anna Garbeff
  Environmental Services Section
- [x] Dept. of Public Health
  Bridgette Binning
  Dept. of Health/Drinking Water

Independent Commissions,Boards

- [ ] Delta Protection Commission
  Linda Flack
- [ ] Cal EMA (Emergency Management Agency)
  Dennis Castrillo
- [ ] Governor's Office of Planning & Research
  State Clearinghouse
- [x] Native American Heritage Comm.
  Debbie Treadway
- [ ] Public Utilities Commission
  Leo Wong
- [ ] Santa Monica Bay Restoration
  Guangyu Wang
- [ ] State Lands Commission
  Marina Brand
- [ ] Tahoe Regional Planning Agency (TRPA)
  Cherry Jacques

Business, Trans & Housing

- [ ] Caltrans - Division of Aeronautics
  Sandy Hesnard
- [ ] Caltrans - Planning
  Terri Pencovic
- [x] California Highway Patrol
  Scott Loetscher
  Office of Special Projects
- [ ] Housing & Community Development
  CEQA Coordinator
  Housing Policy Division

Dept. of Transportation

- [ ] Caltrans, District 1
  Rex Jackman
- [ ] Caltrans, District 2
  Marcelino Gonzalez
- [ ] Caltrans, District 3
  Bruce de Terra
- [ ] Caltrans, District 4
  Lisa Carboni
- [ ] Caltrans, District 5
  David Murray
- [ ] Caltrans, District 6
  Michael Navarro
- [ ] Caltrans, District 7
  Elmer Alvarez
- [x] Caltrans, District 8
  Dan Kopulsky
- [ ] Caltrans, District 9
  Gayle Rosander
- [ ] Caltrans, District 10
  Tom Dumas
- [ ] Caltrans, District 11
  Jacob Armstrong
- [ ] Caltrans, District 12
  Chris Herre

Cal EPA

Air Resources Board

- [ ] Airport Projects
  Jim Lerner
  - [ ] Transportation Projects
    Douglas Ito
  - [ ] Industrial Projects
    Mike Tollstrup
- [ ] California Department of Resources, Recycling & Recovery
  Sue O'Leary
- [x] State Water Resources Control Board
  Regional Programs Unit
  Division of Financial Assistance
- [x] State Water Resources Control Board
  Student Intern, 401 Water Quality Certification Unit
  Division of Water Quality
- [ ] State Water Resouces Control Board
  Steven Herrera
  Division of Water Rights
- [x] Dept. of Toxic Substances Control
  CEQA Tracking Center
- [ ] Department of Pesticide Regulation
  CEQA Coordinator

Regional Water Quality Control Board (RWQCB)

- [ ] RWQCB 1
  Cathleen Hudson
  North Coast Region (1)
- [ ] RWQCB 2
  Environmental Document Coordinator
  San Francisco Bay Region (2)
- [ ] RWQCB 3
  Central Coast Region (3)
- [ ] RWQCB 4
  Teresa Rodgers
  Los Angeles Region (4)
- [ ] RWQCB 5S
  Central Valley Region (5)
  - [ ] RWQCB 5F
    Central Valley Region (5)
    Fresno Branch Office
  - [ ] RWQCB 5R
    Central Valley Region (5)
    Redding Branch Office
- [ ] RWQCB 6
  Lahontan Region (6)
  - [ ] RWQCB 6V
    Lahontan Region (6)
    Victorville Branch Office
- [ ] RWQCB 7
  Colorado River Basin Region (7)
- [ ] RWQCB 8
  Santa Ana Region (8)
- [ ] RWQCB 9
  San Diego Region (9)
- [ ] Other _____

Last Updated on 01/04/2010

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 8
PLANNING
464 WEST 4th STREET, 6th Floor MS 725
SAN BERNARDINO, CA 92401-1400
PHONE (909) 383-4557
FAX (909) 383-5936
TTY (909) 383-6300

Flex your power!
Be energy efficient!

March 3, 2010

Mr. Keith S. Dunbar
K.S. Dunbar & Associates
3035 Calle Frontera
San Clemente, CA 92673

Notice of Preparation for the Recycled Water Distribution Pipeline Expansion Project Environmental Assessment/Draft Environmental Impact Report, RIV-215-PM 18.516

Dear Mr. Dunbar:

We have completed our review of the Notice of Preparation (NOP) for the Recycled Water Distribution Pipeline Expansion Project Environmental Assessment/Draft Environmental Impact Report (EA/DEIR). The proposed Project includes the expansion of pipelines within the Eastern Municipal Water District (EMWD) to accommodate the delivery of recycled water. The Project is broken up into five "sub-project'" areas based on geographic locations. These locations include: Diamond Valley, Menifee, French Valley, Moreno Valley/Perris North, and San Jacinto.

The Menifee sub-project area includes sites that directly abut and/or traverse Interstate 215 (I-215) and State Route 74 (SR-74). Pipeline ID# M1 is located on Antelope Road from La Piedra Road to Holland Road, parallel to the east portion of I-215; Pipeline ID# M7 traverses I-215, and Pipeline ID# 11 is located on Antelope Road from McLaughlin Road to the north of SR-74, and directly abuts SR-74. All comments herein are applicable to these locations.

The NOP indicates that construction activities may disrupt traffic due to lane closures along the pipeline alignments. If any construction activities result in major lane closures, which are expected to result in *significant traffic impacts*, and/or a Significant Traffic Impact, which is an individual traffic delay of 30 minutes or more above normal recurrent travel time on the existing facility, a Transportation Management Plan may be required.

Because the Menifee sub-project area will partake in construction activities within the State right-of-way (R/W) an Encroachment Permit will be required. The applicant's environmental documentation must include such work in their project description and indicate that an encroachment permit will be needed. As part of the Encroachment Permit process, the developer must provide appropriate environmental approval for potential environmental impacts to State Highway R/W. Construction within the State R/W shall be in compliance to all current design standards, applicable policies, and construction practices.

We recommend the reference of the Encroachment Permits Manual Chapter 600 Utility Permits for applicable requirements. This manual may be referenced at the following link: http://www.dot.ca.gov/hq/traffops/developserv/permits/encroachment_permits_manual/index.html. In addition to the requirements set forth in the Encroachment Permits Manual, we also recommend referencing the Right of Way Manual Chapter 13 at: http://www.dot.ca.gov/hq/row/rowman/manual/, and the Project Development Procedures Manual Chapter 17 at: http://www.dot.ca.gov/hq/oppd/pdpm/pdpmn.htm. Please contact the Encroachment Permits Department for additional information at:

Encroachment Permits Department
464 W 4th Street MS 619
San Bernardino, CA 92401-1400
(909) 383-4526
(909) 383-4224 FAX
http://www.dot.ca.gov/hq/traffops/developserv/permits/

Thank you for providing us this opportunity to review the NOP for the Recycled Water Distribution Pipeline Expansion Project EA/DEIR and for your consideration of these and future comments. These recommendations are preliminary and summarize our review of materials provided for our evaluation. If this proposal is revised in any way, please forward appropriate information to this Office so that updated recommendations for impact mitigation may be provided. If you have questions concerning these comments, or would like to meet to discuss our concerns, please contact me at (909) 383-4557 for assistance

Sincerely,

DANIEL KOPULSKY
Office Chief
Community Planning, IGR/CEQA Review

Department of Toxic Substances Control

Linda S. Adams
Secretary for
Environmental Protection

Maziar Movassaghi, Acting Director
5796 Corporate Avenue
Cypress, California 90630

Arnold Schwarzenegger
Governor

March 10, 2010

Mr. Keith S. Dunbar, P.E.
K.S. Dunbar & Associates, Inc.
3035 Calle Frontera
San Clemente, California 92673-3012
ksdpe@cox.net

NOTICE OF PREPARATION FOR AN ENVIRONMENTAL ASSESSMENT/ DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE RECYCLED WATER DISTRIBUTION PIPELINE EXPANSION PROJECT, RIVERSIDE COUNTY

Dear Mr. Dunbar:

The Department of Toxic Substances Control (DTSC) has received your submitted Notice of Preparation (NOP) for an Environmental Assessment/Environmental Impact Report (EA/EIR) for the above-mentioned Project. The following project description is stated in your document: "The Recycled Water Distribution Pipeline Expansion Project (Project) is intended to design and construct secondary distribution piping to serve existing landscape demand while supporting future development. The Project is broken into five "sub-projects" based on geographic location. These are: Diamond Valley Menifee, French Valley, Moreno Valley/Perris North and San Jacinto. Combined these projects include approximately 89,405 lineal feet (16.9 miles) of pipeline varying in size from 8-inch diameter up to 24-inch diameter. These developer projects are considered "conversions" and are located throughout Eastern Municipal Water District (EMWD)'s service area. These conversion projects have been strategically located in geographic vicinities which are both close to existing large potable water landscape users (retrofits) and planned future development". DTSC has the following comments:

1) The EIR should identify the current or historic uses in the Project area that may have resulted in a release of hazardous wastes/substances, and any known or potentially contaminated sites within the proposed Project area. For all identified sites, the EIR should evaluate whether conditions at the site may pose a threat to human health or the environment. Following are the databases of some of the pertinent regulatory agencies:

- National Priorities List (NPL): A list maintained by the United States Environmental Protection Agency (U.S.EPA).

Printed on Recycled Paper

- EnviroStor: A Database primarily used by the California Department of Toxic Substances Control, accessible through DTSC's website (see below).

- Resource Conservation and Recovery Information System (RCRIS): A database of RCRA facilities that is maintained by U.S. EPA.

- Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS): A database of CERCLA sites that is maintained by U.S.EPA.

- Solid Waste Information System (SWIS): A database provided by the California Integrated Waste Management Board which consists of both open as well as closed and inactive solid waste disposal facilities and transfer stations.

- Leaking Underground Storage Tanks (LUST) / Spills, Leaks, Investigations and Cleanups (SLIC): A list that is maintained by Regional Water Quality Control Boards.

- Local Counties and Cities maintain lists for hazardous substances cleanup sites and leaking underground storage tanks.

- The United States Army Corps of Engineers, 911 Wilshire Boulevard, Los Angeles, California, 90017, (213) 452-3908, maintains a list of Formerly Used Defense Sites (FUDS).

2) The EIR should identify the mechanism to initiate any required investigation and/or remediation for any site that may be contaminated, and the government agency to provide appropriate regulatory oversight. If necessary, DTSC would require an oversight agreement in order to review such documents. Please see comment No. 11 below for more information.

3) All environmental investigations, sampling and/or remediation for the site should be conducted under a Workplan approved and overseen by a regulatory agency that has jurisdiction to oversee hazardous substance cleanup. The findings of any investigations, including any Phase I or II Environmental Site Assessment Investigations should be summarized in the document. All sampling results in which hazardous substances were found should be clearly summarized in a table.

4) Proper investigation, sampling and remedial actions overseen by the respective regulatory agencies, if necessary, should be conducted in the Project area prior to the new development or any construction. All closure, certification or remediation approval reports by these agencies should be included in the EIR.

5) If buildings or other structures, asphalt or concrete-paved surface areas are being planned to be demolished, an investigation should be conducted for the presence of other related hazardous chemicals, lead-based paints or products, mercury, and asbestos containing materials (ACMs). If other hazardous chemicals, lead-based paints or products, mercury or ACMs are identified, proper precautions should be taken during demolition activities. Additionally, the contaminants should be remediated in compliance with California environmental regulations and policies.

6) Project construction may require soil excavation or filling in certain areas. Sampling may be required. If soil is contaminated, it must be properly disposed and not simply placed in another location onsite. Land Disposal Restrictions (LDRs) may be applicable to such soils. Also, if the project proposes to import soil to backfill the areas excavated, sampling should be conducted to ensure that the imported soil is free of contamination.

7) Human health and the environment of sensitive receptors should be protected during construction or demolition activities. If it is found necessary, a site investigation and a health risk assessment overseen and approved by the appropriate government agency and a qualified health risk assessor should be conducted to determine if there are, have been, or will be, any releases of hazardous materials that may pose a risk to human health or the environment.

8) If it is determined that hazardous wastes are, or will be, generated by the proposed operations, the wastes must be managed in accordance with the California Hazardous Waste Control Law (California Health and Safety Code, Division 20, Chapter 6.5) and the Hazardous Waste Control Regulations (California Code of Regulations, Title 22, Division 4.5). If it is determined that hazardous wastes will be generated, the facility should also obtain a United States Environmental Protection Agency Identification Number by contacting (800) 618-6942. Certain hazardous waste treatment processes or hazardous materials, handling, storage or uses may require authorization from the local Certified Unified Program Agency (CUPA). Information about the requirement for authorization can be obtained by contacting your local CUPA.

9) If during construction/demolition of the project, the soil and/or groundwater contamination is suspected, construction/demolition in the area should cease and appropriate health and safety procedures should be implemented.

10) If the site was used for agricultural, livestock or related activities, onsite soils and groundwater might contain pesticides, agricultural chemical, organic waste or other related residue. Proper investigation, and remedial actions, if necessary, should be conducted under the oversight of and approved by a government agency at the site prior to construction of the project.

11) DTSC can provide guidance for cleanup oversight through an Environmental Oversight Agreement (EOA) for government agencies that are not responsible parties under CERCLA, or a Voluntary Cleanup Agreement (VCA) for private parties. For additional information on the EOA or VCA, please see www.dtsc.ca.gov/SiteCleanup/Brownfields, or contact Ms. Maryam Tasnif-Abbasi, DTSC's Voluntary Cleanup Coordinator, at (714) 484-5489.

If you have any questions regarding this letter, please contact Mr. Rafiq Ahmed, Project Manager, at rahmed@dtsc.ca.gov or by phone at (714) 484-5491.

Sincerely,

Greg Holmes
Unit Chief
Brownfields and Environmental Restoration Program - Cypress Office

cc: Governor's Office of Planning and Research
State Clearinghouse
P.O. Box 3044
Sacramento, California 95812-3044
state.clearinghouse@opr.ca.gov

CEQA Tracking Center
Department of Toxic Substances Control
Office of Environmental Planning and Analysis
1001 I Street, 22nd Floor, M.S. 22-2
Sacramento, California 95814
ADelacr1@dtsc.ca.gov

CEQA# 2827

State Water Resources Control Board

Division of Financial Assistance
1001 I Street, Sacramento, California 95814• (916) 341-5700
Mailing Address: P.O. Box 944212 • Sacramento, California 94244-2120
FAX (916) 341-5707 • http://www.waterboards.ca.gov

Linda S. Adams
Secretary for
Environmental Protection

Arnold Schwarzenegger
Governor

MAR 2 3 2010

Mr. Keith Dunbar
Eastern Municipal Water District
3035 Calle Frontera
San Clemente, CA 92673

Dear Mr. Dunbar:

NOTICE OF PREPARATION (NOP) FOR EASTERN MUNICIPAL WATER DISTRICT (DISTRICT); RECYCLED WATER DISTRIBUTION PIPELINE EXPANSION PROJECT (PROJECT); STATE CLEARINGHOUSE NO. 2010031001

We understand the District is pursuing Clean Water State Revolving Fund (CWSRF) financing for this Project. As a funding agency and a state agency with jurisdiction by law to preserve, enhance, and restore the quality of California's water resources, the State Water Resources Control Board (State Water Board) is providing the following information for the environmental document prepared for the Project.

We would appreciate notice of any hearings or meetings held regarding environmental review of any projects to be funded by the State Water Board, and look forward to reviewing the draft Environmental Impact Report (EIR) for the Project. Once the EIR is certified, please provide the following documents applicable to the Project: (1) Two copies of the draft and final EIR, (2) the resolution certifying the EIR, adopting a Mitigation Monitoring and Reporting Program (MMRP) and a Statement of Overriding Considerations, if applicable, and making California Environmental Quality Act (CEQA) findings, (3) all comments received during the review period and the District response to those comments, (4) the adopted final MMRP, and (5) a date stamped copy of the Notice of Determination filed with the Governor's Office of Planning and Research.

The CWSRF Program is partially funded by the U.S. Environmental Protection Agency (USEPA), and requires additional "CEQA-Plus" environmental documentation and review. Four information sheets are included that further explain the CWSRF environmental compliance process and additional federal requirements in the CWSRF Program. In addition, an evaluation form is included for the District to submit to the State Water Board Project Manager. The State Water Board can consult directly with agencies responsible for implementing federal environmental laws and regulations. Any environmental issues raised by federal agencies or their representatives will need to be resolved prior to State Water Board approval of a CWSRF financing commitment for the Project. For further information on the environmental compliance process in the CWSRF Program, please contact Ms. Michelle Lobo at (916) 341-6983.

It is important to note that prior to a CWSRF financing commitment, projects are subject to provisions of the federal Endangered Species Act and must obtain approval from the U.S. Fish and Wildlife Service (USFWS), and/or the National Marine Fisheries Service (NMFS) for any potential effects to special status species. Please be advised that the State Water Board can consult with the USFWS and/or NMFS on behalf of the District regarding all federal special status species the Project has the potential to impact.

The District will need to identify whether the Project will involve any direct effects from construction activities, or indirect effects, such as growth inducement, that may affect federally-listed threatened, endangered, or candidate species that are known, or have a potential to occur on-site, in the surrounding areas, or in the service area. Please identify applicable conservation measures to reduce such effects, if any.

CWSRF projects must comply with Section 106 of the National Historic Preservation Act. The State Water Board has been delegated responsibility for carrying out the requirements of Section 106 under a Nationwide Programmatic Agreement executed for the CWSRF Program by the USEPA, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers.

As stated above, the State Water Board has responsibility for ensuring compliance with Section 106 and the State Water Board's Cultural Resources Officer (CRO) consults directly with the State Historic Preservation Officer (SHPO). SHPO consultation is initiated when sufficient information is provided by the CWSRF applicant for projects having the potential to impact cultural resources. Please contact the State Water Board's CRO, Ms. Cookie Hirn at 916-341-5690, with any questions on how to begin the Section 106 compliance process. Note that the District will need to identify the Area of Potential Effects (APE), including construction areas, staging areas, and depth of any excavation.

Please provide the CRO with a copy of the current Records Search for the Project area, and include maps that show all recorded sites and surveys in relation to the APE for the Project. The APE is three-dimensional and includes all areas that may be affected by the Project. The APE includes the surface area and extends below ground to the depth of any Project excavations. The Records Search request should be made for an area larger than the APE. The appropriate area varies for different projects, but should be drawn large enough to provide information on what types of sites may exist in the vicinity.

Native American and Interested Party Consultation are required for Section 106 compliance:

- A Project description and map should be sent to the Native American Heritage Commission (NAHC). The NAHC will provide a list of Native American tribes and individuals that are culturally affiliated with your Project area and recommend that they all be contacted
- A Project description and map should be sent to everyone on the list provided by the NAHC, asking for information on the Project area
- Similar letters should be sent to local historical organizations
- Follow-up contact should be made by phone and a phone log should be included

Comments from the NAHC, local tribes and historical organizations affiliated with the Project area, as well as the District response to these comments should be included in the submittal to the CRO.

Other federal requirements pertinent to the Project under the CWSRF Program include the following:

A. Compliance with the federal Clean Air Act: (a) Provide air quality studies that may have been done for the Project; and (b) if the Project is in a nonattainment area or attainment area subject to a maintenance plan; (i) provide a summary of the estimated emissions (in tons per year) that are expected from both the construction and operation of the Project for each federal criteria pollutant in a nonattainment or maintenance area, and indicate if the nonattainment designation is moderate, serious, severe, or extreme; (ii) if emissions are above the federal de minimis levels, but the Project is sized to meet only the needs of current population projections that are used in the approved State Implementation Plan for air quality, quantitatively indicate how the proposed capacity increase was calculated using population projections (See Code of Federal Regulations, [40CFR93.153]).

B. Compliance with the Wild and Scenic Rivers Act: Identify whether or not Wild and Scenic Rivers would be potentially impacted by the Project, and include conservation measures to minimize such impacts.

C. Compliance with the Migratory Bird Treaty Act (Act): List any birds that are protected under this Act that may be impacted by the Project, and identify conservation measures to minimize such impacts.

D. Protection of Wetlands: Identify whether or not the Project or construction activities impact streams, flood control channels, or wetlands. Identify the status of coordination with the U.S. Army Corps of Engineers and measures to avoid, minimize, or mitigate for impacts.

E. Compliance with the Flood Plain Management Act: Identify whether the Project is within the 100-year flood zone and include a flood map.

F. Compliance with the Farmland Protection Policy Act: Identify whether the Project will result in the conversion of farmland. State the status of farmland (Prime, Unique, or Local Statewide Importance) in the Project area and determine if this area is under a Williamson Act Contract.

G. Compliance with the Coastal Zone Management Act: Identify whether the Project is within a coastal zone and the status of any coordination with the California Coastal Commission.

Following are specific comments on the NOP:

The State Water Board's web page has information on Low Impact Development (LID) that may be applicable to this Project. Identify any Project features (e.g., roads, parking lots, and other hard surfaces) that could benefit from LID practices. LID information can be located at: www.waterboards.ca.gov/water_issues/programs/low_impact_development/.

The State Water Board has no further comments on the NOP at this time. Thank you once again for the opportunity to review the District's environmental document. If you have any questions or concerns, please feel free to contact me at (916) 327-9401, or contact Ms. Justine Herrig at (916) 327-9117.

Sincerely,

Lisa Lee
Environmental Scientist

Enclosures (5)

cc: State Clearinghouse
(Re: SCH# 2010031001)
P. O. Box 3044
Sacramento, CA 95812-3044

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 · www.aqmd.gov

March 9, 2010

Mr. Keith S. Dunbar, P.E., BCEE, F. ASCE
K.S. Dunbar
3035 Calle Frontera
San Clemente, CA 92673

Dear Mr. Dunbar:

Notice of Preparation of a Draft Environmental Impact Report (Draft EIR) for the Recycled Water Distribution Pipeline Expansion Project

The South Coast Air Quality Management District (SCAQMD) appreciates the opportunity to comment on the above-mentioned document. The SCAQMD's comments are recommendations regarding the analysis of potential air quality impacts from the proposed project that should be included in the draft environmental impact report (EIR). Please send the SCAQMD a copy of the Draft EIR upon its completion. **In addition, please send with the draft EIR all appendices or technical documents related to the air quality analysis and electronic versions of all air quality modeling and health risk assessment files. Electronic files include spreadsheets, database files, input files, output files, etc., and does not mean Adobe PDF files. Without all files and supporting air quality documentation, the SCAQMD will be unable to complete its review of the air quality analysis in a timely manner. Any delays in providing all supporting air quality documentation will require additional time for review beyond the end of the comment period.**

Air Quality Analysis

The SCAQMD adopted its California Environmental Quality Act (CEQA) Air Quality Handbook in 1993 to assist other public agencies with the preparation of air quality analyses. The SCAQMD recommends that the Lead Agency use this Handbook as guidance when preparing its air quality analysis. Copies of the Handbook are available from the SCAQMD's Subscription Services Department by calling (909) 396-3720. Alternatively, the lead agency may wish to consider using the California Air Resources Board (CARB) approved URBEMIS 2007 Model. This model is available on the SCAQMD Website at: www.urbemis.com.

The Lead Agency should identify any potential adverse air quality impacts that could occur from all phases of the project and all air pollutant sources related to the project. Air quality impacts from both construction (including demolition, if any) and operations should be calculated. Construction-related air quality impacts typically include, but are not limited to, emissions from the use of heavy-duty equipment from grading, earth-loading/unloading, paving, architectural coatings, off-road mobile sources (e.g., heavy-duty construction equipment) and on-road mobile sources (e.g., construction worker vehicle trips, material transport trips). Operation-related air quality impacts may include, but are not limited to, emissions from stationary sources (e.g., boilers), area sources (e.g., solvents and coatings), and vehicular trips (e.g., on- and off-road tailpipe emissions and entrained dust). Air quality impacts from indirect sources, that is, sources that generate or attract vehicular trips should be included in the analysis.

The SCAQMD has developed a methodology for calculating PM2.5 emissions from construction and operational activities and processes. In connection with developing PM2.5 calculation methodologies, the SCAQMD has also developed both regional and localized significance thresholds. The SCAQMD requests that the lead agency quantify PM2.5 emissions and compare the results to the recommended PM2.5 significance thresholds. Guidance for calculating PM2.5 emissions and PM2.5 significance thresholds can be found at the following internet address: http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html.

In addition to analyzing regional air quality impacts the SCAQMD recommends calculating localized air quality impacts and comparing the results to localized significance thresholds (LSTs). LST's can be used in addition to the recommended regional significance thresholds as a second indication of air quality impacts when preparing a CEQA document. Therefore, when preparing the air quality analysis for the proposed project, it is recommended that the lead agency perform a localized significance analysis by either using the LSTs developed by the SCAQMD or performing dispersion modeling as necessary. Guidance for performing a localized air quality analysis can be found at http://www.aqmd.gov/ceqa/handbook/LST/LST.html.

In the event that the proposed project generates or attracts vehicular trips, especially heavy-duty diesel-fueled vehicles, it is recommended that the lead agency perform a mobile source health risk assessment. Guidance for performing a mobile source health risk assessment ("Health Risk Assessment Guidance for Analyzing Cancer Risk from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis") can be found on the SCAQMD's CEQA web pages at the following internet address: http://www.aqmd.gov/ceqa/handbook/mobile_toxic/mobile_toxic.html. An analysis of all toxic air contaminant impacts due to the decommissioning or use of equipment potentially generating such air pollutants should also be included.

Mitigation Measures

In the event that the project generates significant adverse air quality impacts, CEQA requires that all feasible mitigation measures that go beyond what is required by law be utilized during project construction and operation to minimize or eliminate significant adverse air quality impacts. To assist the Lead Agency with identifying possible mitigation measures for the project, please refer to Chapter 11 of the SCAQMD CEQA Air Quality Handbook for sample air quality mitigation measures. Additional mitigation measures can be found on the SCAQMD's CEQA web pages at the following internet address: www.aqmd.gov/ceqa/handbook/mitigation/MM_intro.html Additionally, SCAQMD's Rule 403 – Fugitive Dust, and the Implementation Handbook contain numerous measures for controlling construction-related emissions that should be considered for use as CEQA mitigation if not otherwise required. Other measures to reduce air quality impacts from land use projects can be found in the SCAQMD's Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning. This document can be found at the following internet address: http://www.aqmd.gov/prdas/aqguide/aqguide.html. In addition, guidance on siting incompatible land uses can be found in the California Air Resources Board's Air Quality and Land Use Handbook: A Community Perspective, which can be found at the following internet address: http://www.arb.ca.gov/ch/handbook.pdf. CARB's Land Use Handbook is a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process. Pursuant to state CEQA Guidelines §15126.4 (a)(1)(D), any impacts resulting from mitigation measures must also be discussed.

Data Sources

SCAQMD rules and relevant air quality reports and data are available by calling the SCAQMD's Public Information Center at (909) 396-2039. Much of the information available through the Public Information Center is also available via the SCAQMD's World Wide Web Homepage (http://www.aqmd.gov).

The SCAQMD is willing to work with the Lead Agency to ensure that project-related emissions are accurately identified, categorized, and evaluated. Please call Ian MacMillan, Program Supervisor, CEQA Section, at (909) 396-3244 if you have any questions regarding this letter.

Sincerely,

Ian V. MacMillan

Ian MacMillan
Program Supervisor, CEQA Inter-Governmental Review
Planning, Rule Development & Area Sources

IM:AK
RVC100302-04AK
Control Number

CITY OF MENIFEE

Planning Department

Carmen Cave · Community Development Director

Wallace W. Edgerton
Mayor

Fred Twyman
Mayor Pro Tem

John V. Denver
Councilmember

Darcy Kuenzi
Councilmember

Scott A. Mann
Councilmember

March 11, 2010

K.S. Dunbar & Associates, Inc.
3035 Calle Frontera
San Clemente, CA 92673
Attn: Keith S. Dunbar, P.E., BCEE, F.ASCE

RE: City of Menifee Planning Department Comments on the NOP for the DEIR for Recycled Water Distribution Pipeline Expansion Project

Dear Mr. Dunbar:

Thank you for providing an opportunity for the City of Menifee Planning Department to review the Notice of Preparation (NOP) for the DEIR for the Recycled Water Distribution Pipeline Expansion Project.

The DEIR should identify how impacts related to noise, dust, air quality, traffic and hazardous materials are mitigated for residential uses within the vicinity of new pipeline installation.

In addition, the Planning Department is concerned with the amount of traffic the proposed project may generate during construction. The DEIR should identify that the City will require an encroachment permit for all work within the City's public right-of-way and a construction traffic management plan to mitigate impacts to traffic and circulation during construction.

If import or export is proposed, haul routes should be identified and impacts associated with the haul of import and/or export to the surrounding community and residential should be analyzed. If haul routes are proposed within the City of Menifee, haul permits from the City will be required.

Thank you again for the opportunity to review the NOP for this project. Please forward any subsequent environmental documents regarding the project to my attention at this office.

Sincerely,

City of Menifee Planning Department

Lisa Sheldon, Senior Planner

29714 Haun Road
Menifee, CA 92586
Phone 951.672.6777
Fax 951.679.3843
www.cityofmenifee.us

CITY OF PERRIS

HABIB MOTLAGH, CITY ENGINEER

P8-000

MEMORANDUM

TO: Karen Hackett, EMWD
Keith Dunbar, KS Dunbar & Associates

FROM: Habib Motlagh, City Engineer

DATE: March 26, 2010

RE: Notice of Preparation, EMWD Recycled Water Distribution Pipeline Expansion Project

---

Thank you for providing a copy of the Notice of Preparation for the above project to the City of Perris for review and comment. Within the City of Perris, this project is proposed to include construction of a new recycled waterline along Indian Avenue from Morgan Street to the northerly city limit.

At this time we do not have any comments regarding the proposed scope of the EIR. We do offer the following general comments regarding this project:

- There are many large industrial/commercial developments currently being considered along this pipeline corridor. EMWD should familiarize themselves with the construction schedule for these projects. In particular, EMWD should avoid constructing this pipeline immediately after any road widening and repaving by developers.

- Please be sure that plans for this project are carefully coordinated to avoid any future conflicts with drainage facilities proposed in the master drainage plan for North Perris.

We look forward to reviewing the EIR and subsequent improvement plans for this project as they are available.

Cc: Richard Belmudez, City Manager
Brad Eckhardt, Planning Manager

DEPARTMENT OF ENGINEERING
170 WILKERSON AVE., SUITE D, PERRIS, CA 92570-2200
TEL.: (951) 943-6504 - FAX: (951) 943-8416

SAN JACINTO

SJ-001

Memorandum

TO: Karen Hackett, EMWD
Keith Dunbar, KS Dunbar & Associates

FROM: Habib Motlagh, City Engineer

DATE: March 25, 2010

RE: Notice of Preparation, EMWD Recycled Water Distribution Pipeline Expansion Project

---

Thank you for providing a copy of the Notice of Preparation for the above project to the City of San Jacinto for review and comment. Within the City of San Jacinto, this project is proposed to include construction of a new recycled waterline along Cottonwood Avenue from Warren Road to just west of Lyon Avenue.

At this time we do not have any comments regarding the proposed scope of the EIR. We do offer the following general comments regarding this project:

- Within the NOP, the figure showing the location of the pipeline along Cottonwood is labeled "Hemet Figure 6". This label may create confusion as to the jurisdiction in which the construction will take place. It should be changed so as to not refer to Hemet.

- Please be sure that plans for this project are carefully coordinated to avoid any future conflicts with drainage facilities proposed in the joint city/RCFC master drainage plan.

We look forward to reviewing the EIR and subsequent improvement plans for this project as they are available.

Cc: Tim Hults, City Manager
Asher Hartel, Planning

City Engineer's Office

595 S. San Jacinto Avenue • San Jacinto, CA 92583 • Ph (951) 654-3592 • Fax (951) 654-3672
www.ci.san-jacinto.ca.us

March 8, 2010

Attn: Keith S. Dunbar, P.E., F. ASCE
K.S. Dunbar & Associates, Inc.
Environmental Engineering
3035 Calle Frontera
San Clemente, CA 92673-3012

Re: Notice of Preparation of an Evironmental Assesment/Draft EIR for the Recycled Water Distribution Pipeline Expansion Project

The Soboba Band of Luiseño Indians appreciates your observance of Tribal Cultural Resources and their preservation in your project. The information provided to us on said project has been assessed through our Cultural Resource Department, where it was concluded that although it is outside the existing reservation, the project area does fall within the bounds of our Tribal Traditional Use Areas. This project location is in close proximity to known village sites and is a shared use area that was used in ongoing trade between the Luiseno and Cahuilla tribes. Therefore it is regarded as highly sensitive to the people of Soboba.

Soboba Band of Luiseño Indians is requesting the following:

1. **Government to Government** consultation in accordance to SB18. Including the transfer of information to the Soboba Band of Luiseno Indians regarding the progress of this project should be done as soon as new developments occur.

2. Soboba Band of Luiseño Indians continues to be a lead consulting tribal entity for this project.

3. Working in and around traditional use areas intensifies the possibility of encountering cultural resources during the construction/excavation phase. For this reason the Soboba Band of Luiseño Indians requests that Native American Monitor(s) from the Soboba Band of Luiseño Indians Cultural Resource Department to be present during any ground disturbing proceedings. Including surveys and archaeological testing.

4. Request that proper procedures be taken and requests of the tribe be honored (Please see the attachment)

Sincerely,

Joseph Ontiveros
Soboba Cultural Resource Department
P.O. Box 487
San Jacinto, CA 92581
Phone (951) 654-5544 ext. 4137
Cell (951) 663-5279
jontiveros@soboba-nsn.gov

Cultural Items (Artifacts). Ceremonial items and items of cultural patrimony reflect traditional religious beliefs and practices of the Soboba Band. The Developer should agree to return all Native American ceremonial items and items of cultural patrimony that may be found on the project site to the Soboba Band for appropriate treatment. In addition, the Soboba Band requests the return of all other cultural items (artifacts) that are recovered during the course of archaeological investigations. Where appropriate and agreed upon in advance, Developer's archeologist may conduct analyses of certain artifact classes if required by CEQA, Section 106 of NHPA, the mitigation measures or conditions of approval for the Project. This may include but is not limited or restricted to include shell, bone, ceramic, stone or other artifacts.

The Developer should waive any and all claims to ownership of Native American ceremonial and cultural artifacts that may be found on the Project site. Upon completion of authorized and mandatory archeological analysis, the Developer should return said artifacts to the Soboba Band within a reasonable time period agreed to by the Parties and not to exceed (30) days from the initial recovery of the items.

Treatment and Disposition of Remains

A. The Soboba Band shall be allowed, under California Public Resources Code § 5097.98 (a), to (1) inspect the site of the discovery and (2) make determinations as to how the human remains and grave goods shall be treated and disposed of with appropriate dignity.

B. The Soboba Band, as MLD, shall complete its inspection within twenty-four (24) hours of receiving notification from either the Developer or the NAHC, as required by California Public Resources Code § 5097.98 (a). The Parties agree to discuss in good faith what constitutes "appropriate dignity" as that term is used in the applicable statutes.

C. Reburial of human remains shall be accomplished in compliance with the California Public Resources Code § 5097.98 (a) and (b). The Soboba Band, as the MLD in consultation with the Developer, shall make the final discretionary determination regarding the appropriate disposition and treatment of human remains.

D. All parties are aware that the Soboba Band may wish to rebury the human remains and associated ceremonial and cultural items (artifacts) on or near, the site of their discovery, in an area that shall not be subject to future subsurface disturbances. The Developer should accommodate on-site reburial in a location mutually agreed upon by the Parties.

E. The term "human remains" encompasses more than human bones because the Soboba Band's traditions periodically necessitated the ceremonial burning of human remains. Grave goods are those artifacts associated with any human remains. These items, and other funerary remnants and their ashes are to be treated in the same manner as human bone fragments or bones that remain intact

Coordination with County Coroner's Office. The Lead Agencies and the Developer should immediately contact both the Coroner and the Soboba Band in the event that any human remains are discovered during implementation of the Project. If the Coroner recognizes the human remains to be those of a Native American, or has reason to believe that they are those of a Native American, the Coroner shall ensure that notification is provided to the NAHC within twenty-four (24) hours of the determination, as required by California Health and Safety Code § 7050.5 (c).

Non-Disclosure of Location Reburials. It is understood by all parties that unless otherwise required by law, the site of any reburial of Native American human remains or cultural artifacts shall not be disclosed and shall not be governed by public disclosure requirements of the California Public Records Act. The Coroner, parties, and Lead Agencies, will be asked to withhold public disclosure information related to such reburial, pursuant to the specific exemption set forth in California Government Code § 6254 (r).

Ceremonial items and items of cultural patrimony reflect traditional religious beliefs and practices of the Soboba Band. The Developer agrees to return all Native American ceremonial items and items of cultural patrimony that may be found on the project site to the Soboba Band for appropriate treatment. In addition, the Soboba Band requests the return of all other cultural items (artifacts) that are recovered during the course of archaeological investigations. Where appropriate and agreed upon in advance, Developer's archeologist may conduct analyses of certain artifact classes if required by CEQA, Section 106 of NHPA, the mitigation measures or conditions of approval for the Project. This may include but is not limited or restricted to include shell, bone, ceramic, stone or other artifacts.

PECHANGA CULTURAL RESOURCES
Temecula Band of Luiseño Mission Indians

Post Office. Box 2183 • Temecula, CA 92593
Telephone (951) 308-9295 • Fax (951) 506-9491

Chairperson:
Germaine Arenas

Vice Chairperson:
Mary Bear Magee

Committee Members:
Evie Gerber
Darlene Miranda
Bridgett Barcello Maxwell
Aurelia Marruffo
Richard B. Scearce, III

Director:
Gary DuBois

Coordinator:
Paul Macarro

Cultural Analyst:
Anna Hoover

Monitor Supervisor:
Jim McPherson

April 2, 2010

VIA E-MAIL and USPS

Keith Dunbar
K. S. Dunbar & Associates, Inc.
CEO and Project Consultant
3035 Calle Frontera
San Clements, CA 92673

Re: Pechanga Tribe Comments on the Notice of Preparation (NOP) of an Environmental Assessment/Draft Environmental Impact Report (DEIR) for the Recycled Water Distribution Pipeline Expansion Project

Dear Mr. Dunbar:

Thank you for inviting us to submit comments on the above named Project. This comment letter is written on behalf of the Pechanga Band of Luiseño Indians (hereinafter, "the Tribe"), a federally recognized Indian tribe and sovereign government. These comments are not being submitted in lieu of formal consultation under SB 18, which will be required for this Project or under Section 106 if Bureau of Reclamation (BOR) funding is involved.

The Tribe formally requests, pursuant to Public Resources Code §21092.2, to be notified and involved in the entire environmental review process for the duration of the above referenced Project (the "Project"). If you have not already done so, please add the Tribe to your distribution list(s) for public notices and circulation of all documents, including environmental review documents, archaeological reports, and all documents pertaining to this Project. The Tribe further requests to be directly notified of all public hearings and scheduled approvals concerning this Project. The Tribe also requests that these comments be incorporated into the record of approval for this Project as well.

The Tribe submits these comments concerning the Project's potential impacts to cultural resources in conjunction with the environmental review of the Project. The Tribe reserves the right to fully participate in the environmental review process, as well as to provide additional comment on the Project's impacts to cultural resources and potential mitigation for such impacts. Further, the Tribe reserves the right to participate in the regulatory process and provide comment on issues pertaining to the regulatory process and Project approval.

EASTERN MUNICIPAL WATER DISTRICT (EMWD) MUST INCLUDE INVOLVEMENT OF AND CONSULTATION WITH THE PECHANGA TRIBE IN ITS ENVIRONMENTAL REVIEW PROCESS

It has been the intent of the Federal Government[1] and the State of California[2] that Indian tribes be consulted with regard to issues which impact cultural and spiritual resources, as well as other governmental concerns. The responsibility to consult with Indian tribes stems from the unique government-to-government relationship between the United States and Indian tribes. This arises when tribal interests are affected by the actions of governmental agencies and departments. In this case, it is undisputed that the Project lies within the Pechanga Tribe's traditional territory. Therefore, in order to comply with the CEQA and other applicable Federal and California law, it is imperative that EMWD consult with the Tribe in order to guarantee an adequate basis of knowledge for an appropriate evaluation of the Project effects, as well as generating adequate mitigation measures.

LEAD AGENCY CONSULTATION WITH THE PECHANGA TRIBE REQUIRED PURSUANT TO CAL. GOVT. C. §§ 65351, 65352, 65352.3, AND 65352.4 (SENATE BILL 18 – TRADITIONAL TRIBAL CULTURAL PLACES LAW)

In the event that a General Plan, General Plan Amendment, Specific Plan or Specific Plan Amendment will be processed on this Project, the Lead Agency is required to consult with the Pechanga Tribe pursuant to a State law entitled Traditional Tribal Cultural Places (also known as SB 18; Cal. Govt. C. § 65352.3). The purpose of consultation is to identify any Native American sacred places and any geographical areas which could potentially yield sacred places, identify proper means of treatment and management of such places, and to ensure the protection and preservation of such places through agreed upon mitigation (Cal. Govt. C. 65352.3; SB18, Chapter 905, Section 1(4)(b)(3)).

Consultation must be government-to-government, meaning directly between the Tribe and the Lead Agency, seeking agreement where feasible (Cal. Govt. C. § 65352.4; SB18, Chapter 905, Section 1(4)(b)(3)). Lastly, any information conveyed to the Lead Agency concerning Native American sacred places shall be confidential in terms of the specific identity, location, character and use of those places and associated features and objects. This information is not subject to public disclosure pursuant the California Public Records Act (Cal. Govt. C. 6254(r)).

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[1] See Executive Memorandum of April 29, 1994 on Government-to-Government Relations with Native American Tribal Governments and Executive Order of November 6, 2000 on Consultation and Coordination with Indian Tribal Governments.

[2] See California Public Resource Code §5097.9 et seq.; California Government Code §§65351,65352,65352.3 and 65352.4

SECTION 106 CONSULTATION REQUIREMENTS

The requirements of Section 106 of the NHPA, set forth in 36 CFR Part 800, clearly requires consultation with Indian tribes, regardless of the location of the project (36 CFR 800.2(c)). The regulations go on to state that the agency official *shall* ensure that consultation provides an Indian tribe "a reasonable opportunity to identify its concerns about historic properties, advise on the identification and evaluation of historic properties, including those of traditional religious and cultural importance, articulate its views on the undertaking's effects on such properties, and participate in the resolution of adverse effects." (Id.) Further, consultation must occur early in the planning process in order to "identify and discuss relevant preservation issues and resolve concerns about the confidentiality of information on historic properties." (Id.)

The NOP notice stated that Bureau of Reclamation funding may be involved in this Project. As such, it is the Tribe's request that EMWD and all agencies and consultants involved should commit to working with the Tribe to ensure it has meaningful participation in the environmental review process, which includes all archaeological assessments and testing, as well as devising appropriate mitigation. The Tribe requests that such mitigation take into account the Tribe's preferences and customs concerning treatment of cultural resources.

PECHANGA CULTURAL AFFILIATION TO PROJECT AREA

The Pechanga Tribe asserts that the Project area is part of Luiseño, and therefore the Tribe's, aboriginal territory as evidenced by the existence of Luiseño place names, *tóota yixélval* (rock art, pictographs, petroglyphs), and an extensive Luiseño artifact record in the vicinity of the five sub-areas of the Project. These culturally sensitive areas are affiliated with the Pechanga Band of Luiseño Indians because of the Tribe's cultural ties and traditional knowledge of these areas as well as extensive history in these areas.

The Pechanga Tribe's knowledge of our ancestral boundaries is based on reliable information passed down to us from our elders; published academic works in the areas of anthropology, history and ethno-history; and through recorded ethnographic and linguistic accounts. Many anthropologists and historians include the five sub-areas in their descriptions (Bean 1974; Sparkman 1908; Kroeber 1925; Oxendine 1989; White 1963; Harvey 1974; Smith and Freers 1994), and such territory descriptions correspond with that communicated to the Pechanga people by our elders. While historic accounts and anthropological and linguistic theories are important in determining traditional Luiseño territory, the most critical sources of information used to define our traditional territories are our songs, creation accounts, and oral traditions.

Luiseño history originates with the creation of all things at *'éxva Teméeku*, the present day City of Temecula, and dispersing out to all corners of creation (what is today known as Luiseño territory). It was at Temecula that the first human *Wuyóot* lived and taught the people, and here that he became sick, finally expiring at Lake Elsinore. Many of our songs relate the tale

of the people taking the dying *Wuyóot* to the many hot springs at Elsinore, where he died (DuBois 1908). He was cremated at *'éxva Teméeku*. It is the Luiseño creation account that connects Elsinore to Temecula, and thus to the Temecula people who were evicted and moved to the Pechanga Reservation, and now known as the Pechanga Band of Luiseño Mission Indians (the Pechanga Tribe). From Temecula, the people spread out, establishing villages and marking their territories. The first people also became the mountains, plants, animals and heavenly bodies.

Many traditions and stories are passed from generation to generation by songs. One of the Luiseño songs recounts the travels of the people to Elsinore after a great flood (DuBois 1908). From here, they again spread out to the north, south, east and west. Three songs, called *Monívol*, are songs of the places and landmarks that were destinations of the Luiseño ancestors, several of which are located near the Project area. They describe the exact route of the Temecula (Pechanga) people and the landmarks made by each to claim title to places in their migrations (DuBois 1908:110). In addition, Pechanga elders state that the Temecula/Pechanga people had usage/gathering rights to an area extending from Rawson Canyon on the east, over to Lake Mathews on the northwest, down Temescal Canyon to Temecula, eastward to Aguanga, and then along the crest of the Cahuilla range back to Rawson Canyon. All sub-areas of the Project are located within this culturally affiliated territory. The Native American Heritage Commission (NAHC) Most Likely Descendent (MLD) files substantiate this habitation and migration record from oral tradition. These examples illustrate a direct correlation between the oral tradition and the physical place; proving the importance of songs and stories as a valid source of information outside of the published anthropological data.

Tóota yixélval (rock art) is also an important element in the determination of Luiseño territorial boundaries. *Tóota yixélval* can consist of petroglyphs (incised) elements, or pictographs (painted) elements. The science of archaeology tells us that places can be described through these elements. Riverside and Northern San Diego Counties are home to red-pigmented pictograph panels. Archaeologists have adopted the name for these pictograph-versions, as defined by Ken Hedges of the Museum of Man, as the San Luis Rey style. The San Luis Rey style incorporates elements which include chevrons, zig-zags, dot patterns, sunbursts, handprints, net/chain, anthropomorphic (human-like) and zoomorphic (animal-like) designs. Tribal historians and photographs inform us that some design elements are reminiscent of Luiseño ground paintings. A few of these design elements, particularly the flower motifs, the net/chain and zig-zags, were sometimes depicted in Luiseño basket designs and can be observed in remaining baskets and textiles today.

An additional type of *tóota yixélval*, identified by archaeologists also as rock art or petroglyphs, are cupules. Throughout Luiseño territory, there are certain types of large boulders, taking the shape of mushrooms or waves, which contain numerous small pecked and ground indentations, or cupules. Additionally, according to historian Constance DuBois:

> When the people scattered from Ekvo Temeko, Temecula, they were very powerful. When they got to a place, they would sing a song to make water come there, and would call that place theirs; or they would scoop out a hollow in a rock with their hands to have that for their mark as a claim upon the land. The different parties of people had their own marks. For instance, Albañas's ancestors had theirs, and Lucario's people had theirs, and their own songs of Munival to tell how they traveled from Temecula, of the spots where they stopped and about the different places they claimed (1908:158).

Our songs and stories, as well as academic works and recorded archaeological/cultural sites, demonstrate that the Luiseño people who occupied the Project area are ancestors of the present-day Pechanga Band of Luiseño Indians, and as such, Pechanga is the appropriate culturally affiliated tribe for projects that impact this geographic area.

The Tribe has a long history of working with EMWD and being the Lead Tribe on Projects within its jurisdiction. We have additional information regarding specific place names and sensitive cultural areas that the sub-areas of the project may impact which are not included in this letter to protect their confidentiality. We welcome the opportunity to meet with EMWD to further explain and provide documentation and information concerning our specific cultural affiliation to and knowledge of these lands and the Project area.

PROJECT IMPACTS TO CULTURAL RESOURCES

The proposed Project is located in a highly sensitive region of Luiseño territory and the Tribe believes that the possibility for recovering cultural resources during ground-disturbing activities is high. The Tribe has over thirty-five (35) years of experience in working with various types of construction projects throughout its territory. The combination of this knowledge and experience, along with the knowledge of the culturally-sensitive areas and oral tradition, is what the Tribe relies on to make fairly accurate predictions regarding the likelihood of subsurface resources in a particular location.

To date, the Tribe has not received any environmental documentation for review on the Project. The Tribe requests to be involved and participate with EMWD in assuring that an adequate environmental assessment is completed for the entire Project, including analysis of off-site impacts and in developing all monitoring and mitigation plans and measures for the duration of the Project. Because of the sensitivity of the area, we request a thorough archaeological study be conducted for all sub-areas of the Project by a Riverside County qualified archaeologist. It is further the position of the Pechanga Tribe that Pechanga tribal monitors be required to be present during all cultural resource surveys, and archaeological and ground-disturbing activities conducted in connection with the Project, including any additional archaeological excavations performed. The Tribe also requests that all analysis of impacts to cultural resources for this Project area must necessarily include all cultural resources in the vicinity, even if such complexes exist adjacent to or nearby each sub-area of the Project.

Given the sensitivity of the area, inadvertent discoveries are foreseeable impacts and thus need to be appropriately mitigated for within the confines of the Project. It is imperative that adequate cultural resources assessments be performed in conjunction with the Project approval and environmental review process. The identification of surface resources during an archaeological survey should not be the sole determining factor in deciding whether mitigation measures for inadvertent discoveries are required. The cultural significance of the area, provided in consultation with the Pechanga Tribe, should play a large part in determining whether specifications concerning unanticipated discoveries should be included.

REQUESTED TRIBAL INVOLVEMENT AND MITIGATION

The proposed Project is on land that is within the traditional territory of the Pechanga Band of Luiseño Indians. The Pechanga Band is not opposed to this Project. The Tribe's primary concerns stem from the Project's proposed impacts on Native American cultural resources. The Tribe is concerned about both the protection of unique and irreplaceable cultural resources, such as Luiseño village sites, sacred sites and archaeological items which would be displaced by ground disturbing work on the Project, and on the proper and lawful treatment of cultural items, Native American human remains and sacred items likely to be discovered in the course of the work.

The CEQA Guidelines state that lead agencies should make provisions for inadvertent discoveries of cultural resources (CEQA Guidelines §15064.5). As such, it is the position of the Pechanga Tribe that an agreement specifying appropriate treatment of inadvertent discoveries of cultural resources be executed between EMWD and the Pechanga Tribe.

The Tribe believes that adequate cultural resources assessments and management must always include a component which addresses inadvertent discoveries. Every major State and Federal law dealing with cultural resources includes provisions addressing inadvertent discoveries (See e.g.: CEQA (Cal. Pub. Resources Code §21083.2(i); 14 CCR §1506a.5(f)); Section 106 (36 CFR §800.13); NAGPRA (43 CFR §10.4). Moreover, most state and federal agencies have guidelines or provisions for addressing inadvertent discoveries (See e.g.: FHWA, Section 4(f) Regulations - 771.135(g); CALTRANS, Standard Environmental Reference - 5-10.2 and 5-10.3). Because of the extensive presence of the Tribe's ancestors within the Project area, it is not unreasonable to expect to find vestiges of that presence. Such cultural resources and artifacts are significant to the Tribe as they are reminders of their ancestors. Moreover, the Tribe is expected to protect and assure that all cultural sites of its ancestors are appropriately treated in a respectful manner. Therefore, as noted previously, it is crucial to adequately address the potential for inadvertent discoveries.

Further, the Pechanga Tribe believes that if human remains are discovered, State law would apply and the mitigation measures and conditions of approval for the permit must account for this. According to the California Public Resources Code, § 5097.98, if Native American

human remains are discovered, the Native American Heritage Commission must name a "most likely descendant," who shall be consulted as to the appropriate disposition of the remains. Given the Project's location in Pechanga territory, the Pechanga Tribe intends to assert its right pursuant to California law with regard to any remains or items discovered in the course of this Project.

PROJECT MITIGATION MEASURES

The Pechanga Tribe will itself be engaging in further assessment of the Project area, in consultation with tribal elders, to identify more specific information about this culturally sensitive area. The Tribe understands that an Initial Study and an Environmental Impact Report still must be prepared for this Project. The Tribe requests that EMWD, project Consultant Keith Dunbar and the Project Archaeologist work directly with the Tribe to thoroughly evaluate and assess potential impacts to the Project Area, including any proposed off-site impacts. Moreover, the Tribe possesses necessary information about the archaeological and cultural sensitivity that an archaeological survey alone will not reveal, and should be consulted with at the earliest possible stage of the environmental review to assist in identifying and mitigating the cultural resources impacts for this Project. The Tribe also requests to be included in any site visits and surveys to assist the Project Archaeologist in assessing impacts to cultural resources in the Project area.

Once that process is completed, the Tribe may submit additional suggested mitigation to specifically address impacts to any sites or resources found during the archaeological site assessments. For the present time, the Tribe asks that, at a minimum, EMWD include the following mitigation measures in its environmental assessment documents:

MM 1 Prior to beginning Project construction, EMWD shall retain a Riverside County qualified archaeological monitor to monitor all ground-disturbing activities in an effort to identify any unknown archaeological resources. Any newly discovered cultural resource deposits shall be subject to a cultural resources evaluation.

MM 2 At least 30 days prior to beginning Project construction, EMWD shall contact the Pechanga Tribe to notify the Tribe of grading, excavation and the monitoring program, and to develop a Cultural Resources Treatment and Monitoring Agreement. The Agreement shall address the treatment of known cultural resources, the designation, responsibilities, and participation of Native American Tribal monitors during grading, excavation and ground disturbing activities; Project grading and development scheduling; terms of compensation for tribal monitors; and treatment and final disposition of any cultural resources, sacred sites, and human remains discovered on the site.

MM 3 Prior to beginning Project construction, the Project Archaeologist shall file a pre-grading report with EMWD (if required) to document the proposed methodology for grading activity observation. Said methodology shall include the requirement

for a qualified archaeological monitor to be present and to have the authority to stop and redirect grading activities. In accordance with the agreement required in MM 2, the archaeological monitor's authority to stop and redirect grading will be exercised in consultation with the Pechanga Tribe in order to evaluate the significance of any archaeological resources discovered on the property. Tribal monitors shall be allowed to monitor all grading, excavation and groundbreaking activities, and shall also have the authority to stop and redirect grading activities in consultation with the Project archaeologist.

MM 4 If human remains are encountered, California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the Riverside County Coroner has made the necessary findings as to origin. Further, pursuant to California Public Resources Code Section 5097.98(b) remains shall be left in place and free from disturbance until a final decision as to the treatment and disposition has been made. If the Riverside County Coroner determines the remains to be Native American, the Native American Heritage Commission must be contacted within 24 hours. The Native American Heritage Commission must then identify the "most likely descendant(s)" within 48 hours of receiving notification of the discovery. The most likely descendant(s) shall then make recommendations, and engage in consultations concerning the treatment of the remains as provided in Public Resources Code 5097.98 and the Treatment Agreement described in MM 2.

MM 5 The landowner shall relinquish ownership of all cultural resources, including sacred items, burial goods and all archaeological artifacts that are found on the Project area to the Pechanga Tribe for proper treatment and disposition.

MM 6 All sacred sites, should they be encountered within the Project area, shall be avoided and preserved as the preferred mitigation, if feasible.

MM 7 If inadvertent discoveries of subsurface archaeological resources are discovered during grading, EMWD, the Project Archaeologist, and the Tribe shall assess the significance of such resources and shall meet and confer regarding the mitigation for such resources. EMWD shall make the determination of significance if the Tribe and project Archaeologist cannot agree on the significance or the mitigation for such resources, based on the provisions of the California Environmental Quality Act with respect to archaeological resources and shall take into account the religious beliefs, customs, and practices of the Pechanga Tribe.

The Pechanga Tribe looks forward to working together with EMWD and K. S. Dunbar and Associates, Inc. in protecting the invaluable Pechanga cultural resources found in the Project area. Please contact me at 951-308-9295 X8104 once you have had a chance to review these

comments so that we might address any outstanding issues concerning the Project as well as to schedule SB18 consultation. Thank you.

Sincerely,

Anna Hoover
Cultural Analyst

Cc Pechanga Office of the General Counsel
Karen Hackett, Eastern Municipal Water District

Appendix C

Biological Resources Supporting Information

Table C-1. Summary of occurrence of special-status flora and fauna in the service areas of the EMWD Recycled Water Pipeline Expansion Project based on CNDDB records (2010).

Taxon **Family** ***Genus species* (common name)**	**Service Area**				
	Diamond Valley	**Menifee**	**French Valley**	**Moreno Valley Perris North**	**San Jacinto**
FLORA – Dicots					
ASTERACEAE (Sunflower Family)					
Hemizonia mohavensis (Mojave tarplant)	X				
Centromadia pungens spp. *laevis* (smooth tarplant)	X	X	X		X
BORAGINACEAE (Borage Family)					
Harpagonella palmeri (Palmer's grappling hook)			X		
BRASSICACEAE (Mustard Family)					
Caulanthus simulans (Payson's jewelflower)			X	X	
Lepidium virginicum var. *robinsonii* (Robertson's pepper grass)	X				
GERANIACEAE (Geranium Family)					
Erodium macrophyllum (round-leaved filaree)		X	X		
MALVACEAE (Mallow Family)					
Sidalcea neomexicana (Salt Spring checkerbloom)					X
NYCTAGINACEAE (Four O'Clock Family)					
Abronia villosa var. *aurita* (chaparral sand-verbena)	X				X
POLEMONIACEAE (Phlox Family)					
Navarretia fossalis (spreading navarretia)	X	X			
POLYGONACEAE (Buckwheat Family)					
Chorizanthe parryi (Parry's spineflower)	X	X	X		
Chorizanthe polygonoides var. *longispina* (long-spined spineflower)		X	X	X	
FLORA - Monocots					
LILIACEAE (Lily Family)					
Allium munzii (Munz's onion)			X		

Table C-1. Summary of occurrence of special-status flora and fauna in the service areas of the EMWD Recycled Water Pipeline Expansion Project based on CNDDB records (2010).

Taxon **Family** ***Genus species* (common name)**	Service Area				
	Diamond Valley	**Menifee**	**French Valley**	**Moreno Valley Perris North**	**San Jacinto**
Brodiaea filifolia (thread-leaved brodiaea)				X	
POACEAE (Grass Family) *Orcuttia californica* (California Orcutt grass)		X			
FAUNA - Invertebrates					
STREPTOCEPHALIDAE Streptocephalid (Fairy Shrimp Family) *Steptocephalus woottoni* (Riverside fairy shrimp)			X		
BRANCHINECTIDAE (Branchinectid Fairy Shrimp Family) *Branchinecta lynchi* (vernal pool fairy shrimp)			X		
NYMPHALIDAE (Nymphalid Butterfly Family) *Euphydryas editha quino* (Quino checkerspot)			X		
FAUNA - Amphibians					
AMBYSTOMATIDAE (Ambystomatid Salamander Family) *Ambystoma californiense* (California tiger salamander)	X				X
PELOBATIDAE (Spadefoot Family) *Spea hammondii* (western spadefoot)	X	X	X		
FAUNA - Reptiles					
IGUANIDAE (Iguana Family) *Phrynosoma coronatum* (*blainvillii* population) (coast horned lizard)	X			X	X
TEIIDAE (Whiptail Family) *Aspidoscelis hyperythrea* (orange-throated whiptail) *Aspidoscelis tigris stejnegeri* (coastal western whiptail)	X X	X X	X	X	X
EUBLEPHARIDAE (Gecko Family) *Coleonyx variegates abbotti* (San Diego banded gecko)	X				
BOIDAE (Boa Family)					

Table C-1. Summary of occurrence of special-status flora and fauna in the service areas of the EMWD Recycled Water Pipeline Expansion Project based on CNDDB records (2010).

Taxon **Family** ***Genus species* (common name)**	**Service Area**				
	Diamond Valley	**Menifee**	**French Valley**	**Moreno Valley Perris North**	**San Jacinto**
Charina trivirgata (rosy boa)	X				
VIPERIDAE (Viper Family)					
Crotalus ruber ruber (northern red-diamond rattlesnake)	X	X		X	X
FAUNA - Birds					
ACCIPITRADE (Raptor Family)					
Haliaeetus leucocephalus (bald eagle)			X		
Aquila chrysaetos (golden eagle)		X			
Buteo regalis (ferruginous hawk)		X			X
ALAUDIDAE (Lark Family)					
Eremophila alprestris actia (California horned lark)		X			
CUCULIDAE (Cuckoos and Relatives Family)					
Coccyzus americanus occidentalis (western yellow-billed cuckoo)					X
EMBERIZIDAE (Emberizine Sparrow Subfamily)					
Amphispiza belli belli (Bell's sage sparrow)	X	X	X		X
Aimophila ruficeps canescens (southern California rufous-crowned sparrow)	X	X	X		X
LANIIDAE (Shrike Family)					
Lanius ludovicianus (loggerhead shrike)					X
STRIGIFORMES (Owl Family)					
Athene cunicularia (burrowing owl)	X	X	X	X	X
SYLVIIDAE (Old World Warbler and Gnatcatcher Family)					
Polioptila californica californica (coastal California gnatcatcher)	X	X	X	X	
ICTERIDAE (Blackbird Family)					
Agelaius tricolor (tricolored blackbird)					X

Table C-1. Summary of occurrence of special-status flora and fauna in the service areas of the EMWD Recycled Water Pipeline Expansion Project based on CNDDB records (2010).

Taxon **Family** ***Genus species* (common name)**	**Service Area**				
	Diamond Valley	**Menifee**	**French Valley**	**Moreno Valley Perris North**	**San Jacinto**
TRESKIORNITHIDAE (Ibis Family)					
Plegadis chihi (white-faced ibis)					X
FAUNA - Mammals					
VESPERTILIONIDAE (Vesper Bat Family)					
Lasiurus xanthinus (western yellow bat)	X	X		X	X
MOLOSSIDAE (Free-tailed Bat Family)					
Eumops perotis californicus (western mastiff bat)		X		X	
Nyctinomops femorosaccus (pocketed free-tailed bat)				X	
HETERROMYIDAE (Kangaroo Rat and Pocket Mouse Family)					
Chaetodipus fallax fallax (northwestern San Diego pocket mouse)		X	X		
Dipodomys stephensi (Stephens' kangaroo rat)	X	X	X	X	
Perognathus longimembris brevinasus (Los Angeles pocket mouse)		X		X	
Chaetodipus californicus femoralis (Dulzura pocket mouse)		X			
LEPORIDAE (Rabbit and Hare Family)					
Lepus californicus bennettii (San Diego black-tailed jackrabbit)		X	X		
MURIDAE (Mice, Rate and Vole Family)					
Neotoma lepida intermedia (San Diego desert woodrat)	X				
Onychomys torridus ramona (southern grasshopper mouse)		X			
MUSTELIDAE (Weasel and Relatives Family)					
Taxidea taxus (American badger)					X

Appendix D

Cultural Resources Supporting Information

1

CULTURAL RESOURCES ASSESSMENT OF THE PROPOSED EMWD RECYCLED WATER DISTRIBUTION PIPELINE EXPANSION PROJECT RIVERSIDE COUNTY, CALIFORNIA

Prepared for:

K. S. Dunbar & Associates, Inc.
3035 Calle Frontera
San Clemente, CA 92673

Prepared by:

Peak & Associates, Inc.
3941 Park Drive, Suite 20, #329
El Dorado Hills, CA 95762

May 13, 2010
Job # 10-010

INTRODUCTION

The Eastern Municipal Water District, as part of its Recycled Water Distribution Project, proposes installation of about 17 miles of connecting pipelines in five separate project areas in western Riverside County (Figure 1). All of the pipelines will be installed beneath existing roads.

Details of the proposed installations are depicted on Figures 2-8. The specific project areas are:

EMWD Recycled Water Distribution Project
Legal Locations

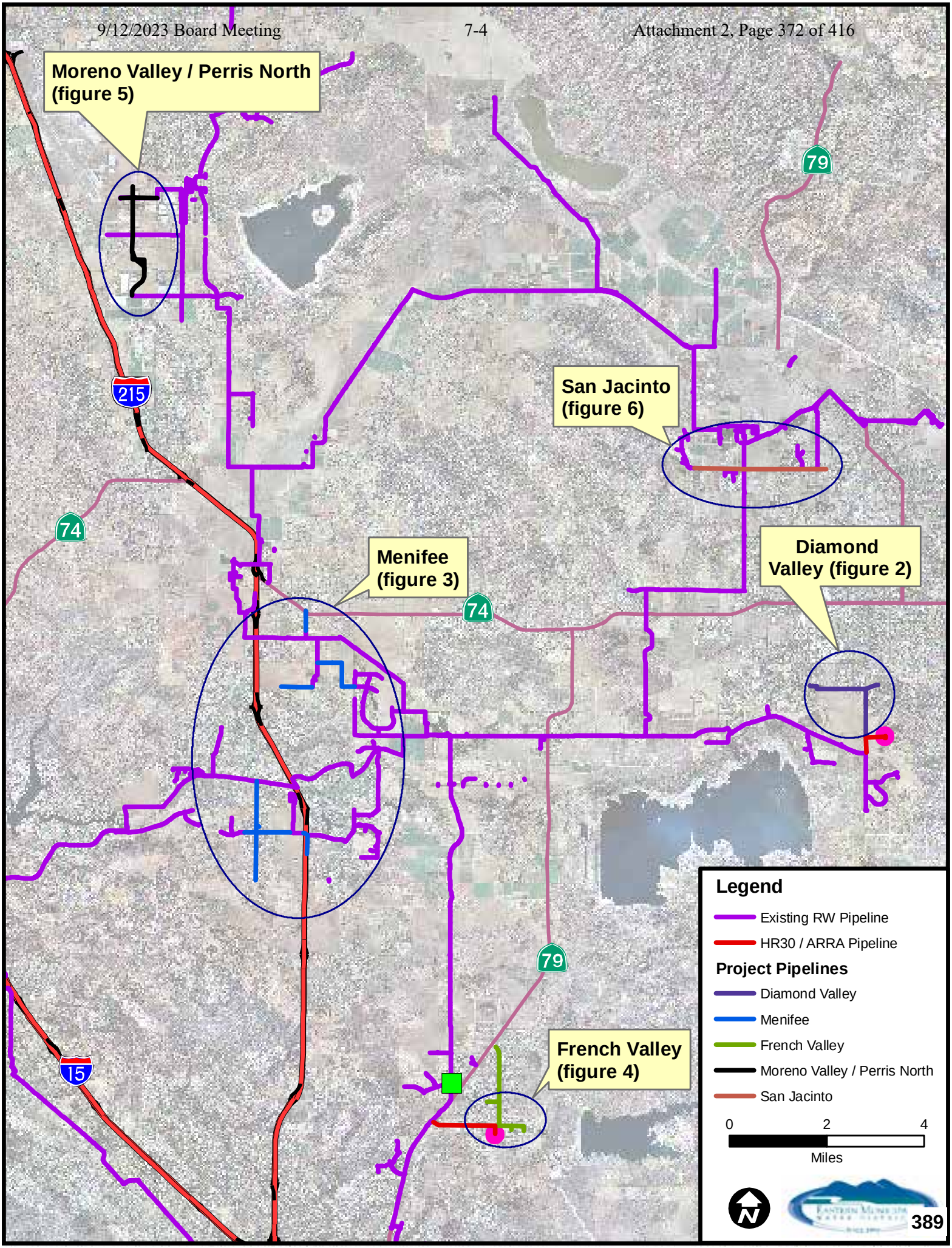
Project Element	USGS Quad	Figure	T	R	Sections
Diamond Valley	Hemet	2	5S	1W	21, 22, 27
Menifee (N)	Romoland	3	5S	3W	10, 11, 14, 15 22, 23
Menifee (S)	Romoland	4	6S	3W	2, 3, 4
French Valley	Bachelor Mountain	5	6S 7S	2W 2W	29, 32, 33 4, 5
Moreno Valley/ Perris North	Perris	6	3S 4S	3W 3W	31 6, 7
San Jacinto (W)	Lakeview	7	4S	1W	29, 30, 31, 32
San Jacinto (E)	San Jacinto	8	4S	1W	None (Rancho San Jacinto Viejo)

In order to assess the potential for impact to cultural resources, Peak & Associates, Inc., requested a record search from the Eastern Information Center and a check of the Sacred Lands File from the Native American Heritage Commission.

INFORMATION CENTER RECORD SEARCH

A review of records maintained by the Eastern Information Center of the California Historical Resources Information System was completed by center staff on March 2, 2010 (Appendix A). Due to a mapping error an addendum record search had to be conducted for a portion of the project alignment that was omitted from the original record search request. This report is also in Appendix A.

The record searches revealed that almost all of the project area has already been examined by qualified archeologists for the presence of cultural resources. The bulk of


Moreno Valley / Perris North (figure 5)
San Jacinto (figure 6)
Menifee (figure 3)
Diamond Valley (figure 2)
French Valley (figure 4)
215
74
79
15
Legend
Existing RW Pipeline
HR30 / ARRA Pipeline
Project Pipelines
Diamond Valley
Menifee
French Valley
Moreno Valley / Perris North
San Jacinto
0
2
4
Miles

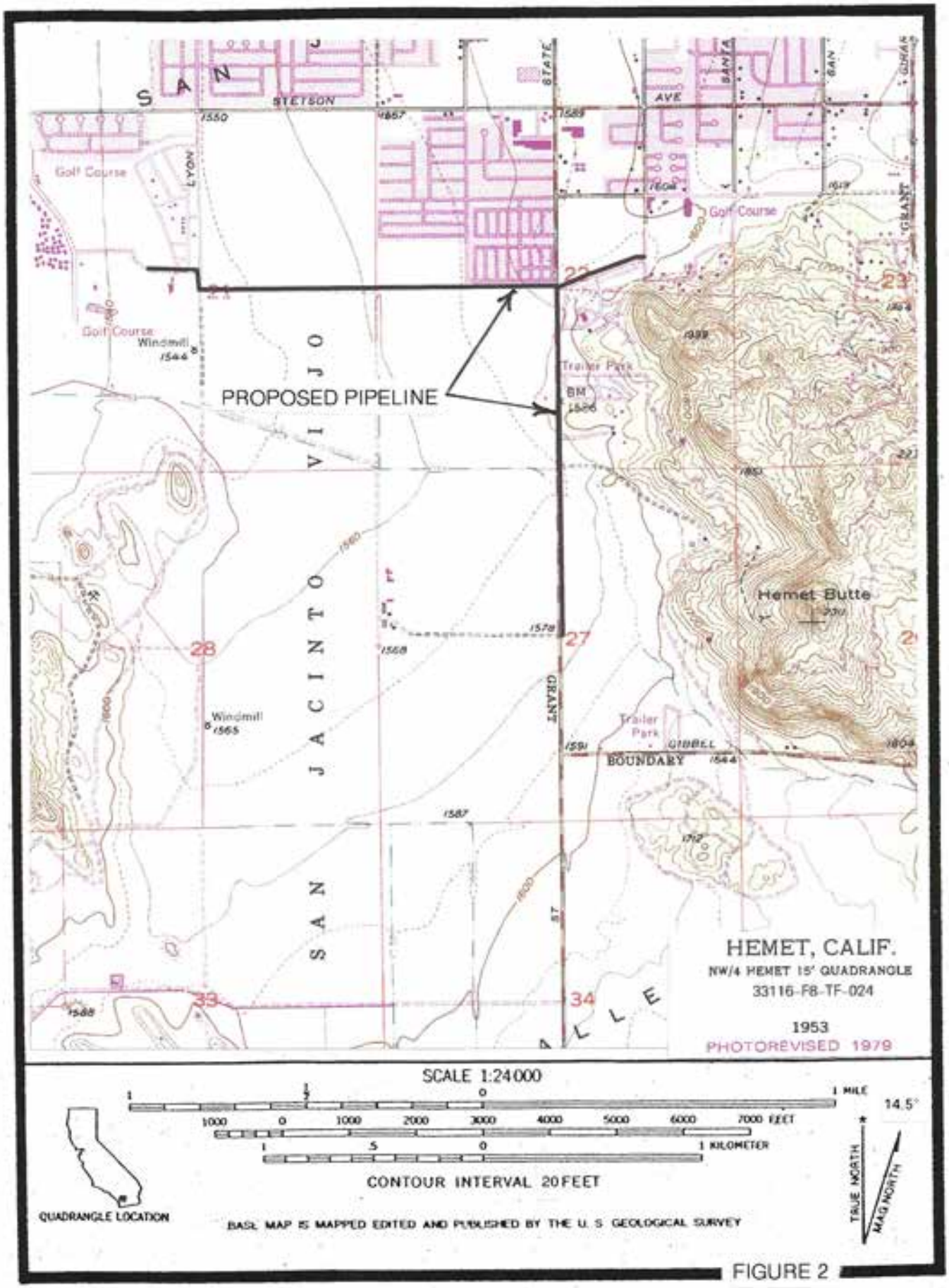

PROPOSED PIPELINE
STETSON
AVE
LYON
STATE
GRANT
Golf Course
Windmill
Trailer Park
BM
Hemet Butte
GIBBEL
BOUNDARY
SAN JACINTO VALLEY
HEMET, CALIF.
NW/4 HEMET 15' QUADRANGLE
33116-F8-TF-024
1953
PHOTOREVISED 1979
SCALE 1:24000
1 MILE
7000 FEET
1 KILOMETER
CONTOUR INTERVAL 20 FEET
QUADRANGLE LOCATION
BASE MAP IS MAPPED EDITED AND PUBLISHED BY THE U. S. GEOLOGICAL SURVEY
TRUE NORTH
MAG NORTH
14.5°

FIGURE 2

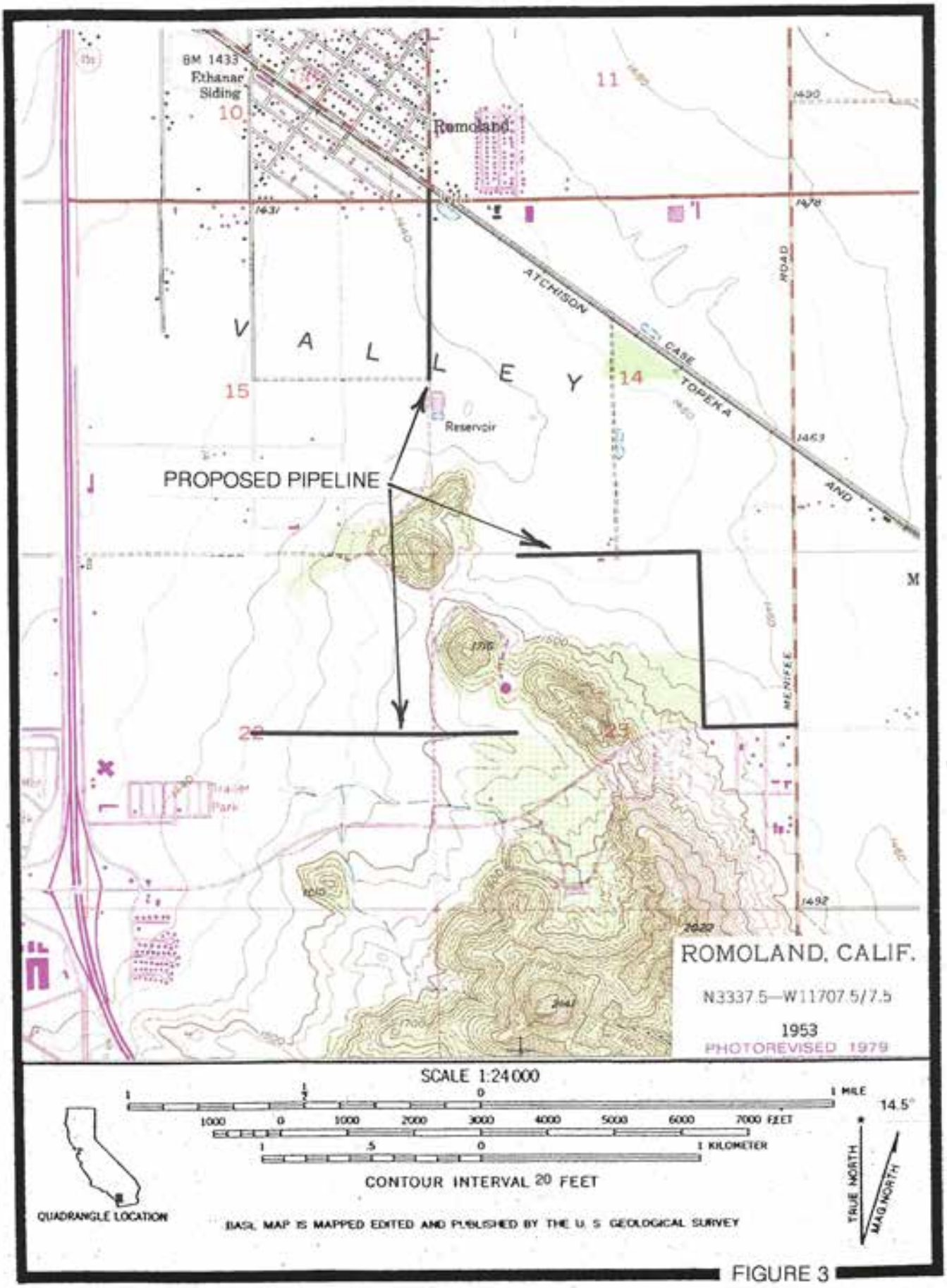

BM 1433
Ethanac Siding
Romoland
10
11
15
14
22
23
V A L L E Y
ATCHISON
CASE
TOPEKA
AND
ROAD
MENIFEE
Reservoir
PROPOSED PIPELINE
ROMOLAND, CALIF.
N3337.5—W11707.5/7.5
1953
PHOTOREVISED 1979
SCALE 1:24000
1 MILE
7000 FEET
1 KILOMETER
CONTOUR INTERVAL 20 FEET
QUADRANGLE LOCATION
BASIL MAP IS MAPPED EDITED AND PUBLISHED BY THE U. S. GEOLOGICAL SURVEY
14.5°
TRUE NORTH
MAG NORTH

FIGURE 3

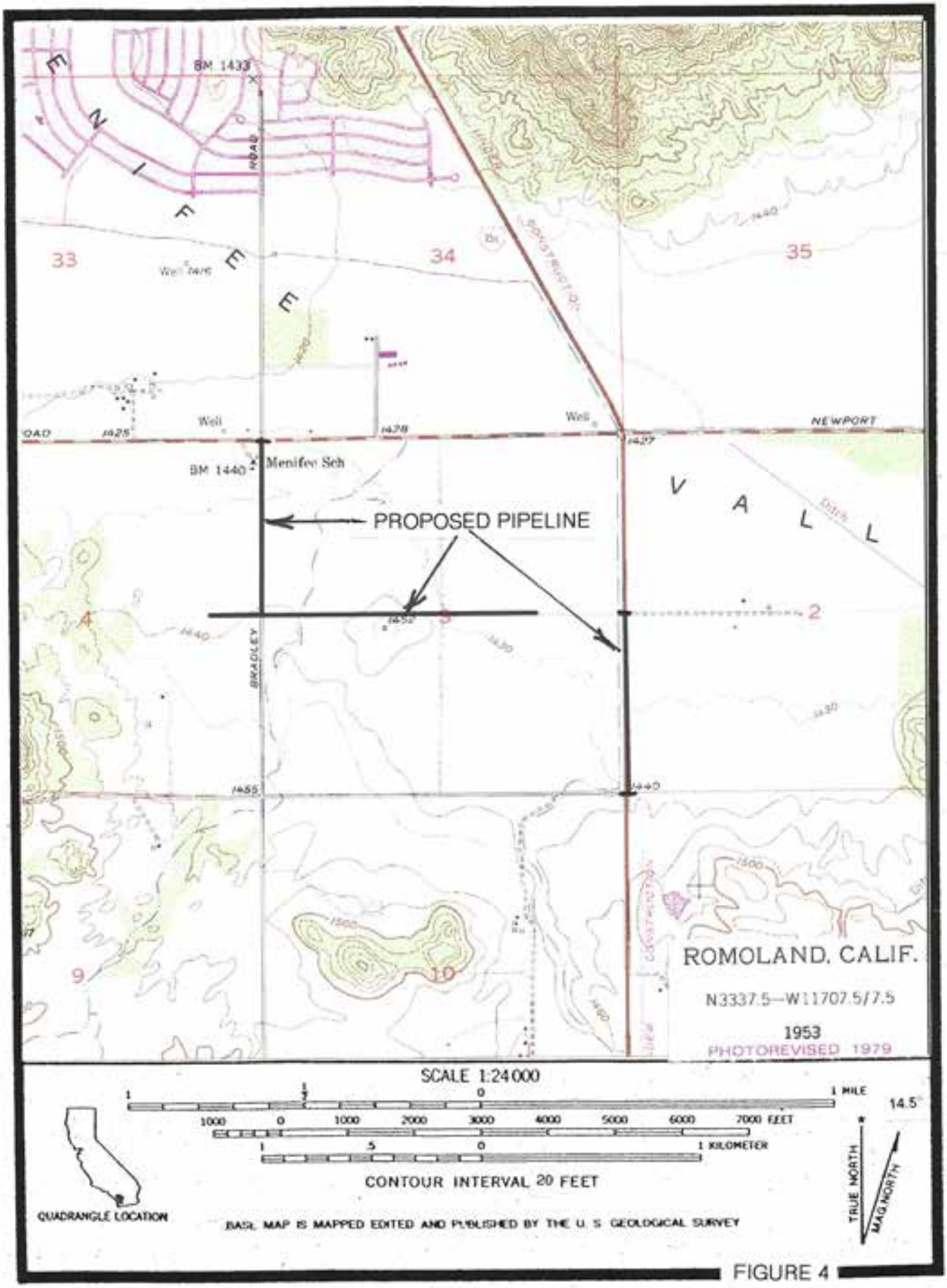

BM 1433
33
34
35
Well
Well
Well
NEWPORT
BM 1440
Menifee Sch
PROPOSED PIPELINE
V A L L
BRADLEY
ROMOLAND, CALIF.
N3337.5—W11707.5/7.5
1953
PHOTOREVISED 1979
SCALE 1:24000
1 MILE
7000 FEET
1 KILOMETER
CONTOUR INTERVAL 20 FEET
QUADRANGLE LOCATION
BASE MAP IS MAPPED EDITED AND PUBLISHED BY THE U. S. GEOLOGICAL SURVEY
TRUE NORTH
MAG NORTH
14.5°

FIGURE 4

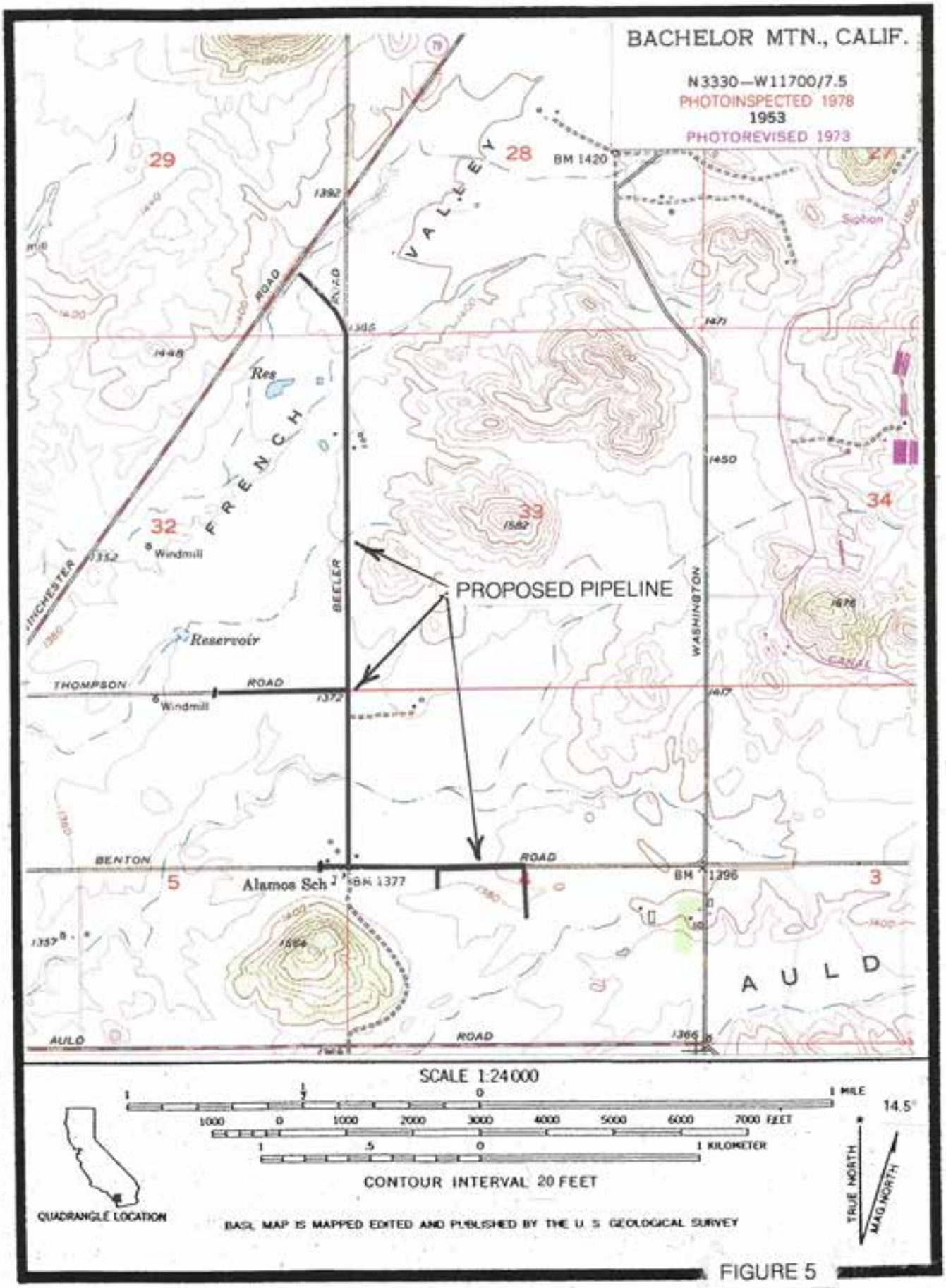

BACHELOR MTN., CALIF.
N3330—W11700/7.5
PHOTOINSPECTED 1978
1953
PHOTOREVISED 1973
PROPOSED PIPELINE
FRENCH VALLEY
BEELER ROAD
WASHINGTON
THOMPSON ROAD
BENTON ROAD
AULD ROAD
Alamos Sch
Windmill
Reservoir
Res
Siphon
BM 1420
BM 1377
BM 1396
29
28
27
32
33
34
5
4
3
SCALE 1:24 000
1 MILE
7000 FEET
1 KILOMETER
CONTOUR INTERVAL 20 FEET
QUADRANGLE LOCATION
BASE MAP IS MAPPED EDITED AND PUBLISHED BY THE U. S. GEOLOGICAL SURVEY
TRUE NORTH
MAG NORTH
14.5°

FIGURE 5

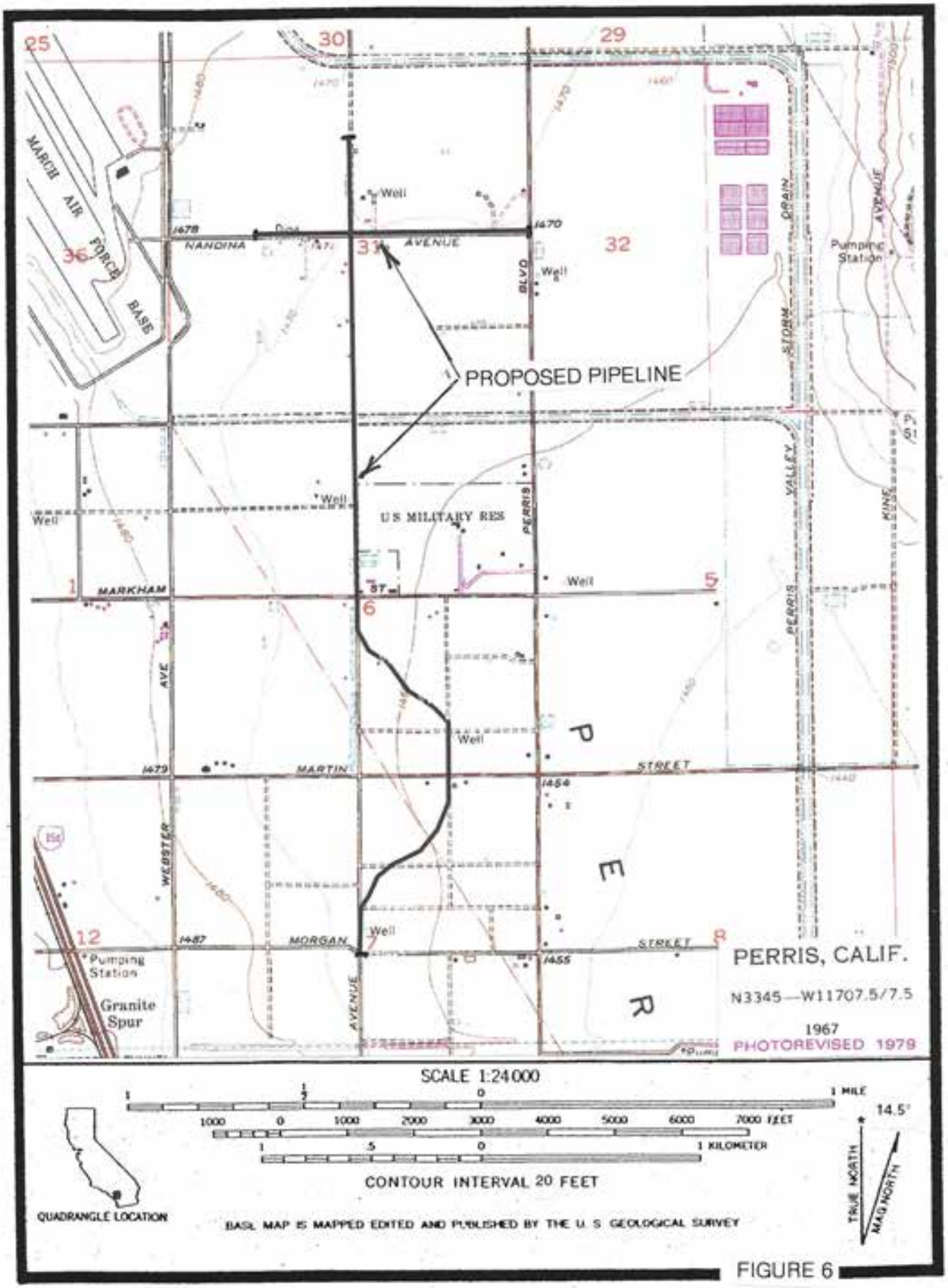

PROPOSED PIPELINE
MARCH AIR FORCE BASE
NANDINA AVENUE
BLVD
PERRIS
US MILITARY RES
MARKHAM ST
MARTIN STREET
MORGAN STREET
WEBSTER AVE
AVENUE
STORM DRAIN
VALLEY AVENUE
KING
Pumping Station
Granite Spur
Well
PERRIS, CALIF.
N3345—W11707.5/7.5
1967
PHOTOREVISED 1978
SCALE 1:24000
1 MILE
7000 FEET
1 KILOMETER
CONTOUR INTERVAL 20 FEET
QUADRANGLE LOCATION
BASE MAP IS MAPPED EDITED AND PUBLISHED BY THE U. S. GEOLOGICAL SURVEY
TRUE NORTH
MAG NORTH
14.5°

FIGURE 6

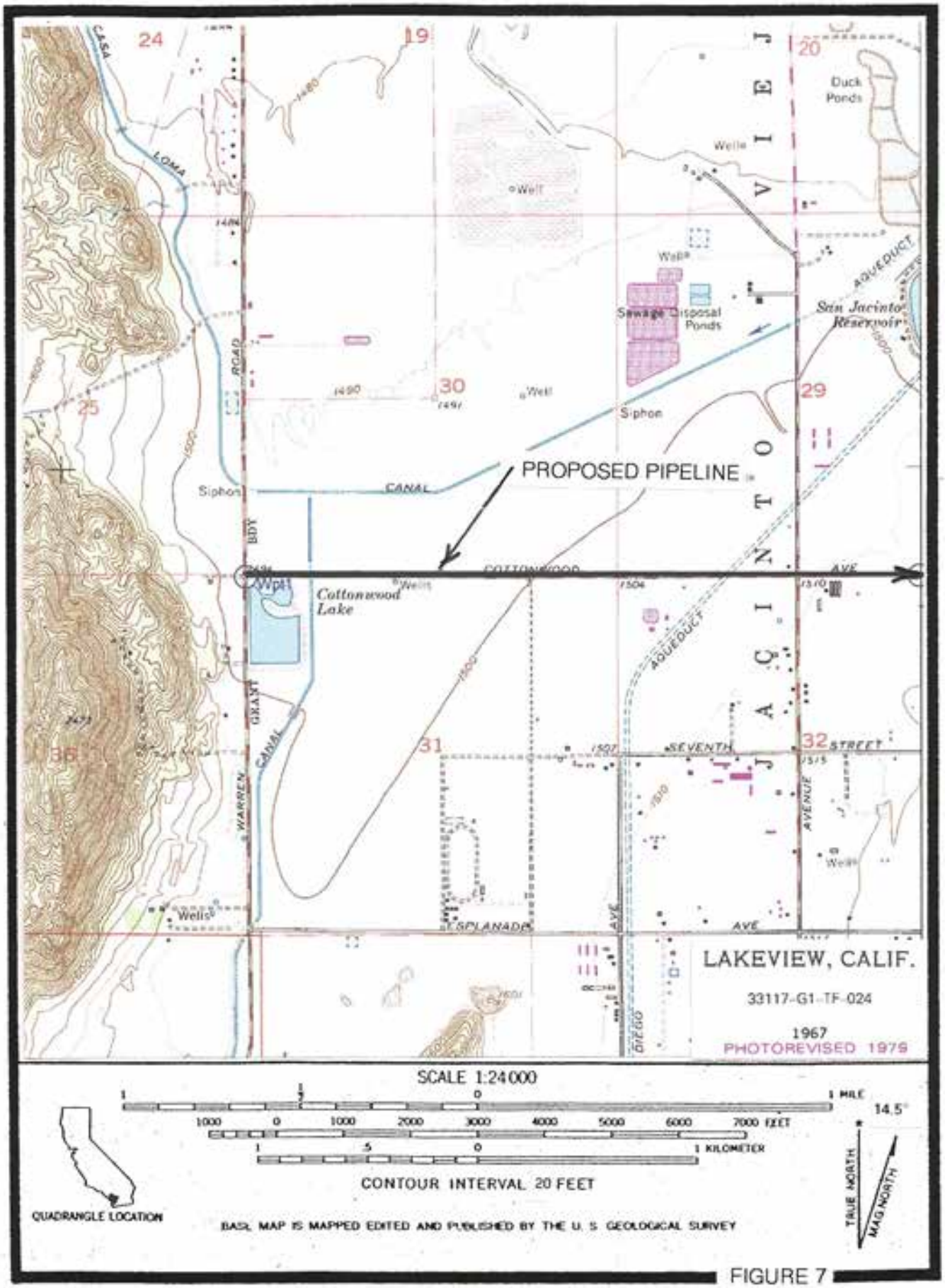

PROPOSED PIPELINE
Cottonwood Lake
Sewage Disposal Ponds
San Jacinto Reservoir
Duck Ponds
Siphon
CANAL
AQUEDUCT
COTTONWOOD AVE
SEVENTH STREET
ESPLANADA AVE
WARREN ROAD
GRANT CANAL
CASA LOMA
LAKEVIEW, CALIF.
33117-G1-TF-024
1967
PHOTOREVISED 1979
SCALE 1:24000
1 MILE
7000 FEET
1 KILOMETER
CONTOUR INTERVAL 20 FEET
QUADRANGLE LOCATION
BASE MAP IS MAPPED EDITED AND PUBLISHED BY THE U. S. GEOLOGICAL SURVEY
TRUE NORTH
MAG NORTH
14.5°

FIGURE 7

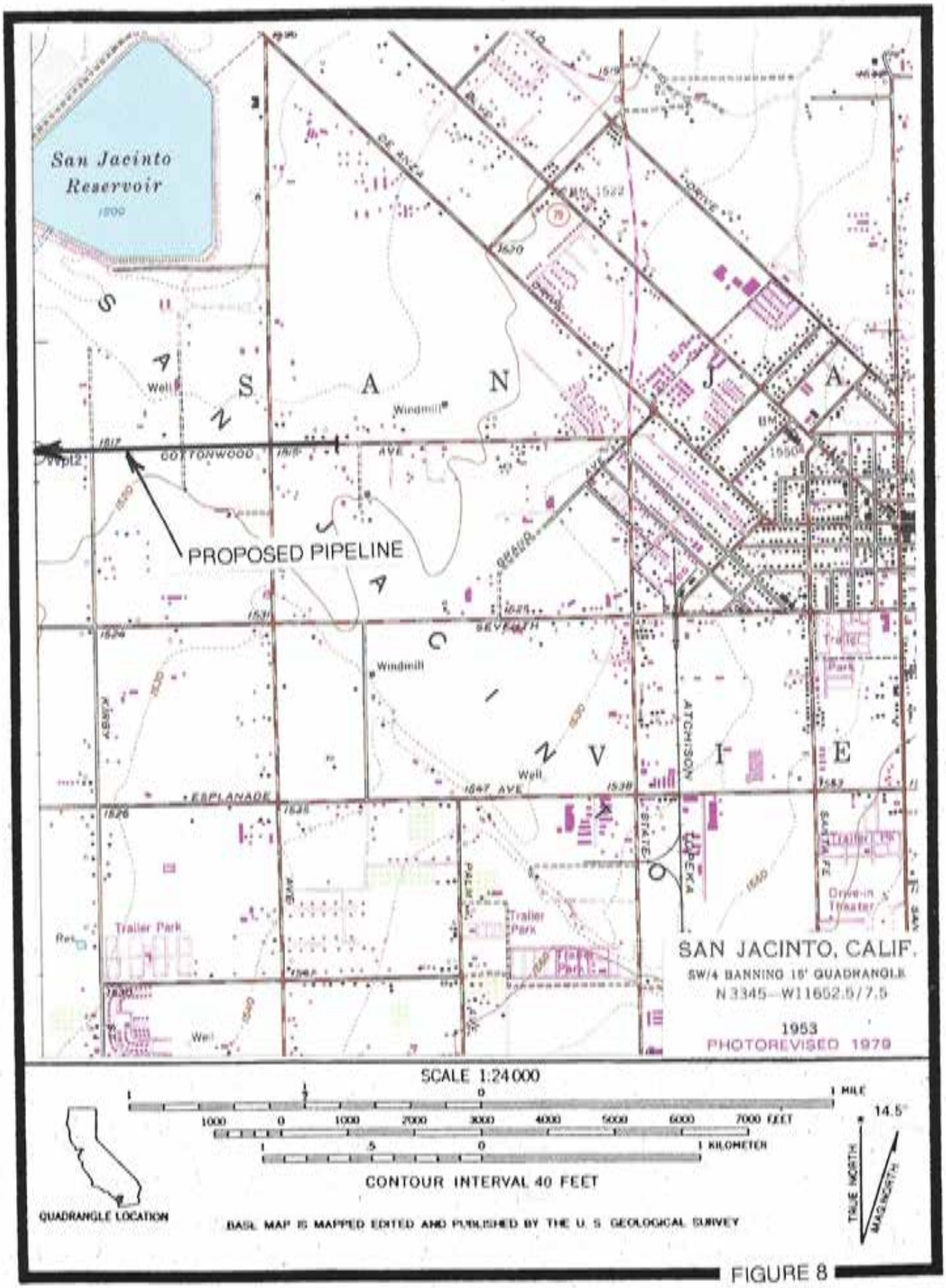

San Jacinto Reservoir
PROPOSED PIPELINE
COTTONWOOD AVE
SEVENTH
ESPLANADE
ATCHISON TOPEKA
SANTA FE
Trailer Park
Drive-in Theater
Windmill
Well
SAN JACINTO, CALIF.
SW/4 BANNING 15' QUADRANGLE
N 3345—W11652.5/7.5
1953
PHOTOREVISED 1979
SCALE 1:24 000
1 MILE
7000 FEET
1 KILOMETER
CONTOUR INTERVAL 40 FEET
QUADRANGLE LOCATION
BASE MAP IS MAPPED EDITED AND PUBLISHED BY THE U. S. GEOLOGICAL SURVEY
TRUE NORTH
MAGNETIC NORTH
14.5°

FIGURE 8

the field inspections had involved large area surveys of properties adjacent to the current project elements, usually for proposed subdivisions, rather than surveys focused on the roadways. However, because the only way to determine if there might be resources extending under the roadway is to examine adjoining open land, this is actually an advantage in this case. For individual project areas:

Diamond Valley The areas south of Pepper Tree Drive (Eckhardt and Canico 1978) and south of Chambers and west of State (Drover 1968; Romano and Robinson 1994) have been surveyed as well as a small section east of State. No sites have been recorded. A small section on Chambers east of State has not been surveyed, but there is a modern subdivision on the south and flat, former agricultural land on the north. It is not a sensitive area.

Menifee All project elements have been surveyed on at least one side except for a half mile of pipeline on the current and future alignment of Chambers Avenue (not the Chambers in the Diamond Valley project element.) Much of this has a new subdivision on the south side and all of the north side is open flat agricultural land. There are no rock exposures in this area that might have grinding slicks or petroglyphs.

The only recorded site in the project vicinity is P-33-015743, the San Jacinto Valley Railroad. The far northern end of the project touches the railroad, which is the same as the modern railroad mainline in this area.

Surveys were performed by: Bodmer *et al.* 2008; Bouscaren and McCarthy 1984; Cooley 2008; Drover 1989a, 1989b, 2003; Hogan and Tang 2008a; Smith and Buysse 2002; and Tang *et al.* 2003;

French Valley Portions of this project element were the subject of the addendum record search. There is no portion of the proposed project area that has not had adjacent surveys. There are two recorded sites in the project vicinity, both Euro-American. P-33-011233 is a small section of rock retaining wall along Winchester Road near the northern end of the proposed pipeline. P-33-016991 is the site of the former Alamos School, depicted on the modern USGS map. This site is located south of Benton Road.

Relevant surveys include: Collins and Smith 2006; Cooley and Patterson 2008; de Barros 2007; Delu and Reynolds 2000; Demack and Velechovsky 2002; Dice 2004; Drover 1990a, 1990b; and Keller 1991.

Moreno Valley/Perris North There is no portion of the proposed project area that has not had adjacent surveys. Portions of the project area have been covered by: Clifford and Smith 2005; Harrison 2003; Love and Tang 1999; McCarthy 1987; McKenna 2005; Sanka 2007; Tang *et al.* 2007; and White and White 2006.

No cultural resources have been recorded near this project element.

San Jacinto All of this project element has been surveyed, including a survey of Cottonwood Avenue, the only street involved in this project element (Wells 1975). The only recorded site is the Reflection Lake RV Park (P-33-015741) located south of Cottonwood and called Cottonwood Lake of the modern USGS map. There are several other surveys adjacent to the alignment (Arkush 1990, Clowery-Moreno and Smith 2007; Demack 2006; Hogan and Tang 2008b; Hunt *et al.* 2005; Smallwood and Shaker 2008).

NATIVE AMERICAN HERITAGE COMMISSION

The Native American Heritage Commission was contacted by Peak & Associates to request a review of its Sacred Lands File, and to provide the names of individuals and/or organizations in the area that may have knowledge concerning cultural resources in the project vicinity. This overview covered all of the recycled Water project, not just the currently proposed pipelines. Although resources on the sacred lands file were known to exist in the overall project area, there were none in the current project area (Appendix B).

CONCLUSIONS

The only recorded site in the project vicinity that has been evaluated by the recorder as eligible for the National Register of Historic Places is P-33-015743, the San Jacinto Valley Railroad. The only portion of the proposed project that gets near this site is in an area where the route of the San Jacinto Valley Railroad and the modern railroad are the same. Careful examination of detailed engineering plans shows that the proposed project will not affect the existing railroad, therefore, there will be no physical impact to P-33-015743. Because the proposed project is a buried pipeline, there will be no visual impact as well.

P-33-011233 is a small section of rock retaining wall along Winchester Road near the northern end of the French Valley project element. This was a minimal resource when recorded and, again, engineering plans do not call for a pipeline that would physically impact the site.

P-33-016991, the site of the former Alamos School, has virtually no evidence of the surface. It has never been tested for subsurface deposits, but it does not appear likely given the complete absence of surface artifacts. The site is located south of Benton Road, the pipeline route, and will not be impacted by the proposed construction.

The Reflection Lake RV Park (P-33-015741) is located south of the alignment of the San Jacinto project element and is not a significant resource in any event. It is currently in use and the lake was constructed by the Corps of Engineers between 1946 and 1953 (site record). The RV park was not established until 1968.

Based on the review of records maintained by the Eastern Information Center (Appendix A) and comparison with the details of the engineering plans, the project will have no effect on known historic properties.

RECOMMENDATIONS

There is always a possibility that previous activities (both natural and cultural) have obscured prehistoric or historic period artifacts or habitation areas, leaving no surface evidence to identify the resources. If, during construction activities, artifacts or non-native stone (obsidian, fine-grained silicates, basalt) are exposed or if unusual amounts of bone or shell are observed or if areas that contain dark-colored sediment that do not

appear to have been created through natural processes are discovered, then work should cease in the immediate area of the discovery and a professionally qualified archeologist should be contacted immediately for a on-site inspection of the discovery. If any bone is uncovered that appears to be human, then state law requires that the Riverside County Coroner must be contacted. If the coroner determines that the bone most likely represents a Native American interment, then he must contact the Native American Heritage Commission in Sacramento so that they can identify the most likely descendants.

In addition, the project proponent should maintain a dialog with the Native Americans that have been identified by the Native American Heritage Commission as organizations that may be concerned with the project, to insure that their interests are addressed.

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APPENDIX A

Information Center Correspondence

EASTERN INFORMATION CENTER

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM

Department of Anthropology, University of California, Riverside, CA 92521-0418

(951) 827-5745 - Fax (951) 827-5409 - eickw@ucr.edu

Inyo, Mono, and Riverside Counties

March 2, 2010
EIC-RIV-ST-811

Melinda A. Peak
Peak & Associates, Inc.
3941 Park Drive, Suite 20, #329
El Dorado Hills, CA 95762

Re: Cultural Resources Records Search for the EMWD Recycled Water Distribution Project

Dear Ms. Peak:

We received your request on February 25, 2010, for a cultural resources records search for the EMWD Recycled Water Distribution project located in Riverside County. We have reviewed our site records, maps, and manuscripts against the location maps you provided.

Project 1: located in sections 21, 22 and 27 of T.5S, R.1W, SBBM, in the Hemet area.

Our records indicate that five cultural resources studies have been conducted adjacent to your project area. Five additional studies provide overviews of cultural resources in the general project vicinity.

No cultural resources properties are recorded within the boundaries of the project area. Our records indicate that no properties have been recorded near the project area.

Projects 2, 3 and 4: located in multiple sections of T.5S, R.3W, SBBM, in the Romoland area.

Our records indicate that four cultural resources studies involved, and five are adjacent to, the project areas. One additional study provides an overview of cultural resources in the general project vicinities.

No cultural resources properties are recorded within the boundaries of the project areas. Our records indicate that one property is adjacent to one of the project areas (Project 2). 8196

Projects 5 and 6: located in sections 2, 3 and 4 of T.6S, R.3W, SBBM, in the Sun City area.

Our records indicate that six cultural resources studies involved, and four are adjacent to, the project areas. One additional study provides an overview of cultural resources in the general project vicinities.

No cultural resources properties are recorded within the boundaries of the project areas.

Project 7: located in multiple sections of T.6 and 7S, R.2W, SBBM, in the Bachelor Mountain area.

Our records indicate that four cultural resources studies involved, and six are adjacent to, the project area. One additional study provides an overview of cultural resources in the general project vicinity.

No cultural resources properties are recorded within the boundaries of the project area. Our records indicate that one property is adjacent the project area. 11233

Projects 8 and 9: located in sections 21, 22 and 27 of T.5S, R.1W, SBBM, in the March Air Force Base area.

Our records indicate that five cultural resources studies involved, and six are adjacent to, the project areas. Two additional studies provide overviews of cultural resources in the general project vicinities.

No cultural resources properties are recorded within the boundaries of the project areas.

Project 10: located in multiple sections of T.4S, R.1W, SBBM, in the Cottonwood Lake area.

Our records indicate that six cultural resources studies involve, and five are adjacent to, the project area. Five additional studies provide overviews of cultural resources in the general project vicinity.

No cultural resources properties are recorded within the boundaries of the project area. Our records indicate that one property is located adjacent the project area. 15741

Project 11: located in an unsectioned portion of T.4S, R.1W, SBBM, in the San Jacinto Reservoir area.

Our records indicate that one cultural resources study involves the project area.

No cultural resources properties are recorded within the boundaries of the project area.

All of these reports are listed on the attachment entitled "Eastern Information Center Report Listing" and are available upon request at 15¢/page plus $40/hour. Copies of the records are included for your reference.

The above information is reflected on the enclosed maps. Areas that have been surveyed are highlighted in yellow; slashes highlighted in yellow indicate a non-systematic survey. Numbers marked in blue ink refer to the report number (RI #). Cultural resources properties are marked in red; numbers in black refer to Trinomial designations, those in green to Primary Number designations. National Register properties are indicated in light blue.

Additional sources of information consulted are identified below.

National Register of Historic Places: no listed properties are located within the boundaries of the project area.

Office of Historic Preservation (OHP), Archaeological Determinations of Eligibility (ADOE): no listed properties are located within the boundaries of the project area.

Office of Historic Preservation (OHP), Historic Property Directory (HPD): no listed properties are located within the boundaries of the project area.

Note: not all properties in the California Historical Resources Information System are listed in the OHP ADOE and HPD; the ADOE and HPD comprise lists of properties submitted to the OHP for review.

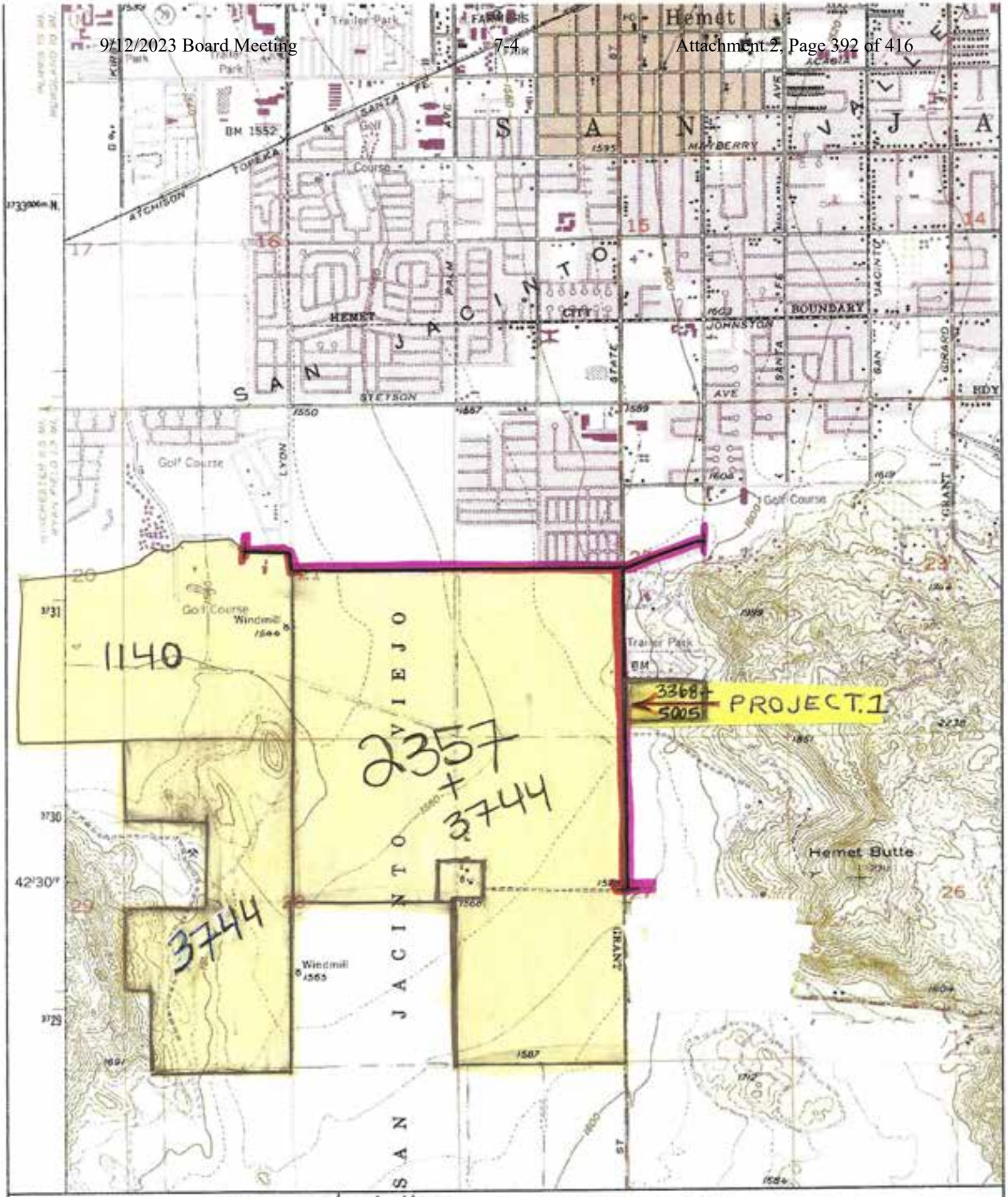
Copies of the relevant portions of the 1943 USGS Perris 15', the 1956 USGS Banning 15', the 1957 USGS Hemet 15', and the 1901 USGS Elsinore 30', topographic maps are included for your reference.

As the Information Center for Riverside County, it is necessary that we receive a copy of all cultural resources reports and site information pertaining to this county in order to maintain our map and manuscript files. Confidential information provided with this records search regarding the location of cultural resources outside the boundaries of your project area should not be included in reports addressing the project area.

Sincerely,

Lydia Hernandez
Information Officer

Enclosures



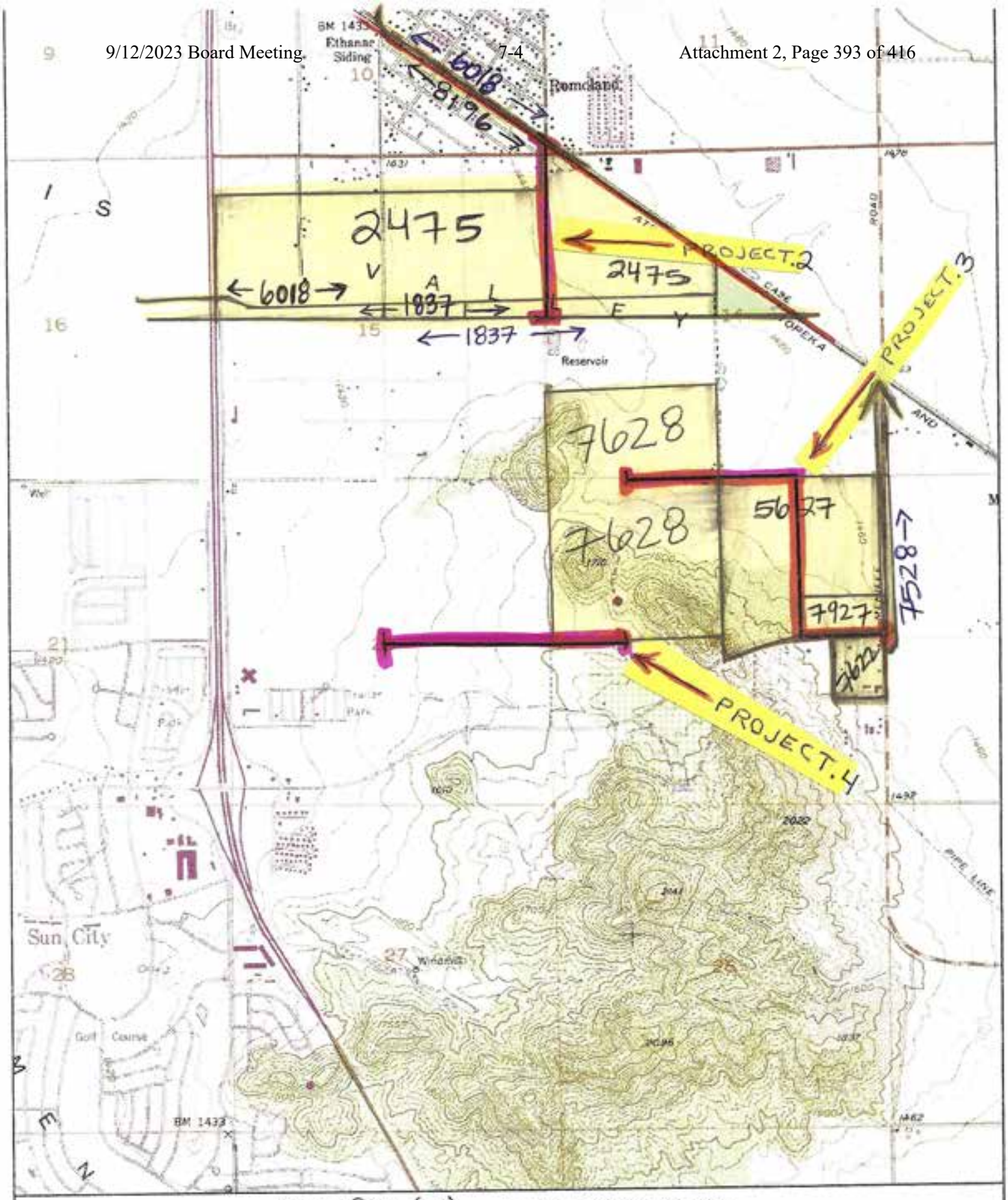
Name: HEMET
Date: 2/24/2010
Scale: 1 inch equals 2000 feet

Diamond Valley
Project.1

Location: 11 502137 E 3731024 N
Caption: Recycled Water Dist. Proj.
Diamond Valley

Overviews: RI-0002
RI-0027, RI-2344
RI-3490, RI-3687

Copyright (C) 1997, Maptech, Inc.



Name: ROMOLAND
Date: 2/24/2010
Scale: 1 inch equals 2000 feet

Menifee (N)
Projects. 2-4

Location: 11 483944 E 3731302 N
Caption: Recycled Water Dist. Proj.
Menifee (North)

Overview:
RI-0535

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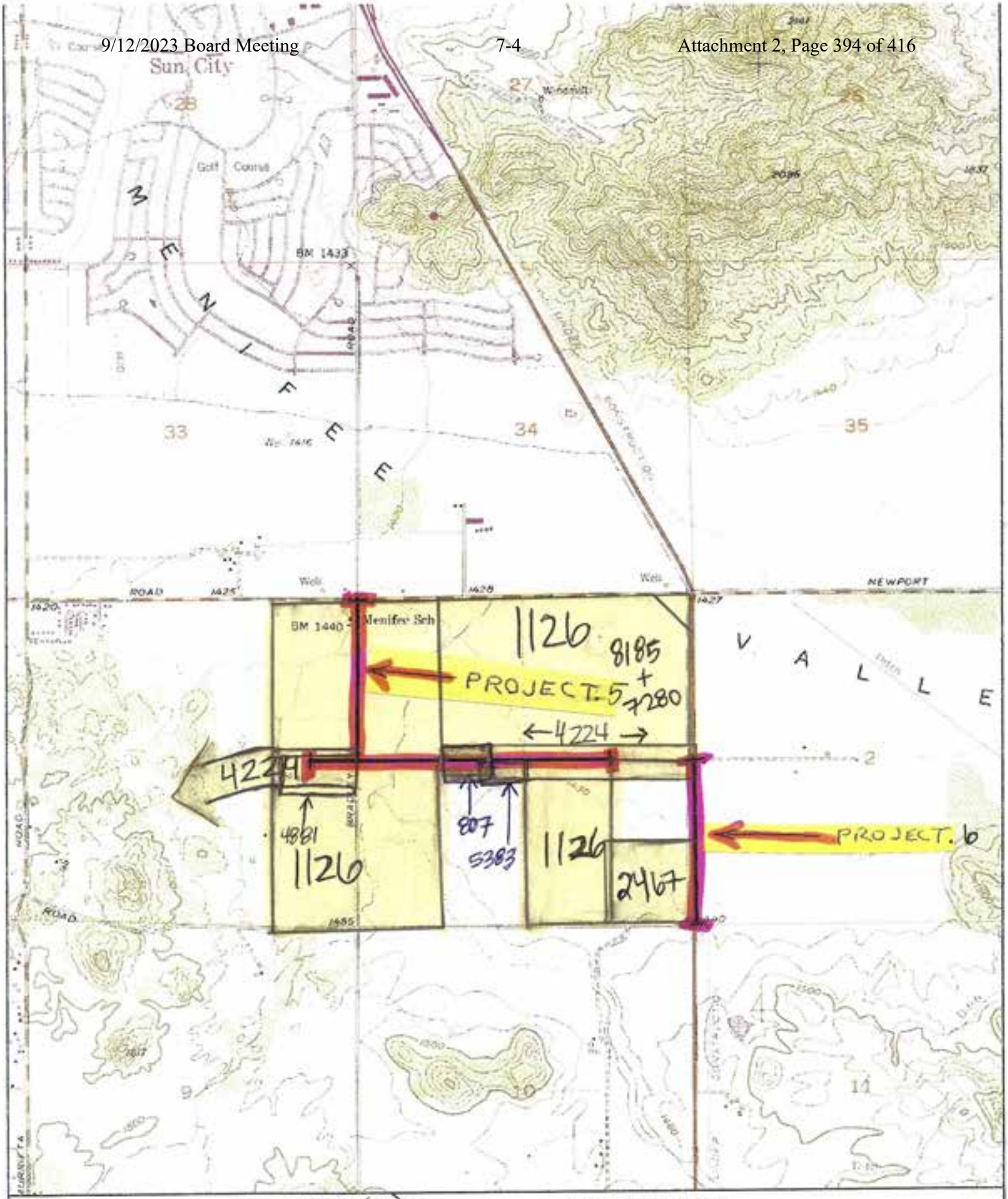

Name: ROMOLAND
Date: 2/24/2010
Scale: 1 inch equals 2000 feet

Menifee (S)
projects 5 & 6

Location: 11 483303 E 3727060 N
Caption: Recycled Water Dist Proj
Menifee (South)

Overview:
RI-0535

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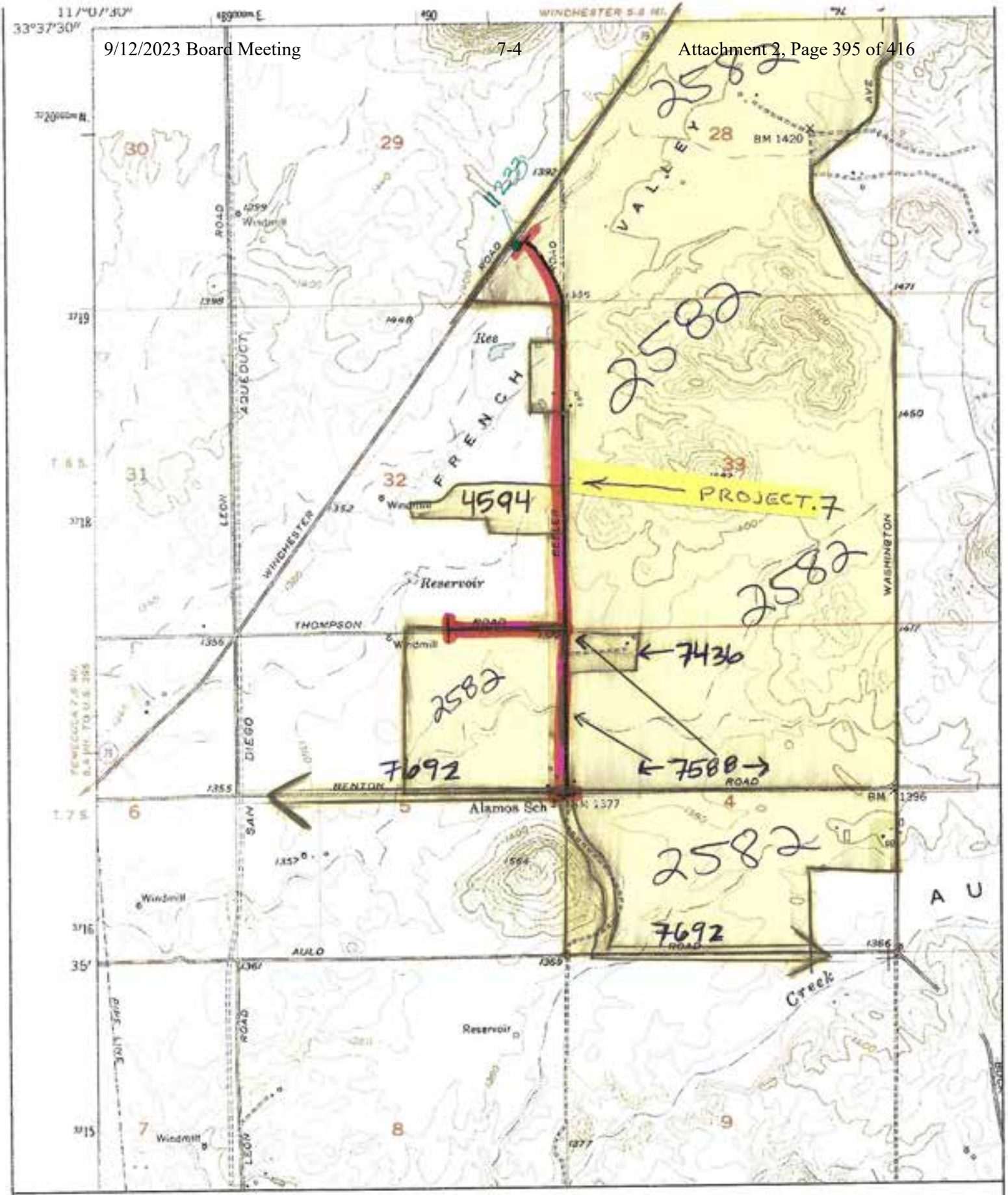

Name: BACHELOR MT
Date: 2/24/2010
Scale: 1 inch equals 2000 feet

French Valley
Project .7

Location: 11 490396 E 3717590 N
Caption: Bachelor Mountain
Recycled Water Dist
French Valley

Overview:
RI-0002

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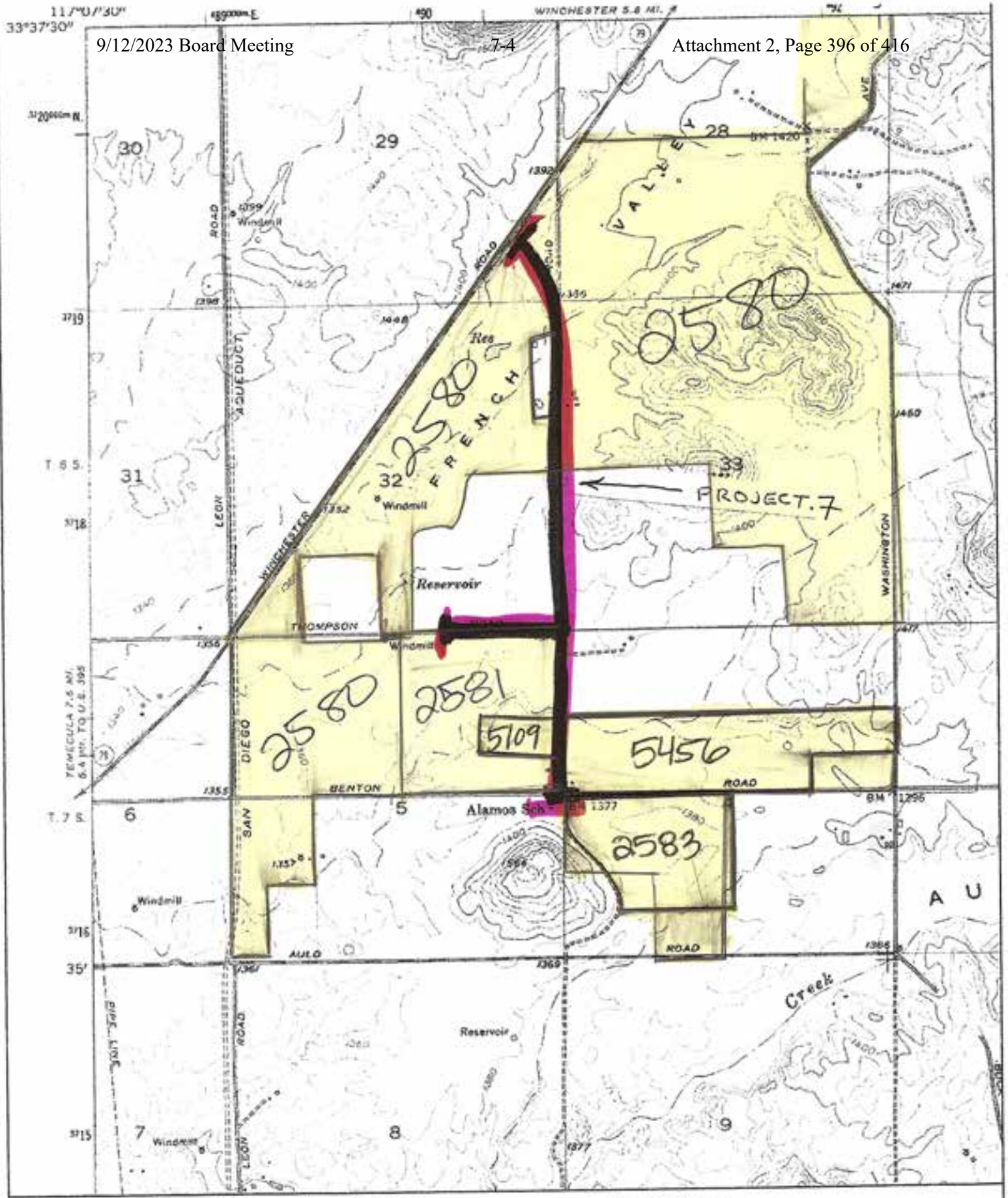

Name: BACHELOR MT French Valley
Date: 2/24/2010
Scale: 1 inch equals 2000 feet
Project .7

Location: 11 490396 E 3717590 N
Caption: Bachelor Mountain
Recycled Water Dist
French Valley

Overview:
R1-0002

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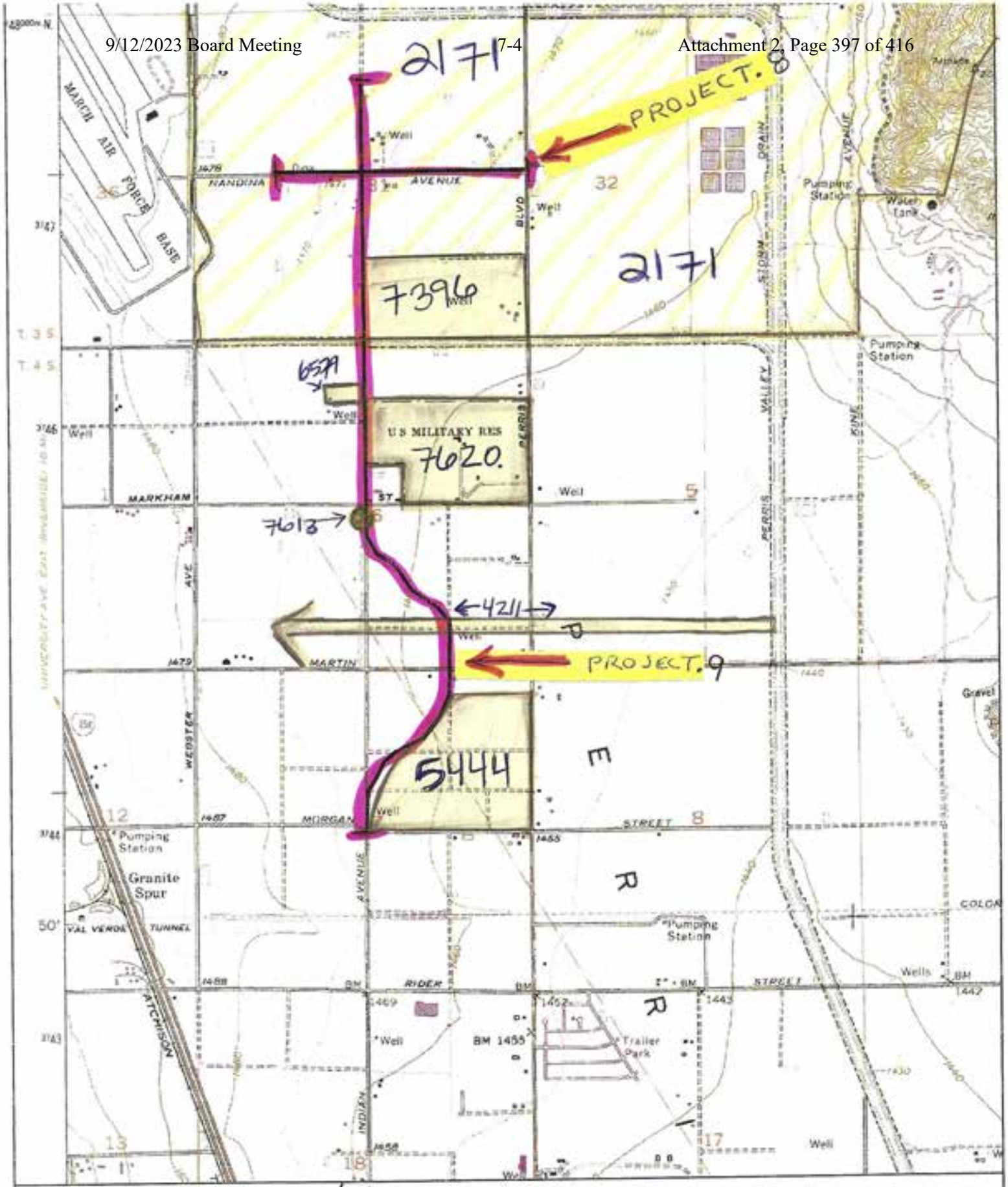

Name: PERRIS
Date: 2/24/2010
Scale: 1 inch equals 2000 feet

Perris Valley
Projects 8 & 9

Location: 11 479029 E 3745145 N
Caption: Recycled Water Dist. Proj.
Perris Valley

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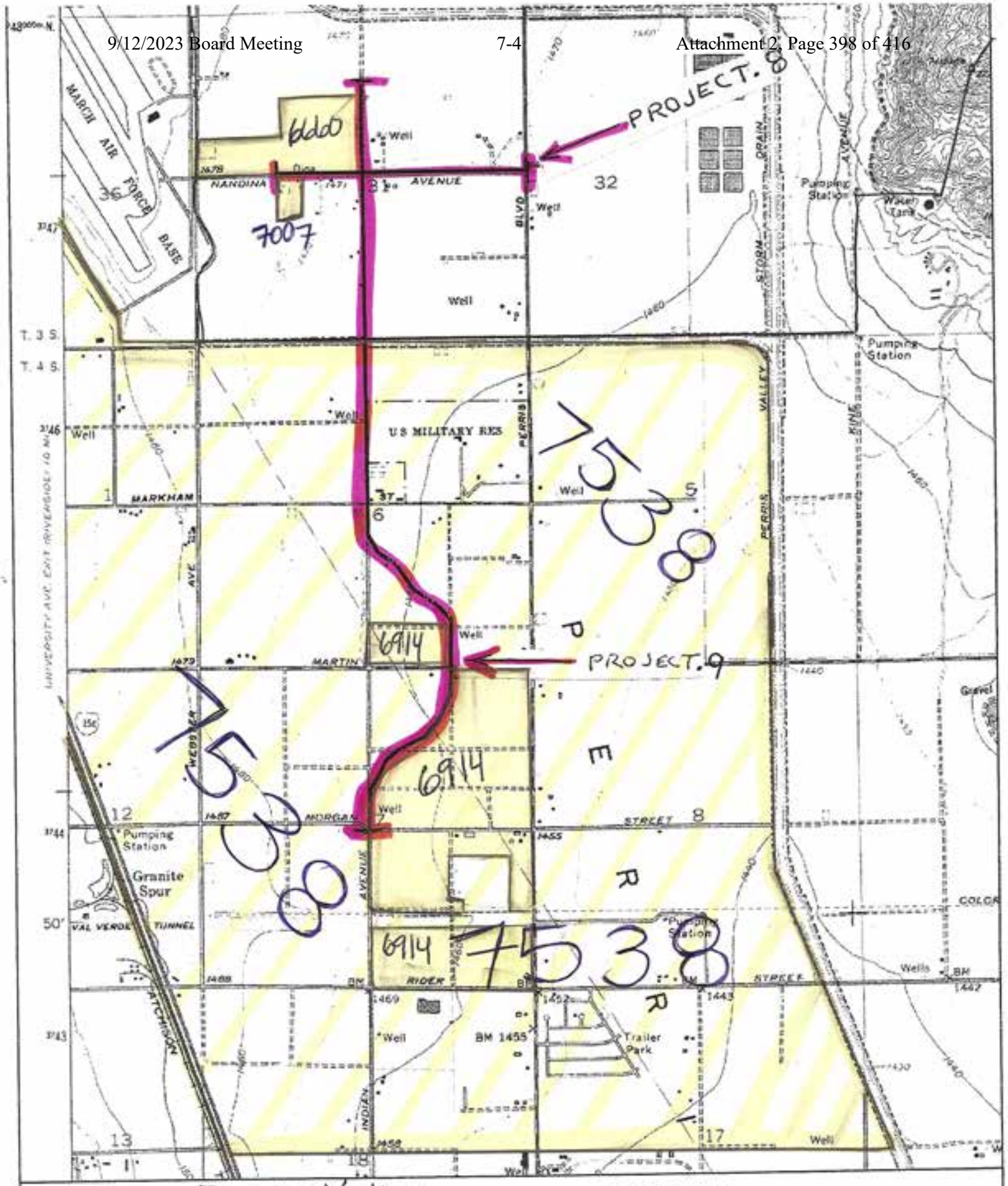
overviews:
R1-0535
R1-8235



Name: PERRIS
Date: 2/24/2010
Scale: 1 inch equals 2000 feet

Perris Valley
Projects 8 & 9

Location: 11 479029 E 3745145 N
Caption: Recycled Water Dist. Proj.
Perris Valley

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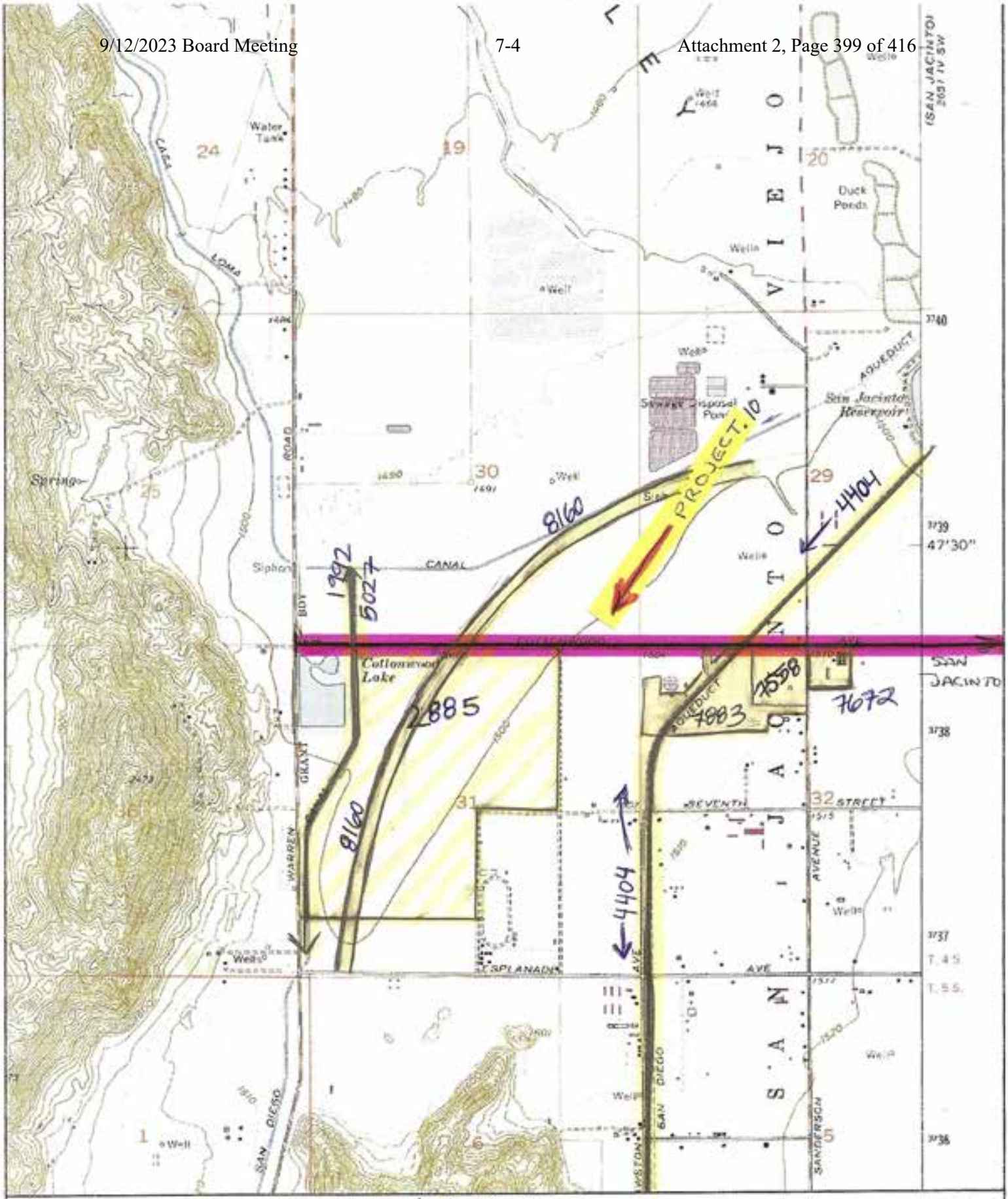
overviews:
R1-0535
R1-8235



Name: LAKEVIEW
Date: 2/24/2010
Scale: 1 inch equals 2000 feet

Hemet (W)
project. 10

Location: 11 497978 E 3738625 N
Caption: Recycled Water Dist. Proj.
Hemet (West)

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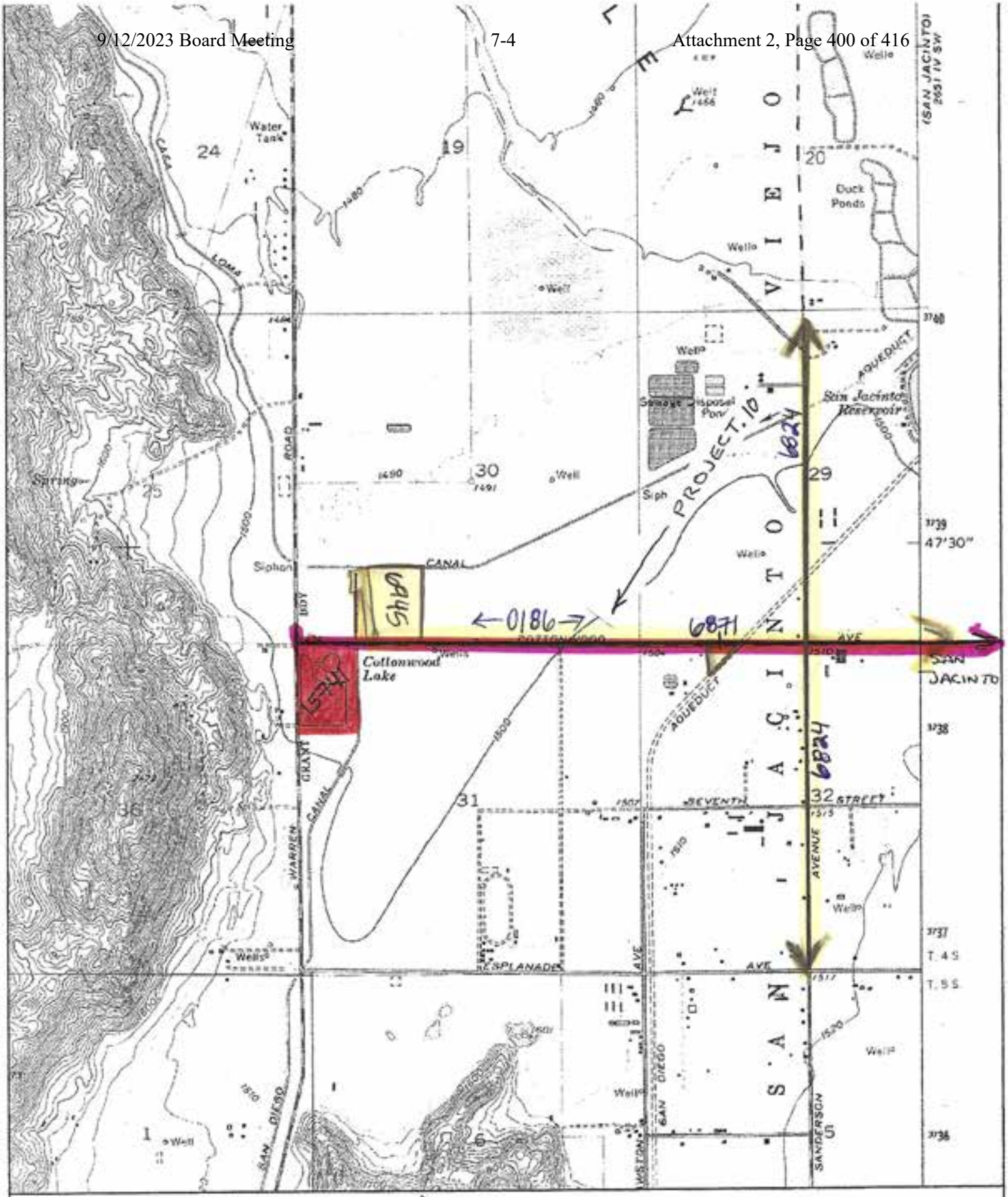
Overviews:
RI-8235, RI-0002
RI-0027, RI-3490
RI-5080



Name: LAKEVIEW
Date: 2/24/2010
Scale: 1 inch equals 2000 feet

Hemet (W)
project. 10

Location: 11 497978 E 3738625 N
Caption: Recycled Water Dist. Proj.
Hemet (West)

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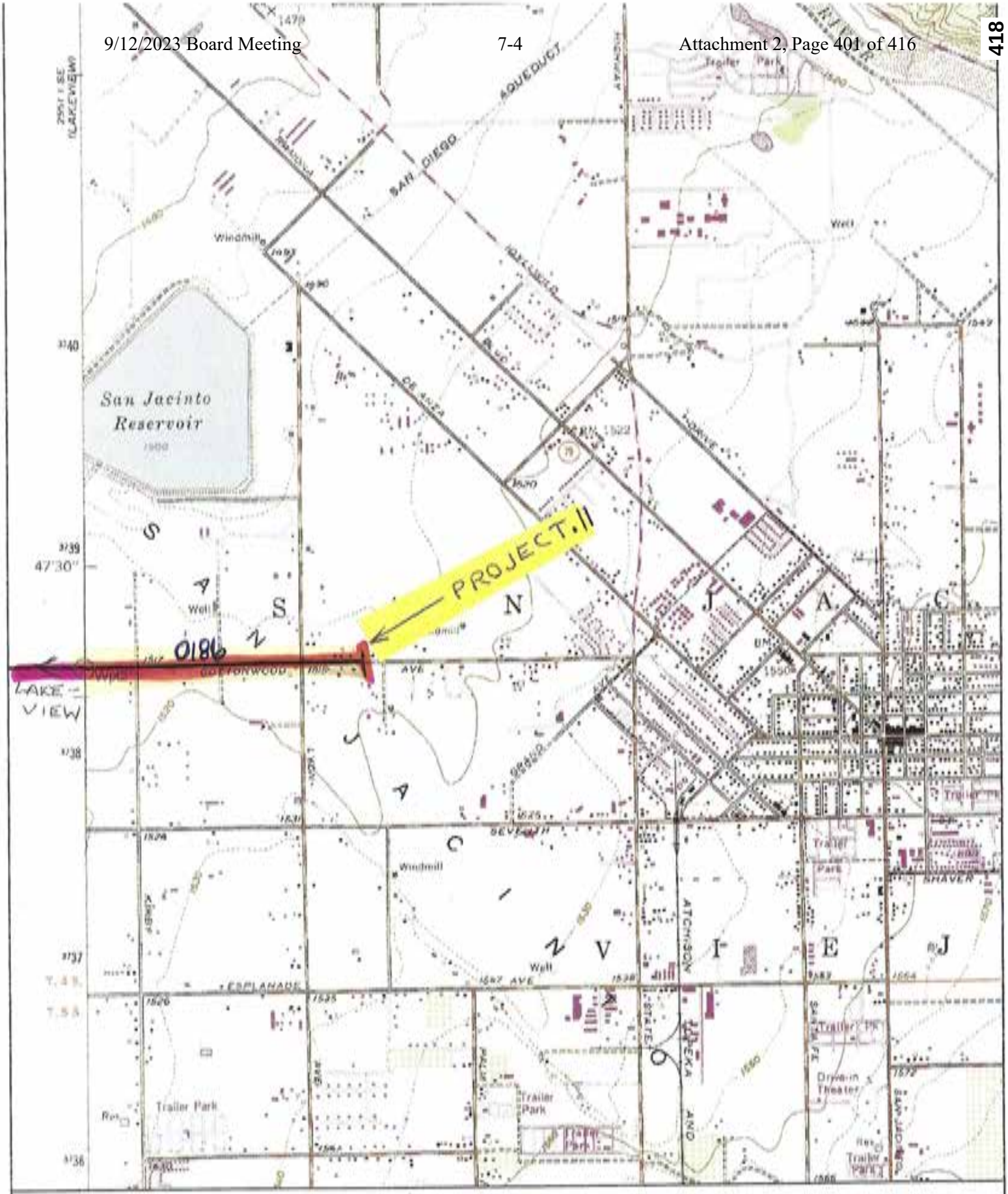
Overviews:
RI-8235, RI-0002
RI-0027, RI-3490
RI-5080



Name: SAN JACINTO
Date: 2/24/2010
Scale: 1 inch equals 2000 feet

Hemet (E)
Project.11

Location: 11 502041 E 3738732 N
Caption: Recycled Water Dist. Proj.
Hemet (East)

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EASTERN INFORMATION CENTER
CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM
Department of Anthropology, University of California, Riverside, CA 92521-0418
(951) 827-5745 - Fax (951) 827-5409 - eickw@ucr.edu
Inyo, Mono, and Riverside Counties

March 22, 2010
EIC-RIV-ST-811 Addendum

Melinda A. Peak
Peak & Associates, Inc.
3941 Park Drive, Suite 20, #329
El Dorado Hills, CA 95762

Re: Cultural Resources Records Search for the EMWD Recycled Water Distribution Project

Dear Ms. Peak:

We received your request on March 18, 2010, for an addendum cultural resources records search for the EMWD Recycled Water Distribution project located in sections 4 and 5 of T.7S, R.2W, SBBM, in the Auld Valley area of Riverside County. We have reviewed our site records, maps, and manuscripts against the location map you provided.

Our records indicate that three cultural resources studies involved, and four are adjacent to, the project area. One additional study provides an overview of cultural resources in the general project vicinities. All of these reports are listed on the attachment entitled "Eastern Information Center Report Listing" and are available upon request at 15¢/page plus $40/hour.

No cultural resources properties are recorded within the boundaries of the project area. Our records indicate that one property is adjacent to the project area. A copy of the record is included for your reference.

The above information is reflected on the enclosed maps. Areas that have been surveyed are highlighted in yellow. Numbers marked in blue ink refer to the report number (RI #). Cultural resources properties are marked in red; numbers in black refer to Trinomial designations, those in green to Primary Number designations. National Register properties are indicated in light blue.

Additional sources of information consulted are identified below.

National Register of Historic Places: no listed properties are located within the boundaries of the project area.

Office of Historic Preservation (OHP), Archaeological Determinations of Eligibility (ADOE): no listed properties are located within the boundaries of the project area.

Office of Historic Preservation (OHP), Historic Property Directory (HPD): no listed properties are located within the boundaries of the project area.

Note: not all properties in the California Historical Resources Information System are listed in the OHP ADOE and HPD; the ADOE and HPD comprise lists of properties submitted to the OHP for review.

A copy of the relevant portion of the 1901 USGS Elsinore 30' topographic map is included for your reference.

As the Information Center for Riverside County, it is necessary that we receive a copy of all cultural resources reports and site information pertaining to this county in order to maintain our map and manuscript files. Confidential information provided with this records search regarding the location of cultural resources outside the boundaries of your project area should not be included in reports addressing the project area.

Sincerely,

Lydia Hernandez
Information Officer

Enclosures

APPENDIX B

Native American Correspondence

Sacred Lands File & Native American Contacts List Request

NATIVE AMERICAN HERITAGE COMMISSION
915 Capitol Mall, RM 364
Sacramento, CA 95814
(916) 653-4082
(916) 657-5390 – Fax
nahc@pacbell.net

Information Below is Required for a Sacred Lands File Search

Project: Eastern Municipal Water District Recycled Water System

County: Riverside

USGS Quadrangle

Name: See attached table and maps

Township____ Range _____ Section(s) _____ See table

Company/Firm/Agency:
Peak & Associates, Inc.

Contact Person: Robert Gerry

Street Address: 3941 Park Drive, Suite 20, #329

City: El Dorado Hills, CA Zip: 95762

Phone: (916)939-2405

Fax: (916)939-2406

Email: peakinc@sbcglobal.net

Project Description:

A proposed recycled water system pressurization and expansion project involving six project elements, toataling about 19 miles of pipeline, in Riverside County.

STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
ds_nahc@pacbell.net

February 19, 2008

Mr. Robert Gerry
Peak & Associates, Inc.
3941 Park Drive, Suite 20 #329
El Dorado Hills, CA 95762

Sent by FAX to: 916-939-2405
Number of Pages: 3

Re: Request for a Sacred Lands File records search for the proposed Easter Municipal Water District Recycled Water System (Pressurization & Expansion) Project; located in the greater San Jacinto River Watershed/Valley; Riverside County, California

Dear Mr. Gerry:

The Native American Heritage Commission was able to perform a record search of its Sacred Lands File (SLF) for the affected project area (APE). The SLF search did indicate the presence of Native American cultural resources in the immediate project area.

Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries once a project is underway. Enclosed are the names of the nearest tribes that may have knowledge of cultural resources in the project area. In particular, we recommend that you contact Paul Macarro at (951) 308-9295, Extension 8106 and the other persons on the attached list of Native American contacts, may have knowledge as to whether or not the known cultural resources identified may be at-risk by the proposed project. The Commission makes no recommendation of a single individual or group over another. It is advisable to contact the person listed; if they cannot supply you with specific information about the impact on cultural resources, they may be able to refer you to another tribe or person knowledgeable of the cultural resources in or near the affected project area (APE).

Lack of surface evidence of archeological resources does not preclude the existence of archeological resources. In fact, a Native American tribe may be the only source of information about a cultural resource. Lead agencies should consider avoidance, as defined in Section 15370 of the California Environmental Quality Act (CEQA) when significant cultural resources could be affected by a project. Also, Public Resources Code Section 5097.98 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery. Discussion of these should be included in your environmental documents, as appropriate.

If you have any questions about this response to your request, please do not hesitate to contact me at (916) 653-6251.

Sincerely,

Dave Singleton
Program Analyst

Native American Contacts
Riverside County
February 19, 2008

Cahuilla Band of Indians
Anthony Madrigal, Jr., Chairperson
P.O. Box 391760 Cahuilla
Anza , CA 92539
tribalcouncil@cahuilla.net
(951) 763-2631

(951) 763-2632 Fax

Soboba Band of Mission Indians
Chairperson
P.O. Box 487 Luiseno
San Jacinto , CA 92581
varres@soboba-nsn.gov
(951) 654-2765
(951) 654-4198 - Fax

Los Coyotes Band of Mission Indians
Katherine Saubel, Spokesperson
P.O. Box 189 Cahuilla
Warner , CA 92086
loscoyotes@earthlink.net
(760) 782-0711
(760) 782-2701 - FAX

Alvino Siva
2034 W. Westward Cahuilla
Banning , CA 92220
(951) 849-3450

Pechanga Band of Mission Indians
Paul Macarro, Cultural Resource Center
P.O. Box 1477 Luiseno
Temecula , CA 92593
(951) 308-9295 Ext 8106
(951) 676-2768
(951) 506-9491 Fax

Santa Rosa Band of Mission Indians
John Marcus, Chairman
P.O. Box 609 Cahuilla
Hemet , CA 92546
srtribaloffice@aol.com
(951) 658-5311
(951) 658-6733 Fax

Ramona Band of Mission Indians
Joseph Hamilton, vice chairman
P.O. Box 391670 Cahuilla
Anza , CA 92539
admin@ramonatribe.com
(951) 763-4105
(951) 763-4325 Fax

Morongo Band of Mission Indians
Cultural Resources-Project Manager
49750 Seminole Drive Cahuilla
Cabazon , CA 92230 Serrano
britt_wilson@morongo.org
(951) 755-5206
(951) 755-5200/323-0822-cell
(951) 922-8146 Fax

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Eastern Municipal Water District Recycled Water System Project located in the San Jacinto River Watershed Area comprised of 941 acres and including several elements such as Storage Ponds, Pump Stations, Disposal Area. The Project is a Water System Pressurization and Expansion crossing several USGS Quadrangle Areas: Including Sunnymead, El Casco, Lakeview, Winchester, Hemet, San Jacinto and Romoland; Riverside County, California.

Appendix E

Mitigation Monitoring and Reporting Program

Mitigation Monitoring and Reporting Program
Recycled Water Distribution Pipeline Expansion Project

The California Environmental Quality Act (CEQA) requires that when a public agency completes an environmental document which includes measures to mitigate or avoid significant environmental effects, the public agency must adopt a reporting or monitoring program. This requirement ensures that environmental impacts found to be significant will be mitigated. The reporting or monitoring program must be designed to ensure compliance during project implementation (Public Resources Code Section 21081.6).

In compliance with Public Resources Code Section 21081.6, the following MITIGATION MONITORING AND REPORTING CHECKLIST has been prepared for the Recycled Water Distribution Pipeline Expansion Project. This Mitigation Monitoring and Reporting Checklist is intended to provide verification that all applicable Conditions of Approval relative to significant environmental impacts are monitored and reported. Monitoring will include: 1) verification that each mitigation measure has been implemented, 2) recordation of the actions taken to implement each mitigation, and 3) retention of records in the Recycled Water Distribution Pipeline Expansion Project file.

This Mitigation Monitoring and Reporting Program delineates responsibilities for monitoring the Project, but also allows Eastern Municipal Water District (EMWD) flexibility and discretion in determining how best to monitor implementation. Monitoring procedures will vary according to the type of mitigation measure. Adequate monitoring consists of demonstrating that monitoring procedures took place and that mitigation measures were implemented.

Reporting consists of establishing a record that a mitigation measure is being implemented and generally involves the following steps:

- EMWD distributes reporting forms to the appropriate persons for verification of compliance.
- Departments/agencies with reporting responsibilities will review the Environmental Impact Report, which provides general background information on the reasons for including specified mitigation measures.
- Problems or exceptions to compliance will be addressed to EMWD as appropriate.
- Periodic meetings may be held during project implementation to report on compliance of mitigation measures.
- Responsible parties provide EMWD with verification that monitoring has been conducted and ensure, as applicable, that mitigation measures have been implemented. Monitoring compliance

may be documented through existing review and approval programs such as field inspection reports and plan review.

- EMWD or Applicant prepares a reporting form periodically during the construction phase and an annual reporting summarizing all project mitigation monitoring efforts.

- Appropriate mitigation measures will be included in construction documents and/or conditions of permits/approvals.

Minor changes to the Mitigation Monitoring and Reporting Program, if required, would be made in accordance with CEQA and would be permitted after further review and approval by EMWD. Such changes could include reassignment of monitoring and reporting responsibilities, program redesign to make any appropriate improvements, and/or modification, substitution or deletion of mitigation measures subject to conditions described in CEQA Guidelines Section 15162. No change will be permitted unless the Mitigation Monitoring and Reporting Program continues to satisfy the requirements of Public Resources Code Section 21081.6.

Mitigation Monitoring and Reporting Program Checklist Recycled Water Distribution Pipeline Expansion Project

Mitigation Measure	Monitoring Process	Monitoring Timing	Responsible Person(s)	Date Completed
Air Quality				
EMWD will include the following mitigation measures in its standard construction specifications: ❖ Maintain construction equipment engines by keeping them properly tuned and maintained according to manufacturer's specifications. ❖ Use alternative fuels or clean and low-sulfur fuel for equipment. ❖ Do not idle diesel trucks onsite for more than 5 minutes at a time. ❖ Require construction equipment that meet or exceed Tier 3 emission standards and equip construction equipment with CARB verified oxidation catalysts and particulate traps. ❖ Spread soil binders on site, where appropriate, unpaved roads and staging areas. ❖ Water site and equipment every three hours during active construction periods. ❖ Sweep all streets at least once per day using SCAQMD Rule 1186 certified street sweepers or roadway washing trucks if visible soil materials are carried to adjacent streets. ❖ Suspend grading activities during first and second stage smog alerts and during high winds in accordance with SCAQMD Rule 403 requirements. ❖ If necessary, wash off trucks leaving the site. ❖ Cover haul trucks.	Site Inspection.	During Construction.	Field Engineering Inspector	By: _____ Date: _____

Mitigation Measure	Monitoring Process	Monitoring Timing	Responsible Person(s)	Date Completed
Cultural Resources				
Although no evidence of cultural resources was found at the project site, it is always possible that cultural resources could be unearthed during excavation. Therefore, EMWD will include the following mitigation measures in its standard construction specifications:				
❖ If inadvertent discoveries of cultural resources are encountered at any time during construction, construction personnel shall avoid altering these materials and their context until a qualified archeologist has evaluated the situation and contacted the State Office of Historic Preservation and the closest Indian Tribe to the Project. Project personnel shall not collect or retain cultural resources. Prehistoric resources include, but are not limited to: chert or obsidian flakes; projectile points; mortars and pestles; dark, friable soil containing shell and bone; dietary debris; heat-affected rock; or human burials. Historic resources include stone or adobe foundations or walls; structures and remains with square nails; and refuse deposits (glass, metal, wood, ceramics), often found in old wells and privies.	Site Inspection.	During Excavation.	Field Engineering Inspector	By: _____ Date: _____
❖ If paleontological resources (e.g., fossils) are encountered at any time during construction of the project, construction personnel shall avoid altering these materials and their context until a qualified paleontologist has evaluated the situation. Project personnel shall not collect or retain paleontological resources.	Site Inspection.	During Excavation.	Field Engineering Inspector	By: _____ Date: _____
❖ In the event of an accidental discovery or recognition of any human remains, the County Coroner shall be notified and construction activities at the affected work site shall be halted. If the remains are found to be Native American, the Native American Heritage Commission shall be notified within 24 hours. The NAHC must identify a Most Likely Descendant(s) under Public Resources Code §5097.98 within 48 hours of receiving such notification. Guidelines of the Native American Heritage Commission shall be adhered to in the treatment and disposition of the remains in accordance with the provisions of Health and Safety Code §7050.5 and Public Resources Code §5097.98.	Site Inspection.	During Excavation.	Field Engineering Inspector	By: _____ Date: _____
Hazards and Hazardous Materials				
To reduce potentially hazardous conditions and minimize the impacts from the handling of potentially hazardous materials, EMWD will include the				

Mitigation Measure	Monitoring Process	Monitoring Timing	Responsible Person(s)	Date Completed
following in its construction contract documents:				
❖ The contractor(s) shall enforce strict on-site handling rules to keep construction and maintenance materials out of receiving waters and storm drains. In addition, the contractor(s) shall store all reserve fuel supplies only within the confines of a designated construction staging area, refuel equipment only within the designated construction staging area, and regularly inspect all construction equipment for leaks.	Site Inspection.	During Construction.	Field Engineering Inspector.	By: _____ Date: _____
❖ The contractor(s) shall prepare a *Health and Safety Plan* in compliance with the requirements of Chapter 6.95, Division 20 of the Health and Safety Code (§§ 25500—25532). The plan shall include measures to be taken in the event of an accidental spill.	Site Inspection.	During Construction.	Field Engineering Inspector.	By: _____ Date: _____
❖ The construction staging area shall be designed to contain contaminants such as oil, grease, and fuel products so that they do not drain towards receiving waters or storm drain inlets.	Site Inspection.	During Construction.	Field Engineering Inspector.	By: _____ Date: _____
Hydrology and Water Quality				
EMWD will require contractors to implement a program of best management practices (BMP's) and best available technologies to reduce potential impacts to water quality that may result from construction activities. To reduce or eliminate construction-related water quality impacts before the onset of construction activities, EMWD should obtain coverage under the National Pollutant Discharge Elimination System (NPDES) General Construction Permit. Construction activities shall comply with the conditions of this permit that include preparation of a stormwater pollution prevention plan, implementation of BMP's, and monitoring to insure impacts to water quality are minimized. As part of this process, multiple BMP's should be implemented to provide effective erosion and sediment control. These BMP's should be selected to achieve maximum sediment removal and represent the best available technology that is economically achievable. BMP's to be implemented as part of this mitigation measure should include, but not be limited to, the following:				

Mitigation Measure	Monitoring Process	Monitoring Timing	Responsible Person(s)	Date Completed
❖ Temporary erosion control measures such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other groundcover shall be employed for disturbed areas.	Site Inspection.	During Construction.	Field Engineering Staff.	By: _____ Date: _____
❖ Storm drain inlets on the site and in downstream offsite areas shall be protected from sediment with the use of BMP's acceptable to EMWD, local jurisdictions and the California Regional Water Quality Control Board, Santa Ana or San Diego Regions.	Site Inspection.	During Construction.	Field Engineering Staff.	By: _____ Date: _____
❖ Dirt and debris shall be swept from paved streets in the construction zone on a regular basis, particularly before predicted rainfall events.	Site Inspection.	During Construction.	Field Engineering Staff.	By: _____ Date: _____
❖ No disturbed surfaces shall be left without erosion control measures in place between October 15 and April 15. EMWD shall file a Notice of Intent with the Regional Board and require the preparation of a pollution prevention plan prior to commencement of construction. EMWD shall routinely inspect the construction site to verify that the BMP's specified in the pollution prevention plan are properly installed and maintained. EMWD shall immediately notify the contractor if there were a noncompliance issue and require immediate compliance.	Site Inspection.	During Construction.	Field Engineering Staff.	By: _____ Date: _____
❖ Controls on construction site dewatering shall be implemented. If possible, water generated as part of construction dewatering shall be discharged onsite such that there would be no discharge to surface waters. If discharge to surface waters were unavoidable, EMWD shall obtain coverage under the NPDES General Dewatering Permit prior to commencement of construction. The provisions of this permit are sufficiently protective of water quality to ensure that impacts to surface waters would remain below significance thresholds. During dewatering activities, all permit conditions shall be followed. EMWD shall routinely inspect the construction site to verify that the measures specified in the permit are properly implemented. EMWD shall immediately notify the contractor if there were a noncompliance issue and require immediate compliance.	Site Inspection.	During Construction.	Field Engineering Staff.	By: _____ Date: _____
Noise				
EMWD will include the following in its standard construction specifications:				

Mitigation Measure	Monitoring Process	Monitoring Timing	Responsible Person(s)	Date Completed
❖ Construction activities shall be limited to between the hours of 7:00 am and 7:00 pm and as necessary to comply with local ordinances. Any holiday, nighttime or weekend construction activities shall be subject to local permitting requirements.	Site Inspection.	During Construction.	Field Engineering Inspector.	By: _____ Date: _____
❖ All equipment used during construction shall be muffled and maintained in good operating condition. All internal combustion engines shall be fitted with well maintained mufflers in accordance with manufacturers' recommendations.	Site Inspection.	During Construction.	Field Engineering Inspector.	By: _____ Date: _____
❖ The contractor shall contact each school prior to conducting work adjacent to the school grounds.	Project Records.	During Construction.	Project Engineer.	By: _____ Date: _____
Transportation/Traffic				
The following mitigation measures will be complied with to reduce the transportation/traffic impacts to a level of less than significant:				
❖ Traffic control plans shall be prepared by a qualified professional engineer prior to construction.	Plan Review.	Prior to Construction.	Project Engineer.	By: _____ Date: _____
❖ Traffic control plans shall consider the ability of alternative routes to carry additional traffic and identify the least disruptive hours of construction site truck access routes and the type and location of warning signs, lights and other traffic control devices. Consideration shall be given to maintaining access to commercial parking lots, private driveways and sidewalks, bikeways and equestrian traffic to the greatest extent possible.				
❖ Traffic control plans shall comply with Part 6 of the California Manual on Traffic Control Devices as determined by the affected local agencies to minimize any traffic and pedestrian hazards that exist during project construction.				
❖ Encroachment permits for all work within public rights-of-way shall be obtained from each affected agency prior to commencement of any construction. EMWD shall comply with all traffic control requirements of the local agencies.	Permit Review.	Prior to Construction.	Project Engineer.	By: _____ Date: _____

Mitigation Measure	Monitoring Process	Monitoring Timing	Responsible Person(s)	Date Completed
❖ Public streets shall be kept operational during construction, particularly during the morning and evening peak hours of traffic. Lane closures shall be minimized during peak traffic hours.	Field Inspection.	During Construction.	Field Engineering Inspector.	By: _____ Date: _____
❖ Public streets shall be restored to a condition mutually agreed to between EMWD and the appropriate local agencies prior to construction.	Field Inspection.	During Construction.	Field Engineering Inspector.	By: _____ Date: _____
❖ Emergency service providers shall be contacted and consulted to preclude the creation of unnecessary traffic bottlenecks that would seriously impede response times. Additionally, measures to provide an adequate level of access to private properties shall be maintained to allow delivery of emergency services.	Field Inspection.	During Construction.	Field Engineering Inspector.	By: _____ Date: _____

ADDENDUM TO EA/EIR FOR THE FOR THE RECYCLED WATER DISTRIBUTION PIPELINE EXPANSION PROJECT

Prepared by
Eastern Municipal Water District
2270 Trumble Road
Perris, CA 92572

1. INTRODUCTION:

The Recycled Water Distribution Pipeline Expansion Project (hereinafter referred to as "Approved Project") was evaluated in the Recycled Water Distribution Pipeline Expansion Project Environmental Assessment/Program Environmental Impact Report (hereinafter referred to as "2010 EA/EIR"). The EA/EIR was certified by the Eastern Municipal Water District (hereinafter referred to as "District" or "EMWD") on September 22, 2010. The 2010 EA/EIR analyzed the construction of approximately 89,405 linear feet (lf) of recycled water pipeline varying in size from 8-inch diameter up to 24-inch diameter within various public street rights-of-way (ROW) in five geographic locations. This distribution pipeline was intended to provide an immediate reduction of approximately 2,000 acre-feet (af) of annual potable water demand while helping to support an additional 5,300 af of landscape irrigation demand from new development in the District service area.

2. PROJECT MODIFICATION DESCRIPTION:

Since the approval of the original project (as described in Section 1 of this addendum), a minor project modification has occurred that needs to be addressed within the context of CEQA and the State CEQA Guidelines. Eastern Municipal Water District (District) is proposing to obtain financial assistance for the approved project through the Local Resources Program (LRP) that is administered by The Metropolitan Water District of Southern California (Metropolitan). The LRP provides financial incentives to public and private water agencies to encourage local development of water recycling, groundwater recovery and seawater desalination.

Metropolitan offers three different LRP incentive payment structure alternatives to choose from:

Alternative 1: Sliding scale incentives, recalculated annually based on eligible project costs incurred each year and Metropolitan's applicable water rates, up to $340/AF over 25 years;

Alternative 2: Sliding scale incentives up to $475/AF over 15 years; and

Alternative 3: Fixed incentive up to $305/AF over 25 years.

The District has chosen the Alternative 3.

As the Lead Agency, Eastern Municipal Water District has prepared this addendum to the previously certified EIR in support of its discretionary action to comply with CEQA and the State CEQA Guidelines. For this proposed project modification, Metropolitan will act as a Responsible Agency.

3. Minor Technical Additions

This addendum has been prepared since partnering in the original project would require a discretionary action by the Lead Agency's decision making body.

On October 20, 2022, the Eastern Municipal Water District submitted the proposal on the Recycled Water Distribution Pipeline Expansion Project to Metropolitan. As the Responsible Agency, Metropolitan's Board of Directors will review and consider the proposal and environmental documentation prepared by Eastern Municipal Water District in determining whether or not to approve financial assistance for the project within the LRP administrative process.

The proposed project modification (i.e., a partnership with Metropolitan in the LRP for the Recycled Water Distribution Pipeline Expansion Project would be consistent with Metropolitan's commitment to develop LRP activities that would increase water supply reliability and avoid or defer Metropolitan capital expenditures.

Therefore, this minor technical change and further clarification to the original project has no impact on water supplies or water quality within the Lead Agency's service area. Instead, the proposed project modification is an administrative and fiscal action.

4. Basis for Preparation of Addendum:

Section 15164(a) of the State CEQA Guidelines states, "The lead agency or a responsible agency shall prepare an addendum to a previously certified EIR if some changes or additions are necessary but none of the conditions described in Section 15162 calling for preparation of a subsequent EIR have occurred."

	7/19/2023
Signature	Date
Alfred Javier	Dir. of Env. & Reg. Compliance
Printed Name	Title

One Water and Stewardship Committee

Authorize entering into a Local Resources Program Agreement with Eastern Municipal Water District for the French Valley Recycled Water Distribution Project

Item 7-4

September 11, 2023

Local Resources Program

Purpose

Provides incentives for Metropolitan's member agencies to develop new local projects to increase water supply reliability in the region

Recycled Water (1982)

Groundwater Recovery (1991)

Seawater Desalination (2014)

Local Resources Program

Benefits

Increases regional water supply reliability

Reduces demand for imported water supplies

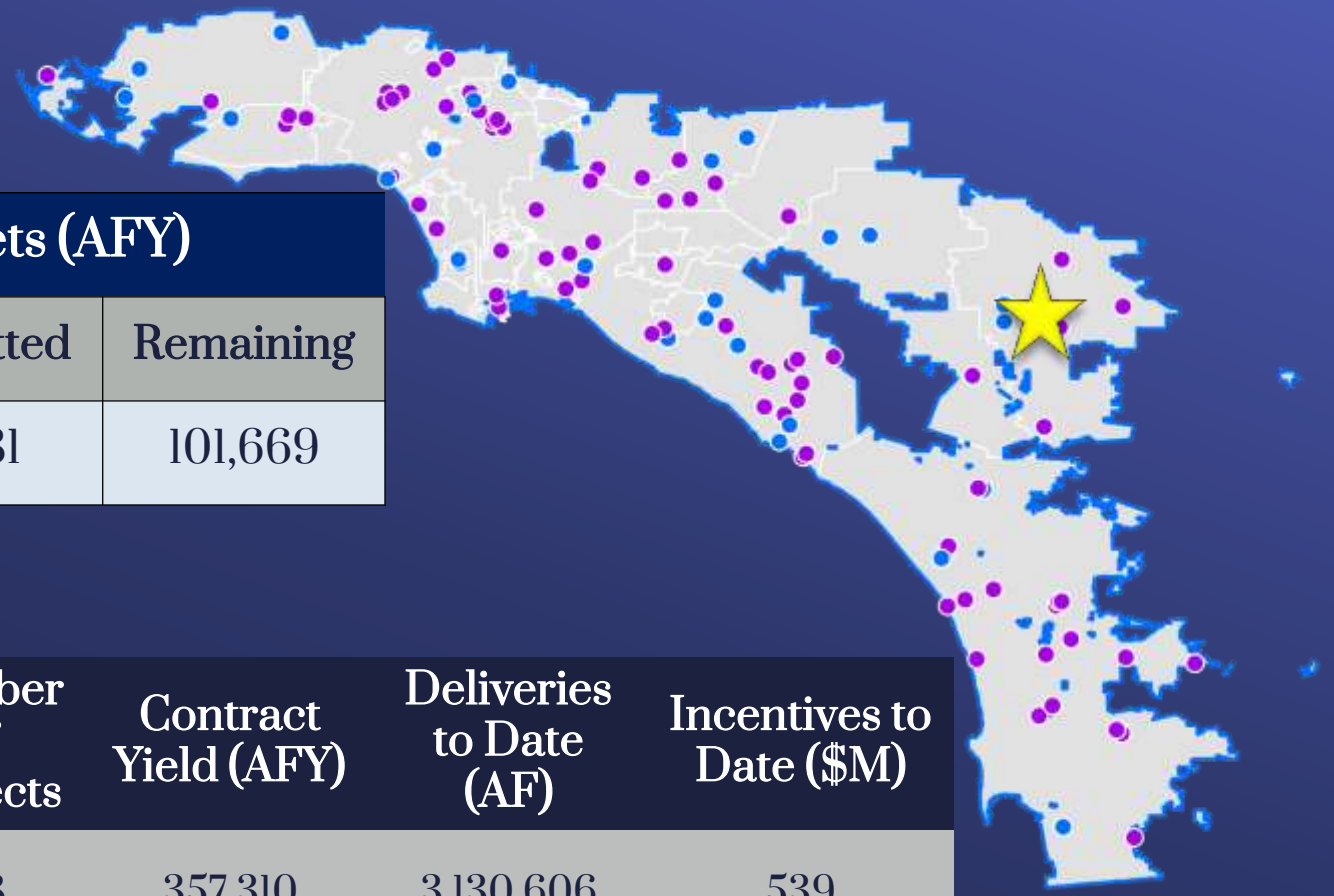
Legislative Mandate (SB 60 - 1999)

Decreases the burden on Metropolitan's infrastructure

Local Resources Program

Summary To-Date

LRP Targets (AFY)		
Target	Committed	Remaining
170,000	68,331	101,669



Type	Number of Projects	Contract Yield (AFY)	Deliveries to Date (AF)	Incentives to Date ($M)
Recycling	88	357,310	3,130,606	539
Groundwater Recovery	28	124,744	1,188,400	194
Total	**116**	**482,055**	**4,319,006**	**733**

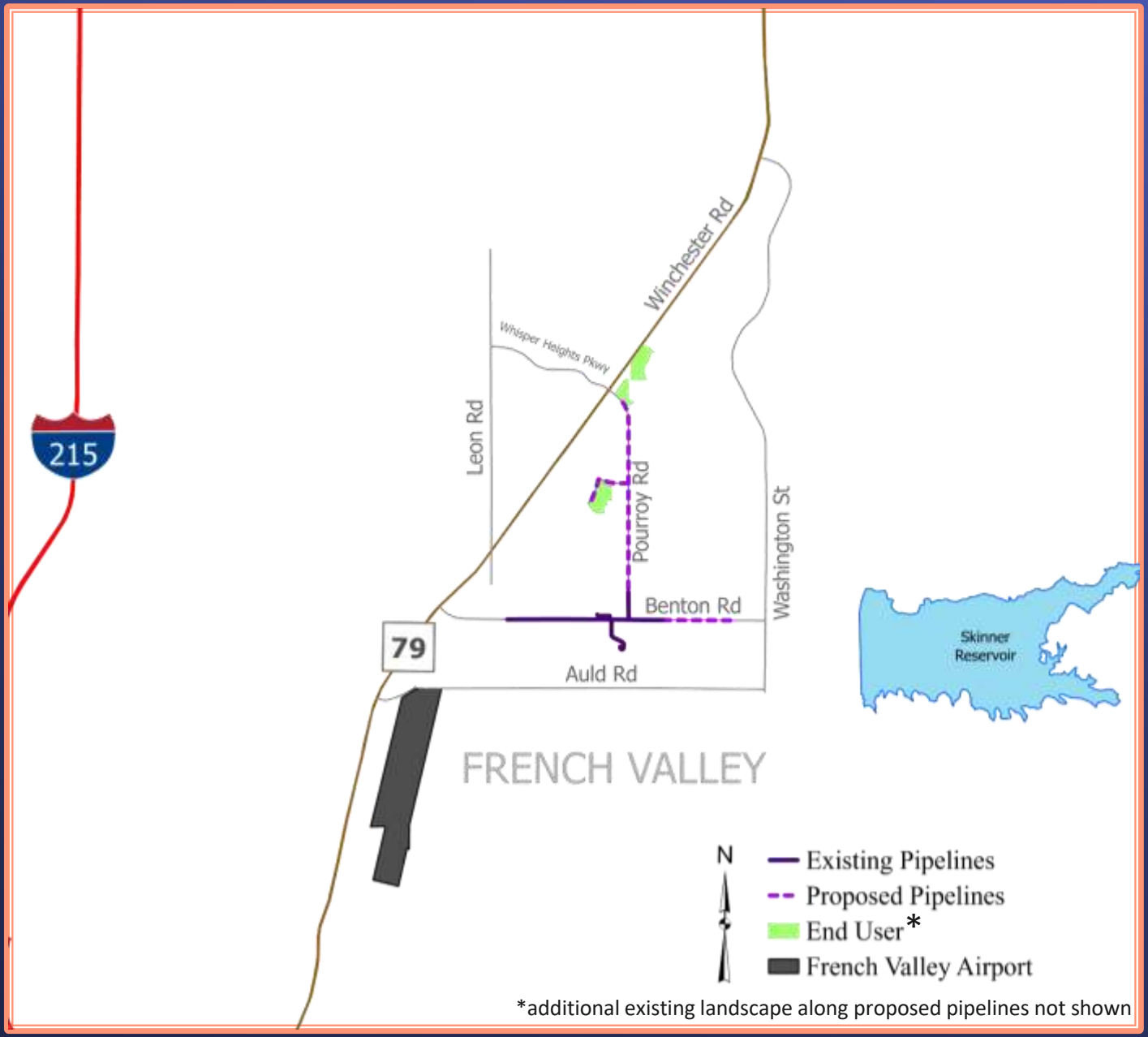
Incentive Payment Structures

Payment Structure Alternatives	Maximum* Incentive Amount	Payment Period
1 – Sliding Scale	$340/AF	25 years
2 – Sliding Scale**	$475/AF	15 years
3 – Fixed Incentive Rate	$305/AF	25 years

* Pay for project water used. Incentives never exceed costs.
** Project must produce for 25 years

French Valley Recycled Water Distribution Project

Location Map



French Valley Recycled Water Distribution Project

Description

- Expansion of recycled water distribution system
  - 12,300 linear feet of transmission pipeline
  - Delivery of tertiary treated recycled water supplied by the existing Temecula Valley Regional Water Reclamation Plant
- Eastern will own and operate the Project and plans to deliver water by 2024

French Valley Recycled Water Distribution Project

Agreement Terms

140 AFY over 25 years

Fixed incentives up to $305/AF for 25 years

$ 1.07 million maximum lifetime contract payment

3,500 AF maximum contract yield over 25 years

Performance Provisions

- Start of construction and operation
- Production required over 25 years
- Production targets every four years

Board Options

- Option #1
  - Review and consider Eastern Municipal Water District's certified Final Environmental Impact Report and Addendum, and take related CEQA actions;
  - Authorize the General Manager to enter into a Local Resources Program Agreement with Eastern Municipal Water District for the French Valley Recycled Water Distribution Project for up to 140 AFY of recycled water for irrigation use in the Eastern Municipal Water District service area
- Option #2

  Do not authorize execution of an agreement for the Project.

Staff Recommendation

- Option #1

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

BOARD ACTION

- **Board of Directors**
  One Water and Stewardship Committee

9/12/2023 Board Meeting

8-2

Subject

Authorize payments, by a two-thirds vote, of up to $4.16 million for participation in the State Water Contractors for FY 2023/24; the General Manager has determined the proposed action is exempt or otherwise not subject to CEQA

Executive Summary

This action requests authorization to continue funding and participation in the State Water Contractors (SWC). Participation in this organization allows Metropolitan to advocate for effective operations and management of the State Water Project (SWP), with an emphasis on the reliability of the SWP infrastructure, managing electrical power resources, and the Sacramento-San Joaquin Bay/Delta (Delta). Metropolitan's participation enhances the effectiveness of relationships with the other SWP contractors. The SWC provides a unified voice among the contractors to provide input to the California Department of Water Resources (DWR) on the management of the SWP. The SWC's main focus areas include responding to climate change, meeting renewable energy goals, advancing science for decision-making in the Delta, and collaborating with stakeholders to reach mutually beneficial solutions such as the Voluntary Agreements.

This authorization requests up to $4.16 million, two percent more than budgeted. Any overage will be managed within the Water Resource Management Group's overall budget. With this participation, Metropolitan will also leverage approximately $5.1 million in funding from other SWP contractors.

Details

Background

State Water Contractors

The SWC is a nonprofit association of 27 public agencies from northern, central, and southern California with contracts providing participation rights in the SWP. Collectively, there are 27 million Californians (which is one in 12 Americans) and 750,000 acres of productive farmland in the SWC members' service areas. The SWC's role and activities provide input into DWR's policy and decision-making process. The SWC effectively represents the interests of Metropolitan and the other contractors in discussions with DWR and through interactions with other state, federal, and local entities.

At the August meeting of the One Water and Stewardship Committee, the SWC General Manager, Jennifer Pierre, provided an overview of the purpose, activities, and benefits of the SWC. She described how the SWC advocated on behalf of its members for improved supply reliability and water quality based on sensible, science-based policies. These activities result in a more sustainable and cost-effective SWP.

The SWC's limited staff of nine employees coordinates across the SWC to ensure consistent policy positions, effective messaging, and coordinated advocacy. This coordination first seeks unanimity whenever possible and then amplifies the individual agency voices before DWR, the Newsom administration, the State Legislature, and the many regulatory agencies who hold responsibilities in the Delta.

The SWC's work efforts and associated revenue collections include five areas:

1. **Dues Fund** – Funds SWC activities supporting DWR cost management, infrastructure repair and replacement, water supply reliability, and water quality. This fund also includes general operating expenses.
2. **Energy Fund** – Funds SWC activities to help DWR develop and implement energy strategies to meet state mandates while obtaining cost-effective energy for the SWP.
3. **Bay-Delta Fund** – Supports SWC participation in Delta fish monitoring, environmental reviews, coordination with the Central Valley Project, protection of existing operations, advancing science, and planning for a changed climate now and in the future. Because some Metropolitan staff efforts closely align with and support the SWC, Metropolitan receives a discount of 45 percent (approximately $560,000) (excluding SWC legal fees).
4. **Delta Conveyance Project Fund** – Supports SWC involvement in the Delta Conveyance Project planning activities, such as assisting with permits, environmental documentation, and policy and technical support to determine project benefits.
5. **Municipal Water Quality Investigations (MWQI)**– Provides SWP contractors with water quality information related to drinking water regulations through specialized scientific studies, research, and investigations.

The united voice of the SWC provides value in achieving favorable outcomes. Notable accomplishments of direct value to Metropolitan include:

(1) Coordination with the SWP Chief Financial Manager to advocate for appropriate financial controls and compliance with generally accepted financial standards,

(2) Implementation of the 50-year SWP Contract extension, which began in January 2023,

(3) Advocacy for amendments to Senate Bill 1020, which affirmed the commitment of DWR to secure 100 percent renewable or zero-carbon resources on a modestly extended schedule to save the SWP billions of dollars in energy costs,

(4) Pursuit of infrastructure solutions for the SWP, such as storage investigations, subsidence mitigation, and appropriate cost-sharing of the seismic retrofit of San Luis Reservoir's Sisk Dam.

Further accomplishments are provided in **Attachment 1**, and **Attachment 2** describes SWC objectives for FY 2023/24.

Summary of Payment Distribution

The table below summarizes the current and proposed costs for participation in the SWC:

SWC Payments

	FY 2023/24 SWC Budget	**FY 2022/23 SWC Actual**
Dues Fund	$ 2,068,251	$ 1,698,105
Energy Fund	$ 289,245	$ 234,971
Bay-Delta Fund	$ 1,086,399	$ 1,108,684
Delta Conveyance Project Fund	$ 454,227	$ 449,955
MWQI	$ 260,000	$ 260,000
Total:	**$ 4,158,122**	**$ 3,751,715**

Metropolitan's payment to the SWC for FY 2023/24 is approximately $92,000 above budget. The primary driver of this increase is in the Dues Fund, which is charged to the contractors based on deliveries of SWP supplies in the prior year. In calendar year 2022, Metropolitan's use of Human Health and Safety supplies increased its proportionate take compared to other contractors.

The MWQI Specific Project Committee is preparing its calendar year 2024 activities and budget for approval in December 2023. Once approved, Metropolitan will pay its share of costs. Staff requests authorization to pay up to $260,000 for funding the Committee. This amount is consistent with the FY 2023/24 budget.

Alternatives Considered

Staff reviewed alternatives to continued participation in the SWC. If the SWC was not funded, most of the activities currently conducted by the SWC would need to be provided by one or more of the individual contractors. As a result, the coordination with the other contractors on policy, science, regulatory comments, and advocacy would grow more complex, with potential duplication happening across the various contractors, including Metropolitan. With participation in the SWC, Metropolitan's Delta science initiatives are magnified, and the SWC recognizes Metropolitan's contributions by providing discounted charges. Further, Metropolitan's participation in the SWC at $4.16 million for FY 2023/24 is more than equally matched by the participation of the other SWC members ($5.1 million). For these reasons, in part, staff strongly recommends continued participation in the SWC.

Policy

Metropolitan Water District Administrative Code Section 11104: Delegation of Responsibilities

Metropolitan Water District Administrative Code Sections 11102 and 11103: Payment of Dues and Participation in Projects or Programs Serving District Purposes.

Metropolitan Water District Act Section 126: Dissemination of Information (requires a two-thirds vote)

By Minute Item No. 45348, the Board, at its May 13, 2003, meeting, authorized entering into an agreement with the State Water Project Joint Powers Authority.

By Minute Item No. 47735, the Board, at its December 9, 2008, meeting, authorized the General Manager to execute the Delta Habitat Conservation and Conveyance Program Memorandum of Agreement and three related funding and management agreements.

California Environmental Quality Act (CEQA)

CEQA determination for Option #1:

The proposed actions are not defined as a project under CEQA because they involve continuing administrative activities, such as general policy and procedure making (Section 15378(b)(2) of the State CEQA Guidelines). In addition, the proposed actions are not subject to CEQA because they involve other government fiscal activities, which do not involve any commitment to any specific project which may result in a potentially significant physical impact on the environment (Section 15378(b)(4) of the State CEQA Guidelines).

CEQA determination for Option #2:

None required

Board Options

Option #1

By a two-thirds vote, authorize payments of up to $4.16 million for participation in the State Water Contractors for FY 2023/24.

Fiscal Impact: Expend budgeted funds for participation in SWC in FY 2023/24 up to $4.16 million. The adopted budget contains $4.07 million for this item. The remaining $92,000 will be managed within Water Resource Management Group's overall budget.
Business Analysis: Metropolitan benefits from the SWC representing positions with DWR, legislators, regulatory, and third-party groups that advance its SWP strategic initiatives.

Option #2

Do not authorize payments for participation in the State Water Contractors for FY 2023/24.

Fiscal Impact: Reduces short-term expenditures in FY 2023/24 by up to $4.16 million. However, Metropolitan's internal costs would rise substantially because Metropolitan would need to take on many of the efforts currently provided by the SWC. In addition, Metropolitan would no longer benefit from the pooled resources of other contractors ($5.1 million) to obtain the same goals and outcomes.

Business Analysis: Metropolitan would be less effective in advancing its SWP strategic initiatives if the membership is not approved. Metropolitan would need to develop alternative means to manage the risk of higher costs or tighter operational restrictions on supply deliveries. Metropolitan's partnership with other SWP contractors would be diminished.

Staff Recommendation

Option #1

Brad Coffey 8/24/2023

Brad Coffey *Date*
Manager, Water Resource Management

8/28/2023

Adel Hagekhalil *Date*
General Manager

Attachment 1 – FY 2022/23 High Priority Accomplishments of the State Water Contractors

Attachment 2 – FY 2023/24 High Priority Objectives of the State Water Contractors

Ref# wrm12693382

FY 2022/23 High Priority Accomplishments of the State Water Project Contractors

Objective	Accomplishments
Water Supply	
Delta Conveyance Technical/Policy Support	• Participated in Delta Conveyance Project (DCP) technical and policy discussions with the Department of Water Resources (DWR) and conveyed contractors' perspectives. • Supported and facilitated State Water Contractors (SWC) discussions to advance the DCP Contract Amendment.
Delta Conveyance Permitting	• Coordinated with DWR daily on the environmental planning efforts for the DCP. Significant efforts included operations criteria, modeling, California Environmental Quality Act (CEQA), National Environmental Policy Act (NEPA), Endangered Species Act (ESA), California Endangered Species Act (CESA), U.S. Army Corps of Engineers Sections 404 and 408 permits, Delta Plan consistency determination, change in point of diversion, and the Community Benefits Program.
Drought Planning	• Engaged with DWR management, State Water Project (SWP) operators, and the contractors' management and staff on drought planning for the 2023 water year. • Worked with DWR to obtain funding for the contractors' drought projects.
Update to the Bay-Delta Water Quality Control Plan	• Collaborated with Voluntary Agreement parties to develop the program's components, including governance, science plan, and other agreements.
Water Supply and Operations Improvements	• Participated in real-time operations tracking workgroups, such as the Delta Monitoring Workgroup, that provides feedback on real-time operational decisions/recommendations. • Participated in various planning workgroups, such as Delta Coordination Group, that are responsible for implementing the summer-fall habitat action under the 2019 Biological Opinions (BiOps) /and 2020 Incidental Take Permit (ITP), which has water supply implications.
Infrastructure	
Infrastructure Reliability	• Led discussions within the Operations, Maintenance, and Engineering (OME) Committee and directly with DWR management/executives to emphasize the contractors' interest in the reliability of SWP infrastructure and track ongoing projects.
Capacity Reliability	• Extensively coordinated with DWR and contractors on California Aqueduct subsidence. Represented contractors' interest in strategic plan formation in coordination meetings with DWR, USBR, San Luis & Delta-Mendota Water Authority, and Friant Water Authority. • Pursue non-SWP funding opportunities for evaluating and alleviating impacts resulting from subsidence.

Objective	Accomplishments
	• Led the SWP Storage Expansion Workgroup. Communicated with DWR management/executives to emphasize the contractors' interest in opportunities to increase SWP capacity. • Routinely met with contractors to further align strategies to increase storage capacity.
Infrastructure Safety	• Led discussions and represented the interest of contractors within committees and directly with DWR management/executives to track projects, policy, and expenditures related to DWR's upgrade projects on both physical and cyber security of the SWP and infrastructure safety as it relates to the public and DWR employees. • Met with DWR and contractors in committees to obtain more in-depth updates on DWR's expanding dam safety program and specific details on the recent inspections, evaluations, engineering assessments, and modernizations of all SWP dams.
Infrastructure Affordability	• Engaged with DWR on the affordability workshop. • Continued to work closely with DWR and member agencies' staff and lobbyist to seek opportunities to obtain funding to help reasonably offset SWP expenses.
Business Processes	
Budgets	• Advanced the Process of Affordability concepts and enhanced budget information provided during DWR's annual Financial Management Conference. DWR, for the first time, published an SWP Annual Budget instead of only a revenue needs assessment.
Financial Projections	• Provided financial modeling to assist contractors in decision-making and planning. This included updating the SWC SWP Forecasting Model, the SWC 10-year Energy Forecasting Model, and the Contract Extension Cost Compression Model.
Energy	
Senate Bill No. 49 (Energy: Appliance Standards and SWP Assessment) Report	• Engaged with DWR on the development of the Senate Bill. 49 Report, providing feedback on all nine tracks, including the potential for future discussions on items related to water delivery flexibility and siting of renewable energy resources. Conducted outreach to legislators and other leaders, including voicing support for elements of the report before the California Water Commission.
Energy Roadmap	• In conjunction with DWR and member agencies, completed the Energy Roadmap in 2022. The Energy Roadmap contains eleven sections, including the historical energy management of the SWP, past successful collaborations, core values of protecting the SWP's mission of delivering water, an interim action plan, and a communications plan to educate other stakeholders, leaders, and interested parties.

Objective	Accomplishments
Science	
Endangered Species Act (ESA), California Endangered Species Act (CESA), and Water Quality Control Plan (WQCP) Environmental Compliance	• Continued to coordinate with DWR on implementation of the Incidental Take Permit (ITP), including participation in various subgroups, discussion of adaptive management opportunities, and resolution of operational and other issues as they arose. • Worked with DWR to hold the Environmental Coordination Committee meetings quarterly. • Worked with DWR to hold the DWR-SWC Environmental Science Work Group meetings quarterly.
Outreach	
Position Awareness	• Participated in panel discussions, conferences, and briefings with stakeholders, legislators, and regulatory agencies to discuss the SWP and other relevant issues, including energy, state, and federal legislation and initiatives, the Delta and the environment, reliance on the SWP, Delta Conveyance, Voluntary Agreements, and other upcoming projects and priorities.
SWC Management	
Accounting	• Maintained internal financial records and provided regular reports to the SWC Board of Directors.

FY 2023/24 High Priority Objectives of the State Water Project Contractors

Objective	Description
Water Supply	
Delta Conveyance Technical/Policy Support	• Provide technical and policy support to State Water Contractors (SWC) members that are Delta Conveyance Project (DCP) participants, including assistance in completing the DCP contract amendment.
Delta Conveyance Permitting	• Support the development of necessary permits and environmental documentation related to the Delta Conveyance Facility.
Update to the Bay-Delta Water Quality Control Plan	• Participate in Voluntary Agreement development and discussions and related activities. Support governance and science-based analyses.
Water Supply and Operations Improvements	• Work towards defining flexible California Endangered Species Act (CESA) and Endangered Species Act (ESA) requirements, if possible, as part of the ongoing reconsultation on the Central Valley Project (CVP)-State Water Project (SWP) long-term operations to recognize the increasingly volatile hydrology. Identify potential risks to SWP and develop strategies to minimize them.
Infrastructure	
Infrastructure Reliability	Work with the Department of Water Resources (DWR) in the effort to maintain and improve reliability of the aging SWP Infrastructure with a focus on: • Continuing to work on the development/documentation/implementation of an asset management plan and capital improvement program. • Developing a tracking/communication process for members to better understand the roll-out and addition of future SWP-funded positions and the resulting benefits. • Assessing maintenance management systems to better identify vulnerabilities, the required risk mitigation strategies, and management policy and objectives. Advocate for appropriate priorities and affordability.
Capacity Reliability	Work with DWR to ensure SWP delivery capacity and storage capabilities meet current and future demands with a focus on: • Subsidence in the San Joaquin Valley, machine outages, power outages, regulatory requirements, weeds/debris, and water quality. • Advocating for projects, repairs, procedures, and studies to ensure that capacity is restored or preserved to assure long-term operational capacity. • Working with the SWC Storage Expansion Workgroup to develop a white paper summarizing the need, opportunity, and risks of potential expansion of SWP storage capacity.

Objective	Description
Infrastructure Safety	Work with DWR and member agencies to plan and ensure SWP infrastructure safety with a focus on: • SWP seismic vulnerability studies and planning/preparing for realistic response and recovery. • Regulatory requirements on dam safety, including the Oroville Dam Comprehensive Needs Assessment, to assure timely remediation. • Fire modernization project efforts for all SWP pumping/generation plants.
Infrastructure Affordability	Work with DWR and member agencies on measures to improve SWP infrastructure affordability with a focus on: • Tracking implementation of Business Case Evaluations, Value Engineering Studies, and asset management-informed processes. • Supporting and assisting in the development of a capital improvement plan that relies on asset management data to ensure affordability and certainty in the SWP budgeting process. • Seeking opportunities and working with members to obtain outside State and Federal funding for repairs and modification for co-owned facilities, damages sustained beyond normal SWP operations, and climate change resiliency.
Business Processes	
Budgets	Monitor and promote DWR's development and management of an SWP budget to minimize annual variances and optimize reasonable revenue requirements, including: • Short-term planning and budgeting of Capital, Operations and Maintenance (O&M), and Variable Costs. • Process of Affordability Project (1-5 Year Budget Forecast of Capital, O&M, and Variable Costs). • Monitoring DWR's Budget Change Proposals (Create SWC Reporting Dashboard on DWR's change to authorized positions).
Financial Projections	Monitor and promote DWR's analysis, development, and management of SWP's cost trends to maximize operational readiness at an optimal cost level ensuring long-term affordability, including: • Long-term Forecasting (Projections) of Capital, O&M, and Variable Costs. • The Process of Affordability Project (5-10-15-20-Year Forecast of Capital, O&M, and Variable costs).
Financial Resources, Revenue Requirements, and Investments	Monitor and assess DWR's State Water Project financial performance regarding operational goals, budgets, financial targets, and forecasts to maximize the use of available revenues and optimize the determination of revenue requirements, including: • Implementation of Contract Extension Amendment Billing Provisions, and • State Water Project Financial Roadmap in coordination with DWR.

Objective	Description
Energy	
Senate Bill No. 49 (Energy: Appliance Standards and SWP Assessment) Report	• Collaborate with DWR to brief stakeholders on the report's content and advocate for appropriate funding sources for identified tracks.
Energy Roadmap	• Work with DWR to continue implementing and updating the Energy Roadmap to reflect recent budgetary and legislative changes.
Science	
Endangered Species Act (ESA), California Endangered Species Act (CESA), and Water Quality Control Plan (WQCP) Environmental Compliance	Collaborate with DWR to improve the Environmental Science Workgroup to facilitate planning and implementation of required habitat, mitigation, and monitoring, including. • Work with DWR to hold Environmental Coordination Committee meetings at least quarterly and develop requested information relative to costs and efficacy of required monitoring and other actions. • Engage the Environmental Science Work Group and hold meetings at least quarterly. • Work towards defining requirement offramps for science elements and seek permit amendments. • Ensure costs are split equitably with the United States Bureau of Reclamation (USBR).
Outreach	
Position Awareness	• Proactively drive SWC messaging and legislative positions to the media (i.e., key reporters, editorial boards), key stakeholders, legislators, and regulatory agencies to elevate the organization's position on priority issues.
SWC Management	
Accounting	• Oversee all financial and accounting operations. Establish financial policies, procedures, controls, and reporting systems to ensure the accuracy and integrity of financial data.
Treasury	• Ensure SWC retains adequate liquidity to meet the needs of its primary business operations and respond to organizational threats as needed.

One Water and Stewardship Committee

Authorize Payments Totaling $4.16 million to State Water Contractors

Item 8-2

September 11, 2023

Background Information

State Water Contractors

Established 1982

- 27 Members
  - 22 Urban contractors
  - 4 Agriculture contractors
  - 1 Urban and agricultural contractor
- 9 Board members

Background Information

State Water Contractors

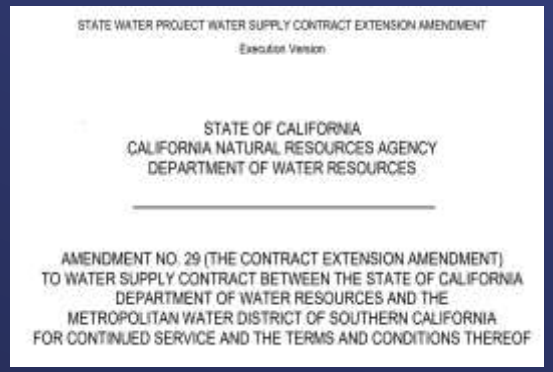
Nonprofit Association

- Focus on policy, advocacy, and legal issues and project implementation
  - Pursue reliable and cost-effective management of the State Water Project (SWP)
  - Unified voice on SWP issues
  - Provide legal support

Background Information

State Water Contractors

Major Accomplishments in FY 2022/23


STATE WATER PROJECT WATER SUPPLY CONTRACT EXTENSION AMENDMENT

Executed Version

STATE OF CALIFORNIA
CALIFORNIA NATURAL RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

AMENDMENT NO. 29 (THE CONTRACT EXTENSION AMENDMENT)
TO WATER SUPPLY CONTRACT BETWEEN THE STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES AND THE
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA
FOR CONTINUED SERVICE AND THE TERMS AND CONDITIONS THEREOF

Photo Credit: DWR

Photo Credit: DWR

- Coordination with DWR SWP Financial Manager
- SWP contract extension
- Meeting renewable energy goals
- Infrastructure and affordability

Background Information

State Water Contractors

Major Objectives in FY 2023/24

Photo Credit: DWR

Photo Credit: DWR

Photo Credit: DWR

- Science and research engagement
- Infrastructure reliability and safety
- Cost affordability
- SWP storage

Metropolitan's Payment to State Water Contractors

	MWD $	Basis
Dues Fund $4.08M	$2.07M	Table A and water delivery
Bay-Delta Fund $3.58M	$1.09M*	Table A with credit for staff contributions
Delta Conveyance Project Fund $0.85M	$0.45M	Presumed participation in project
Energy Fund $0.42M	$0.29M	Energy use
Municipal Water Quality Investigation	$0.26M**	Table A of participating contractors

* Net of 45 percent or approximately $560,000 discount (excluding legal fees)
** Based on MWD's FY 2023/24 budget

Summary

- Important association providing effective representation in dealings with DWR, state legislature, courts, and regulators
- Requested payment authorization amounts are more than budgeted
  - SWC – $4.16 million
  - MWD's approved budget – $4.07 million
- Board approval by two-thirds vote required

Alternatives Considered

- If Metropolitan continues to participate: (Option 1)
  - Delta science initiatives are magnified
  - Our participation leverages significant funding from other SWC members
- If Metropolitan doesn't continue to participate: (Option 2)
  - Partnership with other SWP contractors would be diminished
  - Rise in internal costs

Director Question

1

What discount did MWD receive for staff time last year?
What would our dues be without the discount?
Do the discounts correlate directly to the overlap?
Why not if they don't?

- Offset recognizes MWD's science-related efforts that supplement SWC efforts.
- MWD receives a 45% offset on the Bay-Delta fund dues ($560,000).
- MWD dues would increase by $560,000 without the offset
- Other contractors pay for this offset in their dues

Director Question

2 (a)

What is the specific overlap in research projects that Metropolitan participates and contributes to directly that the SWC is also involved with?

Science funded over 2 years

Topic	MWD Contribution	SWC Contribution	Others Contribution	Total	MWD Share
Delta Smelt	$1.3	$1.1	$29.1	$31.5	4%
Salmon	$1.0	$0.5	$7.2	$8.8	12%
Food web	$0.2	$0.1	$1.5	$1.8	12%
Longfin Smelt	$0.2	$0.2	--	$0.4	46%
Modeling	$0.3	--	--	$0.3	100%
Fish Surveys	$0.2	--	--	$0.2	100%
Other	$0.1	--	$0.3	$0.4	33%
Total	$3.4	$2.0	$38.1	$43.5	8%

Director Question

2 (b)

SWC science program will fund these new projects and approximately 40 active projects

ICF Jones & Stokes, Inc.	Testing and Quantifying a Conceptual Model for the Response of Longfin Smelt to Outflow
Anchor QEA	Evaluation of the Influence of State Water Project and Central Valley Project on Chinook Salmon and Steelhead Movements and Distribution in the South Delta
FISHBIO	Improving Understanding of Survival, Mortality and Habitat Use of Emigrating Salmonids Through Applications of Multistate Survival Models
Trout Unlimited	Central Valley and Delta Salmon Habitat Data Modeling and Management
UC Davis	Applying a Response Spectrum Model to Assess Spatial and Temporal Differences in Effects of Pesticide Mixtures on Juvenile Chinook Salmon in the Delta
San Francisco State	Cooling California Rivers: Developing a Spectral Physically Based Energy Balance Model to Predict and Manage River Temperatures for Salmon Under Current and Future Climates

Director Question

3

What are the specific dues that other contractors pay

- The total SWC dues are $8.9M (MWD=$3.9M; Others=$5M)
  - The SWC budget includes carryover funds
- Top 8 contractor dues allocation
  - Kern County Water Agency ($1.54 M)
  - Santa Clara Valley Water District ($0.48 M)
  - Antelope Valley-East Kern Water Agency ($0.39 M)
  - Coachella Valley Water District ($0.35 M)
  - San Bernadino Valley MWD ($0.28 M)
  - Santa Clarita Valley Water District ($0.25 M)
  - Mohave Water Agency ($0.22 M)
  - Other 19 participants ($1.5 M)

FY 2023-24

Director Question

4 (a)

Who are the individual board members of the SWC and who do they represent?

- 27 of 29 State Water Project Contractors are members of the SWC
- The 27 agencies are divided into 8 classes
- SWC Board governed by 9 members, all senior managers or executives of their agency

Board Approval Requires:

- A majority of directors if quorum exists
- Any director may call for reconsideration using proportionate Table A voting

Director Question

4 (b)

Who are the individual board members of the SWC and who do they represent?

- Contractors are organized into eight classes
  - Class 1 — Thomas Pate — Solano County WA, Yuba City, Napa County FCWCD
  - Class 2 — Laura Hidas — Alameda County Water District, Alameda Zone 7 Water Agency, Santa Clara Valley WD
  - Class 3 — Jacob Westra — County of Kings, Dudley Ridge WD Tulare Lake Basin WSD, Empire West Side ID, Oak Flat WD
  - Class 4 — Craig Wallace — Kern County Water Agency
  - Class 5 — Ray Stokes — Central Coast Water Agency San Luis Obispo FCWCD

Director Question

4 (c)

Who are the individual board members of the SWC and who do they represent?

- Contractors are organized into eight classes
  - Class 6 — Brad Coffey — Metropolitan Water District
  - Class 7 — Matt Stone — Santa Clarita Valley Water District, Casitas Municipal Water District
  - Class 8 — Peter Thompson, Robert Cheng — Antelope Valley East Kern, Coachella Valley Water District, Crestline-Lake Arrowhead WA, Desert WA, Mohave WA, Palmdale WD, Littlerock Creek ID, San Bernardino Valley MWD, San Gabriel Valley MWD, San Gorgonio Pass Water Agency

Director Question

5 (a)

What are the salaries/benefits paid to the staff hired by the SWC and what is the percentage of total income paid to consultants?

FY 2023-24

Fund	Salaries	Benefits	Total
Dues	$1,254,000	$660,000	$1,914,000
Energy	$181,000	$64,000	$245,000
Bay-Delta	$189,000	$65,000	$254,000
Delta Conveyance	--	--	--
Totals	**$1,624,000**	**$789,000 (32.7%)**	**$2,413,000**

Director Question

5 (b)

What are the salaries/benefits paid to the staff hired by the SWC and what is the percentage of total income paid to consultants?

FY 2023-24

Position	Salary Range
General Manager	$234,000 - $309,000
Dept. General Manager	$202,000 - $237,000
O&M/Power Engineer 1	$170,000 - $212,000
O&M/Power Engineer 2	$186,000 - $231,000
Science Manager 3	$170,000 - $199,000
Sr. Mgmt. Financial Analyst 3	$154,000 - $182,000
Controller	$154,000 - $182,000
Executive Assistant 3	$83,000 - $99,000
Office Manager 3	$83,000 - $99,000

Director Question

5 (c)

What are the salaries/benefits paid to the staff hired by the SWC and what is the percentage of total income paid to consultants?

FY 2023-24

Category	Item	% of Total Budget
Labor	$2,413,000	24%
Science Consultants	$2,000,000	20%
Non-Science Consultants	$1,547,000	15%
Legal expenses	$2,160,000	21%
Office and Other	$2,119,027	21%
Total	**$10,239,027***	**100%**

*This amount is SWC budget

Director Question 6

Is there any overlap in consultants hired by MWD and those hired by the SWC?

Ten Consultants are contracted with MWD & SWC	
34 North	Anchor QEA
Best, Best and Krieger	Cramer Fish Sciences
Humboldt State University	ICF Jones & Stokes
Kearns & West	Resource Management Associates
Tetra Tech	University of Calif., Davis

Of 446 consultants between SWC and MWD, 2 percent overlap

No current MWD staff are employed by or contracted with the SWC.

Other Director Questions

7

Are any MWD staff employed by or contracted with the SWC?

- **Current MWD Employees**
  - No MWD employees are employed by or under contract with the SWC
- **Former MWD Employees**
  - Consultants (Independent or Contracted through Others)
    - Five employees
  - SWC Staff
    - One employee

Board Options

Option #1:

By a two-thirds vote, authorize payments of up to $4.16 million for participation in the State Water Contractors for FY 2023/24.

Option #2:

Do not authorize payments for participation in the State Water Contractors for FY 2023/24.

Staff Recommendation

Board Options

Option #1

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

MANAGEMENT OF THE

CALIFORNIA STATE WATER PROJECT

BULLETIN 132-2019 | DECEMBER 2022

GAVIN NEWSOM
Governor, State of California

WADE CROWFOOT
Secretary for Natural Resources
California Natural Resources Agency

KARLA A. NEMETH
Director
Department of Water Resources

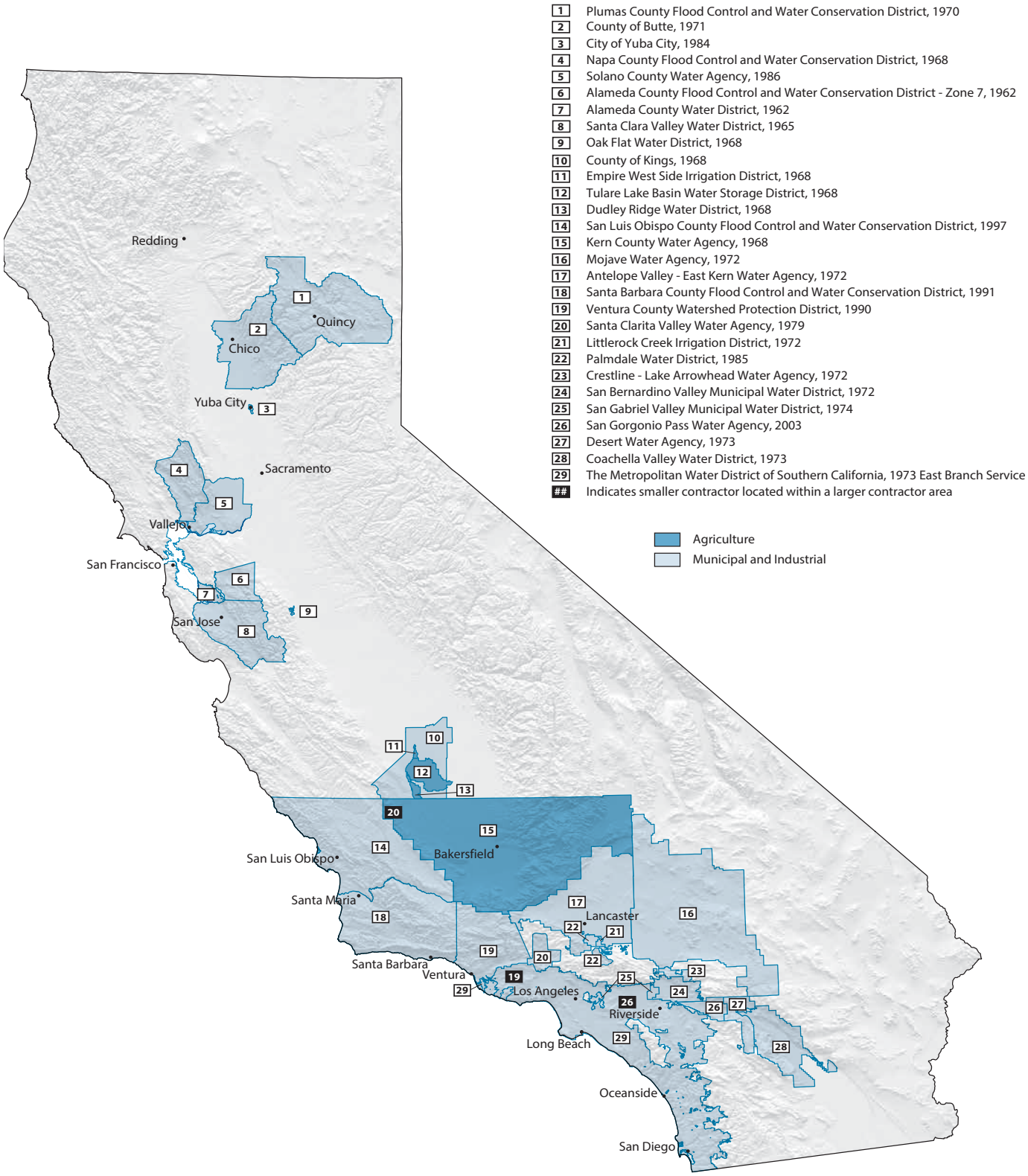


Figure 1-2 **Names, Locations, and First Year of Service of SWP Contractors, December 31, 2018**

Table 1-6 SWP Contractors, by Area, as of December 31, 2018

Contractor	Cumulative Deliveries (acre-feet)[1]	Annual Table A (acre-feet)	Payments (in dollars)[3]	Gross Area (acres)	Assessed Valuation (in dollars)[2]	Estimated Population
Upper Feather River Area						
City of Yuba City	52,968	9,600	10,081,039	10,133	4,713,051,974	71,070
County of Butte	125,180	27,500	15,375,128	1,049,280	22,349,533,559	227,621
Plumas County Flood Control and WCD	13,495	2,700	3,114,751	1,676,056[a]	2,401,991,425	19,517
Subtotal	*191,643*	*39,800*	*28,570,918*	*2,735,469*	*29,464,576,958*	*318,208*
North Bay Area						
Napa County Flood Control and WCD	376,825	29,025	158,201,152	510,010	37,426,336,858	139,099
Solano County Water Agency	957,613	47,756	211,195,701	581,760	52,336,931,797	445,458
Subtotal	*1,334,438*	*76,781*	*369,396,853*	*1,091,770*	*89,763,268,655*	*584,557*
South Bay Area						
Alameda County Flood Control and WCD–Zone 7	1,798,639	80,619	446,207,870	275,900	61,116,475,735	261,261
Alameda County Water District	1,414,376	42,000	171,104,954	66,943	72,179,061,738	356,000
Santa Clara Valley Water District	4,565,289	100,000	523,237,974	835,098	445,800,903,298	1,938,153
Subtotal	*7,778,304*	*222,619*	*1,140,550,798*	*1,177,941*	*579,096,440,771*	*2,555,414*
San Joaquin Valley Area						
County of Kings	174,693	9,305	14,321,816	893,300	9,125,193,927	149,942
Dudley Ridge Water District	2,523,846	45,350	119,946,334	37,600	141,772,718	36
Empire West Side Irrigation District	128,570	3,000	6,079,476	7,500	[b]	12
Kern County Water Agency	39,974,016	982,730	2,700,282,758	5,224,000	91,300,000,000	893,119
Oak Flat Water District	221,202	5,700	10,117,377	4,500	[b]	10
Tulare Lake Basin Water Storage District	5,096,417	87,471	228,721,573	189,519	194,000,000	23
Santa Clarita Valley Water Agency[4]	409,606			8,700[c]	4,532,936	0
Subtotal	*48,528,350*	*1,133,556*	*3,079,469,337*	*6,365,119*	*100,765,499,581*	*1,043,142*
Central Coastal Area						
San Luis Obispo County Flood Control and WCD	91,441	25,000	122,256,900	2,122,240	45,457,307,011	279,083
Santa Barbara County Flood Control and WCD	474,971	45,486	829,437,218	193,391	35,807,064,847	377,338
Subtotal	*566,412*	*70,486*	*951,694,118*	*2,315,631*	*81,264,371,858*	*656,421*
Southern California Area						
Antelope Valley-East Kern Water Agency	2,334,938	144,844	700,566,399	1,525,120	27,976,622,749	401,610
Coachella Valley Water District	1,716,446	138,350	749,117,090	639,857	61,209,789,634	290,000
Crestline-Lake Arrowhead Water Agency	67,708	5,800	35,910,946	54,900	2,755,274,108	29,000
Desert Water Agency	1,383,445	55,750	393,156,882	208,000	15,088,220,829	64,000
Littlerock Creek Irrigation District	21,066	2,300	8,742,679	10,355	414,200,000	2,900
The Metropolitan WD of Southern California	39,979,392	1,911,500	13,654,132,124	3,316,072[d]	2,901,129,926,343	18,963,000
Mojave Water Agency	500,898	85,800	401,999,081	3,136,000	35,761,893,294	480,941
Palmdale Water District	305,721	21,300	111,203,098	119,680	1,414,494,581	114,533
San Bernardino Valley Municipal Water District	1,158,875	102,600	883,682,999	225,577	48,717,699,229	661,546
San Gabriel Valley Municipal Water District	488,560	28,800	213,221,059	18,297	16,850,589,307	197,636
San Gorgonio Pass Water Agency	96,621	17,300	246,269,797	140,800	9,382,528,227	91,260
Santa Clarita Valley Water Agency[4]	1,261,545	95,200	464,052,571	125,057[c]	43,409,583,907	282,460
Ventura County Watershed Protection District	94,156	20,000	86,912,502	308,252	50,463,927,012	472,776
Subtotal	*49,409,371*	*2,629,544*	*17,948,967,227*	*9,827,967*	*3,214,574,749,220*	*22,051,662*
Total	**107,808,518**	**4,172,786**	**23,518,649,251**	**23,513,897[e]**	**4,094,928,907,043**	**27,209,404**

[1] All water delivered to SWP Contractors, including carryover, Article 21, surplus, unscheduled, exchange, permit, purchased, local, and non-SWP water.
[2] Statutes of 1978, Chapter 1207, added Section 135 to the Revenue and Taxation Code, requiring assessment at 100 percent of full value for the 1981–1982 fiscal year and fiscal years thereafter.
[3] Includes all payments pursuant to the repayment provisions of the Water Supply Contracts. Transportation and Conservation Replacement Accounting System payments are also included in this table.
[4] Castaic Lake Water Agency's SWP Water Supply Contact was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.
[a] Total of all Plumas County Flood Control and Water Conservation District, including Last Chance Creek Water District.
[b] Assessed valuation not available on an agency area breakdown.
[c] Santa Clarita Valley Water Agency (Southern California Area) includes land in the San Joaquin Valley Area formerly known as Devil's Den Water District.
[d] Acreage for Metropolitan includes Calleguas Municipal Water District, which is common to Metropolitan and Ventura County Watershed Protection District.
[e] Includes duplicate values. Portions of some contractors' gross acreage fall within two contractors' geographic areas and are included in each contractor's total.
WD = Water District; WCD = Water Conservation District.
Dudley, Empire, Oak Flat, and Tulare are agricultural contractors. Kern is an agricultural and a municipal and industrial contractor.

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

BOARD ACTION

- Board of Directors
  One Water & Stewardship

9/12/2023 Board Meeting

8-3

Subject

Review and consider the Addenda Nos. 1, 2, and 3 to the Mitigated Negative Declaration previously adopted by the Antelope Valley-East Kern Water Agency for the High Desert Water Bank; approve changes to the design, construction, and operation of Water Bank facilities; authorize up to $80 million for additional costs associated with these changes; the General Manager has determined that a portion of the proposed action is exempt or otherwise not subject to CEQA

Executive Summary

In 2019, Metropolitan and Antelope Valley-East Kern Water Agency (AVEK) entered into an agreement (2019 Agreement) under which Metropolitan pays for the construction, operation, and maintenance of facilities related to the High Desert Water Bank (Water Bank). In return, Metropolitan may store up to 280,000 acre-feet (AF) of its State Water Project (SWP) supplies in the Antelope Valley groundwater basin with a 10 percent loss when adding water to the bank. Metropolitan has first priority to 70,000 AF per year of put-and-take capacity in the Water Bank.

The 2019 Agreement provides that Metropolitan and AVEK will agree in writing to the final design, construction schedule, and overall budget for the Water Bank. If, at any point, capital costs are anticipated to exceed the original budget estimate of $131 million, then Metropolitan may either scale down the Water Bank facilities or pay the additional costs.

As reported to the One Water and Stewardship Committee in March 2023 (see **Attachment 1**), various unforeseen issues have impacted the Water Bank and increased its estimated costs since it was approved four years ago. These include (1) higher-than-anticipated rates of inflation due to supply chain constraints and other factors; (2) revisions to the design, construction, and operation of the Water Bank's recharge and recovery facilities, which are necessary to achieve the original performance targets; (3) the need for additional electrical infrastructure to support the operation of the Water Bank's facilities; and (4) changes in the anticipated quality of recovered water, which will now require construction of a treatment facility as part of the Water Bank. For the last item, additional analysis and modeling are required to understand better the groundwater basin's potential water quality changes over time and the project's potential impacts on nearby private and agricultural wells. The additional modeling will help staff select the appropriate treatment technology and optimize the design of the treatment system and remaining recovery wells. Accordingly, staff requests that the Board approve changes to the design, construction, and operation of the Water Bank and authorize up to $80 million for the additional costs associated with these changes.

Details

Background

In April 2019, the Board authorized the General Manager to enter into the 2019 Agreement with AVEK. The Board approved capital payments of up to $131 million for the construction of monitoring and production wells, turn-in/turnout facilities off the California Aqueduct, underground pipelines, recharge basins, and water storage and booster pump facilities. The $131 million cost estimate did not include cost escalation, off-site power distribution, groundwater treatment, or flood protection. When complete, the Water Bank will provide the Metropolitan service area with valuable supply benefits. The Water Bank, like Metropolitan's other SWP

groundwater storage programs, will help manage surplus supplies and provide dry-year regional reliability. The Water Bank will also provide increased emergency reliability with a direct pump back of stored water into the California Aqueduct when needed. The location of the Water Bank downstream of the Edmonston Pumping Plant provides additional resilience. Staff is pursuing an opportunity to deliver supplies to the West Branch and increase supply reliability of SWP-dependent areas. The potential connection to the West Branch would not diminish the need, as established by board action in August 2022, for Metropolitan to reconfigure and expand (1) its existing portfolio to provide sufficient access to the integrated system of water sources, conveyance and distribution, storage, and (2) programs to achieve equivalent levels of reliability to all member agencies.

To date, Metropolitan has paid approximately $65 million to reimburse AVEK for Water Bank costs. AVEK has completed the construction of ten recovery wells, five monitoring wells, and the turn-in/turnout facilities for the California Aqueduct. Construction of the Stage 1 Recharge Basins was completed last month, and Metropolitan plans to begin delivering SWP supplies to the Water Bank to store in September. Once the Water Bank is operational, Metropolitan will be responsible for the actual operation, maintenance, and power costs for the facilities when used for Metropolitan's benefit. There are no put fees to store water in the Water Bank. However, Metropolitan will pay AVEK a recovery usage fee of $100/AF (escalated annually by the Consumer Price Index). Additionally, 10 percent of the water Metropolitan delivers for storage is subject to a one-time loss/leave behind.

In February 2023, Metropolitan initiated a new planning process to address enterprise-wide climate adaptation. This Climate Adaptation Master Plan for Water (CAMP4W) will include rigorous technical analysis as developed in the IRP, but also more explicitly address reliability, resilience, affordability, and fiscal sustainability in the face of potentially severe climate impacts in the coming decades. This process will review projects, such as the Water Bank, and assess their climate resilience, cost-effectiveness, benefit to disadvantaged communities, and role in adjusting the business model for Metropolitan. At first glance, these types of banking projects favorably align with CAMP4W goals due to their mitigation of increasing climate whiplash effects, relatively low power use, and competitive cost compared to other water supply options.

Summary of Revisions to Water Bank and Estimated Costs

As construction of the Water Bank facilities progressed, staff regularly met with AVEK to get updates on project status, milestone achievements, and challenges. This action builds off the March 2023 information item provided to the One Water and Stewardship Committee (see **Attachment 1**), where staff shared the unforeseen issues affecting the design, performance, and estimated costs of the Water Bank. In the information item, staff disclosed that (1) inflation significantly increased projected costs, (2) groundwater modeling calibrated using pilot recovery wells revealed the need for additional and deeper wells to achieve the recovery target, (3) water quality testing of the deeper pilot recovery wells revealed naturally occurring arsenic levels above the California Maximum Contaminant Level (MCL), potentially requiring treatment before pumping into the California Aqueduct, and (4) costs for off-site power distribution were not included in the original cost estimate because Southern California Edison had not yet finished their study to estimate costs. Each of these items is detailed below.

Recharge and Recovery Facilities

Design Changes. Various design elements were modified to optimize the Water Bank facilities. When Metropolitan's Board approved the Water Bank, it was anticipated that 23 recovery wells, not to exceed 500 feet in depth, would be needed to meet the targeted production of 70,000 AF per year. As work progressed, it became apparent that the Water Bank facilities, as initially designed, could not deliver 70,000 AF per year. Updated modeling revealed that meeting the recovery capacity goal of 70,000 AFY required drilling all wells deeper and increasing the total number of wells by four. Specifically, the depth of the wells was increased from approximately 500 feet below ground surface (bgs) to approximately 1,000 feet bgs, and the total number of wells was increased from 23 to 27. To date, ten of the 27 recovery wells are complete. Testing and modeling of these wells indicate that these design changes should be adequate to meet the targeted production.

Additionally, the turnout facilities were modified from two (one new 150 cubic feet per second (cfs) turnout off the California Aqueduct, and rehabilitation of an existing 50 cfs turnout) to one (a single new 250 cfs turnout). Furthermore, other design enhancements were incorporated, such as flood protection to protect investment in facilities and engineered basins rather than push-up berms, which minimize downtime during wet years when Metropolitan would use the recharge facilities.

Budget and Cost. Increasing the depth and number of wells results in additional capital costs of about $29 million, and certain other design changes add another $13 million. However, Metropolitan and AVEK staff have identified opportunities to save costs without compromising Water Bank performance. For example, the redesigned recharge facilities increased the gravity-fed areas and eliminated the need to pump into recharge basins, saving about $27 million in future costs. Thus, these design changes result in an overall increase of $15 million.

More significantly, the Water Bank has been impacted by rising material and construction costs and a constrained supply chain slowing the acquisition of materials and equipment. Significant inflation increases since 2018 resulted in a 30 percent cost increase over this period compared to the anticipated three percent inflation rate yearly. Recent construction bids received are higher than the estimates, consistent with the Construction Cost Index. The estimated cost increase due to higher-than-anticipated inflation and, including future projected inflation, is about $54 million.

All told, the net increase in capital costs is $69 million.

Project Component	Incremental Cost Change
Design Enhancements	
New and deeper wells	+ $29M
Gravity-fed recharge facilities	-$27M
Various other changes	+ $13M
Inflation	+ $54M
Total	**$69M**

Power Distribution Facilities

Design Changes. The Water Bank's power distribution system requires on-site and off-site electrical infrastructure. The on-site infrastructure will be designed, constructed, and owned by AVEK, whereas the off-site infrastructure will be designed, constructed, and owned by Southern California Edison (SCE). Off-site power facilities, in turn, include both "Standard Facilities" and "Added Facilities." Standard Facilities are those that SCE typically would install to provide electrical service to a customer, whereas "Added Facilities" are those provided at the customer's request to meet its particular electrical needs. Standard Facilities are paid by SCE; Added Facilities are paid by the customer.

In August 2022, SCE completed a Method of Service (MOS) study, which includes a conceptual design and estimated cost for the required off-site facilities. Based on the conceptual design, SCE plans to take power from the nearest substation at Neenach via a new 66 kV transmission line to a new substation to be constructed adjacent to the Water Bank site. AVEK is responsible for the on-site infrastructure and will install three 12 kV power lines within the site to power the Water Bank facilities, including the additional wells and future treatment system.

Budget and Cost. The on-site infrastructure was included in the initial design and original cost estimate (prepared in 2018) for the Water Bank. The original estimate did not include any capital costs of bringing power to the site because SCE had not yet completed its MOS study. Based on the MOS study's conceptual design, the estimated capital cost for the required off-site power facilities is approximately $80 million. Of this amount, approximately $11 million is associated with the Added Facilities assigned to AVEK as the customer, which ultimately would be paid by Metropolitan.

Prior to beginning work on the off-site power facilities, SCE requires AVEK to enter into a Letter of Agreement (LOA) under which it would pay SCE upfront for the total estimated cost of the Added Facilities. This payment would support SCE's engineering, design, procurement, and licensing for both the Standard and Added Facilities. Moreover, if SCE anticipates that costs for this work will exceed the upfront payment, then SCE may require AVEK to pay the additional amount before continuing work under the LOA.

Several aspects of the LOA are worth noting. First, the LOA does not include any work related to the actual construction of these off-site power facilities. Instead, construction of these facilities would be governed by a separate Added Facilities Agreement (AFA) that would be entered into between AVEK and SCE once all work under the LOA has been completed and the final design has been approved. Second, the LOA and MOS generally assume that AVEK will take the lead on any environmental reviews, studies, or analyses that may be required under the California Environmental Quality Act (CEQA) or other applicable laws as a prerequisite to construction. If SCE determines that the environmental documentation prepared by AVEK is not adequate to support construction of the Added Facilities, SCE will prepare the requisite documents, which would result in additional costs. Third, SCE will provide a credit toward the Added Facilities' construction cost for any work performed under the LOA associated with the Standard Facilities. However, this credit is only issued upon execution of the AFA by AVEK and SCE. Should AVEK opt not to have SCE move forward with the construction of the off-site power facilities, any such credits would be forfeited.

The $80 million capital increase requested in this letter includes the $11 million required to be paid upfront by AVEK to SCE under the LOA. Once all work under the LOA is completed, SCE will provide a revised estimate to construct the off-site power facilities. At that time, AVEK's (and thus Metropolitan's) proportionate cost share may increase. If this happens, staff will return to the Board to request additional funding before proceeding.

Treatment Facility

Design Changes. Arsenic levels in eight of the ten completed recovery wells (at 1000 ft. bgs) are currently above the California MCL of 10 micrograms per liter (µg/L)[1]. Concentrations in all ten wells range from 8.4 to 20 µg/L. The arsenic occurs naturally in the deeper aquifer, and arsenic levels exceeding the MCL are widespread throughout deeper portions of the basin.[2] Recovered water above the MCL requires arsenic removal before entering the California Aqueduct. The current recommended treatment process for arsenic includes coagulation and sedimentation. However, the wells contain other constituents of concern that are not currently above the MCL but may require treatment in the future to comply with the Department of Water Resources' Pump-in Policy, and Metropolitan's Board adopted policies governing the introduction of new water sources into treated and untreated conveyance facilities. For example, nitrate levels in the ten completed recovery wells range from 2.7 to 5.9 mg/L as nitrogen (N), below the MCL of 10 mg/L as N.

Budget and Cost. In March 2023, at the One Water and Stewardship Committee, staff provided a preliminary cost estimate of $29 million for the construction of a treatment facility and $4.2 million per year for O&M costs. Since that update, staff determined that additional groundwater analysis and modeling is needed to understand the basin's arsenic behavior, identify any other constituents of concern, and optimize the design of the remaining recovery wells and treatment system. The modeling will also assess potential water quality or hydraulic effects on nearby agricultural and private wells.

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[1] The California State Water Resources Control Board, Division of Drinking Water (DDW) is currently investigating the technological and economic feasibility of lowering the arsenic MCL below the current California and federal MCL and closer to the Public Health Goal of 0.004 µg/L.

[2] Depth-specific sampling show arsenic levels in the deep groundwater at concentrations up to 42 ug/L.

Once the treatment system design and cost estimate are better defined, and any potential impacts are identified, staff will return to the Board to report on water quality and hydraulic impacts, recommend a treatment approach, and request additional funding for the treatment system. Staff will also report to the Board on the remaining recovery wells and water quality data obtained from those wells. Staff will continue to monitor nitrate levels and any other potential constituents of concern and will consult with the Department of Water Resources' Facilitation Group on the pump-in proposal for this Water Bank.

Amendment to Existing Agreement

Staff is considering amendments to the existing agreement with AVEK, including extending the term of the agreement, potential credits for constructing oversized portions of the turnout structure and conveyance pipelines, credits for purchased land that may be surplus, and costs associated with requirements of the Antelope Valley Watermaster related to Water Bank operation. Staff will return to the Board to request authorization for any proposed amendments to the agreement and any additional costs (such as for the treatment system and CEQA) once they are determined.

The Water Bank's total capital cost increases to $211 million for the identified and quantified costs described earlier. As explained, the $80 million increase in estimated costs breaks down as follows: (1) $54 million for construction cost inflation, (2) $11 million for SCE power infrastructure, and (3) $15 million for design enhancements.

Construction Schedule

Facility construction should be complete in 2026. However, the Water Bank is not estimated to be fully operational until early 2027 (schedule shown below). The off-site electrical infrastructure needed to power the Water Bank facilities is now the critical path in determining when the Water Bank will become operational. As noted above, this off-site infrastructure will be designed and constructed by SCE and is currently estimated to take 39 months. SCE will begin working on the design of the facilities upon payment of the initial $11 million, which will be provided if authorized by the Board pursuant to this letter. Staff will continue to closely monitor construction progress and report any changes to the Water Bank's schedule in future updates.

Construction Schedule (subject to change)							
	2021	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Drilling Package 1	Completed						
Turnout Facilities	Completed						
Recharge Facilities							
Drilling Package 2	Completed						
Recovery Facilities							
Drilling Package 3							
Drilling Package 4							
Drilling Package 5							Full Operation
Power							

Initial Recharge of SWP Supply in 2023

Wet conditions this year resulted in a SWP Table A allocation of 100 percent (about 2 million AF for Metropolitan). Despite taking all available actions to store SWP supplies this year, over 400,000 AF of supply available to Metropolitan may be lost to the region.

Metropolitan plans to begin storing about 12,000 AF in the Water Bank this year to capture more of the abundant supply available. Storage operations will begin once agreements are executed with the Antelope Valley Watermaster (for storage) and the Department of Water Resources (for delivery). Storing more water this year will reduce the supplies otherwise lost to the region. Storing water now makes more supply available for pump back in future years and reduces the total time to fill the Water Bank.

Delivering to the Water Bank now presents some small risks, but staff believes they are manageable. First, the Board may defer or not approve future treatment costs, resulting in water stranded in the bank. Second, recharging water into the basin before additional modeling results are available could miss an opportunity to quantitatively determine if other basin pumpers could be harmed. Staff deems these risks manageable because (1) the 2019 Agreement allows AVEK to return water from the bank by exchange rather than pump back, and (2) only a relatively small volume (four percent of the Water Bank's capacity) will be recharged this year, reducing the potential to impact other water users.

Bond Financing Considerations

In the Adopted Biennium Budget for Fiscal Years 2022/23 and 2023/24 (the "Adopted Budget"), the Board approved bond financing of $97.9 million for the Water Bank, which reduces O&M expenditures for this supply program by converting short-term construction cash expenditures to debt service payments over the term of the bonds issued. Because the final year of the existing agreement is 2037, in the Adopted Budget, staff assumed an amortization period to match the remaining life of the minimum contract term, which is approximately fifteen years.

One option for the Board to consider with regard to funding the additional capital costs is to issue additional bonds. This approach would be consistent with the strategy approved in the Adopted Budget. If this approach is approved, the net fiscal impact of the delayed financing and increased capital costs is estimated to be less than $1 million for the term of the Adopted Budget. The additional debt financing costs, however, are estimated to increase supply program costs by $115 million over the fifteen-year term of the bonds, averaging about $6.8 million per year over prior annual budget projections. There is no measurable impact on adopted rates in the current Adopted Budget; however, over the 10-year financial forecast period, staff estimates the additional costs will increase overall long-term rates by one-third of one percent (0.33%).

Alternatives Considered

Staff considered other alternatives consistent with the terms of the 2019 Agreement. For example, at its discretion, Metropolitan may scale down the facilities to ensure that capital costs stay within the original estimated budget of $131 million. Nevertheless, AVEK intends to move forward with the entire Water Bank rather than downsizing. If AVEK builds the Water Bank without additional funding, then Metropolitan may need to negotiate with AVEK to access a smaller share of the project's capacity (currently about 62 percent). This percentage further decreases as additional treatment and electrical infrastructure costs are incurred, and Metropolitan does not fund those costs.

The Water Bank was modeled at its full capacity in the four-scenario gap analysis conducted under the IRP Needs Assessment. Limiting participation in the Water Bank would result in a need to acquire additional supplies during dry years to regain the supply reliability and resilience lost by downscaling the project through other new or existing supply programs. Assuming a 62 percent share of the Water Bank facilities described above, the additional supply need is about 30,000 AF. In a year like 2022, acquiring these additional supplies from dry-year transfers—if even available—would have cost about $30 million for one year alone. And in a wet year like 2023, Metropolitan's put capacity to storage would decrease, and supplies otherwise lost to the region would increase.

A second alternative considered was to pause all current construction activities in an orderly manner. This pause would provide additional time to complete groundwater modeling, confirm that nitrate treatment is not needed in the decades ahead, and select a robust and appropriately sized treatment facility for arsenic removal. Once these studies are complete (in about one year) and total estimated costs are known, staff would return to the Board for approval of full project funding. Benefits of this pause would reduce the uncertainty about the full project costs moving forward. These benefits must be balanced by the added costs of stopping and restarting the project, continuing inflationary pressure driving costs higher every year, and the delayed startup of a large pump-storage project which reduces SWP supply risks in dry years.

One additional factor that should be considered when weighing these alternatives is a proposal Metropolitan recently submitted to the U.S. Bureau of Reclamation (Reclamation) that is funded by Congressional appropriation of Inflation Reduction Act funds. The Water Bank operation captures surplus SWP supplies in wet years and delivers that supply in dry years. Absent this project, Metropolitan would need to secure more supplies delivered by the SWP system or, more likely, draw Colorado River water in to backstop the lost dry-year supply. Thus, this project directly offsets Colorado River use in the long term, making it eligible for Reclamation funding. The proposal seeks funding for constructing the new elements of the Water Bank (deeper wells, off-site power, and treatment). Although Reclamation funding is not assured, Metropolitan submitted a strong proposal.

Summary

Staff recommends that the Board approve the changes to the Water Bank discussed in this letter and authorize additional capital costs of up to $80 million for a total of up to $211 million. Although the changes described increase the overall costs for the Water Bank, some changes have also reduced costs, and opportunities exist to reduce costs in the future and to grant-fund the new infrastructure identified in this letter. For example, recharge facilities were redesigned to maximize the gravity-fed areas and remove the pumped recharge facilities, resulting in savings of $27 million. Redesigning the recharge basins also reduced the land required for the Water Bank's first phase. In addition, the turnout to the California Aqueduct, the off-site power distribution, and some conveyance pipelines have been or will be constructed with additional capacity for future expansion. Metropolitan will negotiate with AVEK for a credit for upsized facilities and unused land should Metropolitan not move forward with a future expansion of the Water Bank. When completed, the project will improve flexibility to store and recover water for emergencies and water supply needs and reduce the consumption of Colorado River supplies. In addition, the Water Bank increases Metropolitan's capabilities to respond to changing climate and water supply conditions.

Policy

By Minute Item 50302, dated November 10, 2015, the Board authorized entering into an agreement for Storage and Exchange Programs with AVEK.

By Minute Item 51564, dated April 9, 2019, the Board authorized entering into an agreement for the High Desert Water Bank Program with AVEK.

Metropolitan Water District Administrative Code Section 4203: Water Transfer Policy

Metropolitan Water District Administrative Code Section 11104: Delegation of Responsibilities

California Environmental Quality Act (CEQA)

CEQA determinations for Options 1 and 2:

On December 19, 2017, AVEK adopted a Mitigated Negative Declaration (MND) and issued a Notice of Determination (NOD) for the High Desert Water Bank. The MND/NOD concluded that, with the incorporation of specific mitigation measures, all of the potential environmental impacts associated with the Water Bank were less than significant. (See **Attachment 2**.) On April 9, 2019, the Board reviewed and considered the MND/NOD in conjunction with its approval of Metropolitan's participation in the Water Bank.

Concerning the recharge and recovery facilities, AVEK concluded that none of the proposed changes discussed above required the preparation of an environmental impact report or subsequent negative declaration pursuant to CEQA Guidelines section 15162. Accordingly, these changes were documented in Addendum No. 1 to the MND

as required under CEQA Guidelines section 15162, which was adopted by AVEK's board on October 26, 2021. (See **Attachment 3**.)

With respect to the treatment facility, AVEK likewise concluded that the construction and operation of such a facility as part of the Water Bank did not represent a substantial change that required the preparation of an environmental impact report or subsequent negative declaration. These proposed changes were documented in Addendum No. 2, which AVEK's board adopted on December 20, 2022. (See **Attachment 4**.) Addendum No. 3, prepared by Metropolitan, makes minor revisions to Addendum No. 2 to clarify certain water quality and treatment information. (See **Attachment 5**.) As discussed above, however, additional analysis and modeling will be completed, which could result in alterations to the nature, scope, and design of the treatment facility as reviewed in these two addenda. Thus, additional CEQA review, analysis, and mitigation may be required before the final design and construction for the treatment facility are approved.

Lastly, with respect to the off-site power facilities, the current Board action seeks approval of funding solely for design, engineering, and certain other pre-construction activities related to these facilities. Accordingly, proposed actions are categorically exempt under Section 15306 of the State CEQA Guidelines. As work under the LOA progresses, SCE will review all environmental documents prepared by AVEK for the Water Bank to determine if they incorporate SCE's proposed scope of work for the off-site power facilities. If SCE determines that additional environmental analyses and studies are required under CEQA, AVEK would complete such work. The Board would then review and consider those environmental documents before approving the construction and operation of any off-site power facilities.

CEQA determinations for Options 3:

None required

Board Options

Option #1

Review and consider Addenda Nos. 1, 2, and 3 to the Mitigated Negative Declaration previously adopted by the Antelope Valley-East Kern Water Agency for the High Desert Water Bank; approve changes to the design, construction, and operation of Water Bank facilities as discussed in this letter; and authorize up to $80 million for additional costs associated with these changes.

Fiscal Impact: The fiscal impact includes $80 million in increased capital costs attributed to power, design changes, groundwater quality, and inflation. Authorizes total capital costs up to $211 million with an understanding that staff will return to the Board for authority for additional costs for power and water treatment facility upon completion of analysis and design. In addition, Metropolitan would be responsible for recovery fees, actual energy, and operations and maintenance costs. These costs depend on actual usage. The additional fiscal impacts of the Water Bank are not currently included in the biennial budget and ten-year financial forecast.

Business Analysis: The High Desert Water Bank Program has been included in Metropolitan's long-term planning at its full program capacity of 70,000 AFY of put-and-take capability. The Program at full capacity is needed to increase storage and dry-year reliability for the region.

Option #2

Review and consider Addenda Nos. 1, 2, and 3 to the Mitigated Negative Declaration previously adopted by the Antelope Valley-East Kern Water Agency for the High Desert Water Bank, and (1) defer approval of the changes to the Water Bank discussed in this letter, and (2) defer authorization of additional funding until the treatment and off-site power costs are known.

Fiscal Impact: None

Business Analysis: No additional construction will be advertised or awarded. Additional costs would be incurred by stopping and restarting the project, and inflationary pressures would continue increasing program costs. Power design would be delayed resulting in a delayed start of operation beyond 2027. Metropolitan would need to find additional supplies in the interim period to help meet demands that would otherwise be met by operating the Water Bank.

Option #3

Do not approve the changes to the design, construction, and operation of Water Bank facilities as discussed in this letter, and do not authorize up to $80 million for additional costs associated with these changes.

Fiscal Impact: None

Business Analysis: Metropolitan may miss an opportunity to increase storage, resulting in a reduction of the region's emergency and water supply reliability and an increased use of Colorado River water to offset SWP shortages.

Staff Recommendation

Option #1

8/30/2023

Brad Coffey *Date*
Manager, Water Resource Management

8/30/2023

Adel Hagekhalil *Date*
General Manager

Attachment 1 – March 2023 Information Letter

Attachment 2 – AVEK Mitigated Negative Declaration

Attachment 3 – AVEK Addendum No. 1 to Mitigated Negative Declaration

Attachment 4 – AVEK Addendum No. 2 to Mitigated Negative Declaration

Attachment 5 – Metropolitan Addendum No. 3 to Mitigated Negative Declaration

Ref# wrm12683467

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

INFORMATION

- Board of Directors
  One Water and Stewardship Committee

3/14/2023 Board Meeting

9-2

Subject

Information on the High Desert Water Bank Program status, updated costs, and water quality

Executive Summary

This letter provides an update on the status, costs, and water quality of the High Desert Water Bank (HDWB) Program with Antelope Valley – East Kern Water Agency (AVEK). The estimated costs of the HDWB have increased since the 2019 Board authorization of $131 million to a current estimate of $210 million. Over the past four years, inflation has significantly increased, the off-site power distribution design was finalized, modeling based on four-pilot recovery wells revealed the need for additional wells to achieve the recovery target, and water quality testing of the pilot recovery wells revealed naturally occurring arsenic levels above the California Maximum Contaminant Level (MCL), potentially requiring treatment before pumping into the California Aqueduct. Based on the current construction schedule, the HDWB Program can begin recharging in Summer 2023 with full recharge and recovery operation in 2025. The current HDWB agreement provides:
(1) Metropolitan and AVEK will agree in writing to the final design, construction schedule, and estimated budget; (2) if the capital costs will exceed the budget, Metropolitan may either scale down the project to stay within the original budget of $131 million or pay the additional costs; (3) Metropolitan will pay the actual energy costs; and (4) if Metropolitan determines that water quality treatment is required before water is returned to Metropolitan, and if AVEK or a third party is not responsible for impairing water quality, Metropolitan can decide on the type of treatment to implement and would be required to pay actual treatment costs. Staff will return to the Board to request authorization for additional project costs, design changes, any necessary amendments to the HDWB agreement, and to provide regular updates.

Details

Background

In April 2019, the Board authorized the General Manager to enter into the HDWB Agreement with AVEK (HDWB Agreement) and provide up to $131 million for the construction of monitoring and production wells, turnouts from the California Aqueduct, underground and aboveground pipelines, recharge basins, and water storage and booster pump facilities. Metropolitan and AVEK executed the HDWB Agreement in December 2019. Once operational, Metropolitan is required to pay for the actual operation and maintenance (O&M) and power costs for the facilities when used for Metropolitan's benefit and, potentially, any required treatment costs. Under the program, Metropolitan may store up to 280,000 AF of its State Water Project (SWP) supplies in the Antelope Valley Groundwater Basin. In addition, Metropolitan has first priority to 70,000 AF per year of put and take capacity. AVEK has a secondary priority right to access the groundwater bank. At this point in time, there are no other participants in the groundwater bank. However, AVEK plans to develop additional capacity to bring new participants into future phases of the bank over time. Under the HDWB Agreement, Metropolitan can recover a portion of its costs should future participants utilize unused capacity that was developed by Metropolitan's investment in the program.

When completed, the HDWB will provide the region with valuable supply benefits. The HDWB, like Metropolitan's other SWP groundwater storage programs, will help manage surplus supplies and improve dry-year regional reliability. The HDWB will provide an increased emergency benefit with a direct pump back of stored water into the California Aqueduct when needed. The HDWB is downstream of the Edmonston Pumping

Plant and provides an additional factor of reliability. If the Edmonston Pumping Plant or facilities upstream are damaged by an earthquake or shut down due to another type of failure, stored water would be returned from the HDWB to help maintain deliveries. In addition to earthquake-related failures, the aging California Aqueduct is experiencing increased occurrences of failures, particularly in portions of the San Joaquin Valley upstream of the AVEK connection. Staff is also evaluating opportunities to deliver supplies to the West Branch and increase supply reliability of SWP-dependent areas.

High Desert Water Bank (HDWB) Program

Construction of the HDWB is on schedule and anticipated to be fully operational by the end of 2025. As of March 2023, AVEK has completed the construction of ten recovery wells. Current construction activities include work on turnout to the California Aqueduct and staged work of recharge basins allowing Metropolitan the ability to begin recharging in Summer 2023. To date, Metropolitan has paid approximately $50 million primarily for land acquisition, design, and construction of the HDWB facilities. Metropolitan's anticipated expenditure for the remainder of this fiscal year is approximately $12 million.

As construction of the HDWB progresses, staff regularly meets with AVEK to get updates on project status, milestone achievements, and challenges. Staff is in discussions with AVEK regarding unforeseen issues impacting the project and estimated project costs, including project design, the power distribution system, hydraulic variability, water quality, and inflation.

Power Distribution System

In 2018 when the original cost estimate was prepared, it did not include electrical distribution system costs to bring power to the project site. At that time, AVEK had not received the Method of Service (MOS) study and associated cost estimate from Southern California Edison (SCE). SCE recently completed a MOS study including the conceptual design and estimated distribution system costs. Based on the conceptual design, SCE will be taking power from the nearest substation at Neenach via a new 66 kV transmission line to a new substation adjacent to the project. AVEK will install three-12 kV power lines within the project site to power the project facilities. SCE will own all the off-site facilities, and AVEK will own facilities within the project site. The estimated cost for the power facilities is about $75 million; however, the majority of the capital will be covered by SCE. Metropolitan's capital cost responsibility for power for the project is approximately $11 million. Metropolitan is also responsible for the facilities' O&M costs (which are estimated to be 3 percent of capital costs) once operational.

Hydraulic Variability

In 2017, in accordance with the original project design, AVEK completed its initial field investigation and drilled five monitoring wells to a depth of approximately 500 feet below ground surface. Shortly after completion, the monitoring wells were tested and sampled. In 2020, AVEK completed an initial groundwater model based on the information collected from the monitoring wells. The model was refined and calibrated to calculate the estimated recharge and recovery capacity. Based on the modeling results, the recovery capacity objective of 70,000 AF-per year could not be met with the original proposed well design of 23 shallow wells. In 2021, AVEK installed and tested four deep pilot recovery wells drilled to approximately 1000 feet. These pilot wells were drilled with the intention of being permanent recovery wells but are referred to as "pilot" since they were the first wells and were used for extensive testing and modeling of the basin. Testing included step and constant rate pumping tests and zonal testing. AVEK also installed a deep piezometer and monitoring well. Based on the depth-specific data collected, AVEK was able to estimate, among other things, the recovery capacity of the wells. Modeling revealed that the annual recovery objectives could be met by drilling deeper wells and increasing the total number of wells by four. The new recovery facilities would include a total of 27 deep aquifer wells. The impacts of increasing the depth and number of recovery wells, including drilling, pumps, motors, instrumentation and SCADA, piping, and well site electrical, results in an increase in costs of about $29 million. It should be noted that this is a conservative approach in design to ensure production of at least 70,000 acre-feet of direct pump-back capacity in a given year. It is possible that this infrastructure may allow for a higher amount of annual pumping or for the full 70,000 acre-feet to be produced in a shorter time window within the year.

Groundwater Quality and Treatment

The initial field investigation in 2017 included Title 22 water quality sampling for the five monitoring wells. In 2018, the monitoring wells were resampled per Metropolitan's request. All water quality samples collected from the monitoring wells met California's Title 22 Drinking Water Standards. The monitoring wells were shallow, based on the initial well design. However, after completing the groundwater modeling described above, water quality testing of the first four deeper recovery wells (pilot recovery wells) revealed that arsenic levels in all four wells were above the MCL of 10 micrograms per liter (µg/L),[1] ranging from 11 to 19 µg/L. Metropolitan's Board adopted policy governing the introduction of new water sources into treated and untreated conveyance facilities requires new water pump-in programs to meet all MCLs in effect at the time and to be modified, if necessary, to meet subsequent, more stringent MCLs. AVEK conducted additional testing and monitoring, including zonal testing and depth-specific sampling, to refine the groundwater model and further study the basin. The groundwater basin is comprised of a shallow and a deep aquifer. Arsenic is naturally occurring and widespread throughout the basin but is more concentrated in the deeper aquifer. AVEK has completed and tested ten of the 27 planned wells. Arsenic levels in nine wells range from 8 to 20 µg/L. Based on the current water quality data, recovered water from the HDWB may require arsenic treatment prior to delivery to the California Aqueduct. Based on performance requirements, project constraints, and cost-effectiveness for large flow rates, AVEK's recommended treatment process is coagulation and sedimentation. The estimated capital cost for the construction of a treatment facility designed to treat the full program's capacity of 70,000 acre-feet per year is $29 million and $4.2 million per year for O&M costs. Metropolitan staff are reviewing this recommendation. A hybrid operation of treating some wells while blending with other untreated wells could be considered.

Additionally, nitrate was detected in both the monitoring wells and recovery wells, although concentrations were below the MCL of 10 milligrams per liter as Nitrogen (mg/L-N). The nitrate concentrations ranged from 6.3 to 7.8 mg/L-N in the shallower monitoring wells and 2.7 to 5.9 mg/L-N in nine deeper recovery wells. Before AVEK introduces its water into the California Aqueduct, the DWR's Facilitation Group (of which Metropolitan is a member) will review AVEK's proposal to evaluate the program's impact on water quality and provide the program's approval recommendations to DWR. Nitrate cannot be removed through the conventional water treatment process at most treatment plants. However, nitrate treatment is not anticipated at this time. As such, the treatment costs for nitrate are not included in the estimated treatment costs discussed above. Staff will continue to monitor if and how nitrate levels change over time in order to determine whether additional treatment for nitrate is warranted in the future.

Inflation

In 2018, AVEK's consultant prepared the original cost estimate for the project. Since then, the unprecedented pandemic resulted in unforeseen challenges to project development, including supply chain issues affecting the ability to acquire materials/equipment coupled with increased material and construction costs. The original estimate assumed an inflation rate of three percent per year. The Construction Cost Index (CCI) between 2018 and 2022 shows a cost increase of about 30 percent over this period. Recent construction bids received are higher than the estimates, consistent with the CCI. The estimated cost increase due to higher-than-anticipated inflation is about $37 million.

Changes to Design and Costs

Metropolitan continues to work with AVEK to search for cost-saving opportunities without compromising project performance. As an example, AVEK's consultant redesigned the recharge facilities based on additional modeling completed in 2021 to maximize the gravity-fed recharge areas and remove pumped recharge facilities. Absent this design change, the recharge facilities' costs would have been about $27 million higher. Furthermore, staff is working with AVEK to potentially extend the term of the agreement by 20 years beyond the end of the original SWP contract (*i.e.*, to 2077) to distribute the costs over a more extended period, thus reducing the project's unit

[1] The California State Water Resources Control Board, Division of Drinking Water (DDW) is currently investigating the technological and economic feasibility of lowering the arsenic MCL below the current California and federal MCL and closer to the Public Health Goal of 0.004 µg/L.

cost. Staff revised the estimated O&M costs of the program to reflect common industry practice of three percent of capital costs and added the estimated annual O&M costs of $4.2 million for the arsenic treatment facility. All O&M costs are assumed to be escalated annually based on the Consumer Price Index. Based on the discussed increases in cost, modification to estimated O&M costs, and assuming AVEK and Metropolitan agree to extend the term of the HDWB Agreement, the estimated unit cost of the program is $565/AF. The table below provides a summary of the capital cost impacts to the program.

Program Component	**Cost Increase**
Power	$11 million
Hydraulic Variability	$29 million
Recharge Basins	($27 million)
Groundwater Quality	$29 million
Inflation	$37 million
Total	**$79 million**

With the changes shown above, the total capital cost of the program has increased to $210 million. The HDWB Agreement includes an option for Metropolitan to downsize the program facilities to meet the authorized amount of $131 million should the capital costs increase. However, if Metropolitan chose to exercise this option and if AVEK constructed additional facilities that Metropolitan did not pay for, the parties may need to negotiate for Metropolitan to access a proportionate share of all program facilities, including recharge, recovery, and storage.

Considerations

Although the changes described above have resulted in increases in the overall costs for the project, there may be opportunities to recover some costs in the future. For example, the turnout to the California Aqueduct and the off-site power distribution system have additional capacity available that can be used in a future expanded phase of the program. These facilities could be used for Metropolitan's benefit or instead, Metropolitan can negotiate reimbursement for those costs, if other participants benefit from the facilities. In addition, the redesign of the recharge basins reduced the amount of land required for the first phase. Because Metropolitan paid for the initial land purchase, Metropolitan can benefit from that land if the program is expanded, or Metropolitan can negotiate with AVEK to be credited for use of facilities and purchased land if Metropolitan chooses not to participate in a future phase. Additionally, the planned facilities are designed to allow at least 70,000 acre-feet of capture and pump-back capacity. It is possible that program performance may exceed these amounts. Metropolitan and AVEK may consider revising the agreement to reflect the potential for higher program performance.

Timeline and Next Steps

Staff will incorporate committee feedback and return to the Board to request authorization for the additional project costs, approval of the final project design including treatment options, and necessary contract amendments, as may be required. In addition, staff will continue to monitor the construction and schedule of the project and provide regular updates to the committee.

Policy

By Minute Item 44357, dated February 13, 2001, the Board authorized adopting a water quality policy governing the introduction of new water sources into treated and untreated conveyance facilities, and authorized the General Manager to implement the policy, as set forth in the letter signed by the General Manager on January 29, 2001.

By Minute Item 50302, dated November 10, 2015, the Board authorized entering into an agreement for Storage and Exchange Programs with AVEK.

By Minute Item 51564, dated April 9, 2019, the Board authorized to enter into an agreement for the High Desert Water Bank Program with AVEK.

Metropolitan Water District Administrative Code Section 4203: Water Transfer Policy

Fiscal Impact

Based on the delineated increases in costs attributed to power, hydraulic variability, groundwater quality, and inflation, the capital costs for the construction of the HDWB Program are estimated to increase by $79 million. Total capital costs are projected to be $210 million with an estimated unit cost of about $565/AF. In the Adopted Biennium Budget for Fiscal Years 2022/23 and 2023/24 (the "Adopted Budget"), the Board approved bond financing for the HDWB Program, which reduces O&M expenditures for this supply program by converting short-term construction cash expenditures to debt service payments over the term of bonds. Staff will propose the issuance of additional bonds to fund the $79 million in increased capital costs. The net fiscal impact of the delayed financing and increased capital costs is negligible (approximately $30,000) during the term of the Adopted Budget. The additional debt financing costs, however, are estimated to increase supply program costs by $112.2 million over the fifteen-year term of the bonds, averaging about $6.5 million per year over prior annual projections.

Brad Coffey 3/4/2023

Brad Coffey *Date*
Manager, Water Resource Management

3/4/2023

Adel Hagekhalil *Date*
General Manager

Ref# wrm12688221

Print Form

Antelope Valley Water Agency
FEB 02 2018
Received

Notice of Determination

Appendix D

To:
☒ Office of Planning and Research
U.S. Mail: P.O. Box 3044, Sacramento, CA 95812-3044
Street Address: 1400 Tenth St., Rm 113, Sacramento, CA 95814

☒ County Clerk
County of: Los Angeles
Address: 12400 Imperial Hwy or PO BOX 1208
Norwalk, CA 90650-1208

From:
Public Agency: Antelope Valley - East Kern Water
Address: 6500 West Avenue N
Palmdale CA 93551
Contact: Dwayne Chisam, General Manager
Phone: 661 943 3201

Lead Agency (if diff
Address:
Contact:
Phone:

THIS NOTICE WAS POSTED
ON December 26 2017
UNTIL January 25 2018
REGISTRAR – RECORDER/COUNTY CLERK

SUBJECT: Filing of Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code.

2017 358096
FILED
Dec 26 2017

State Clearinghouse Number (if submitted to State Clearinghouse): 2017061030

Project Title: High Desert Water Bank

Project Applicant: Antelope Valley - East Kern Water Agency

Project Location (include county): Los Angeles County

Project Description:
The Agency proposes the development and operation of a groundwater bank on approximately 1,500 acres in the western edges of the Antelope Valley. The project would store State Water Project water supplies during wet weather year periods when supplies exceed demands and would recover the water during dry weather years when demands exceed supplies and other times when there are disruptions to State Water Project Supplies. Implementation of this project will require the construction of monitoring and production water wells, turnouts off of the California Aqueduct, underground and above ground pipelines, recharge basins, and water storage and booster pump facilities.

This is to advise that the Antelope Valley - East Kern Water Agency (☒ Lead Agency or ☐ Responsible Agency) has approved the above described project on December 19, 2017 (date) and has made the following determinations regarding the above described project.

1. The project [☐ will ☒ will not] have a significant effect on the environment.
2. ☐ An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA.
   ☒ A Negative Declaration was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation measures [☒ were ☐ were not] made a condition of the approval of the project.
4. A mitigation reporting or monitoring plan [☒ was ☐ was not] adopted for this project.
5. A statement of Overriding Considerations [☐ was ☒ was not] adopted for this project.
6. Findings [☒ were ☐ were not] made pursuant to the provisions of CEQA.

This is to certify that the final EIR with comments and responses and record of project approval, or the negative Declaration, is available to the General Public at:
Lead Agency's office located at 6500 West Avenue N, Palmdale CA 93551

Signature (Public Agency): [signature] FOR DWAYNE CHISAM Title: General Manager

Date: December 19, 2017 Date Received for filing at OPR:

Authority cited: Sections 21083, Public Resources Code.
Reference Section 21000-21174, Public Resources Code.

Revised 2011

ANTELOPE VALLEY–EAST KERN WATER AGENCY
NOTICE OF DETERMINATION
FOR THE ADOPTION OF A
CEQA MITIGATED NEGATIVE DECLARATION
FOR THE
HIGH DESERT WATER BANK

PROJECT TITLE: High Desert Water Bank

LEAD AGENCY: Antelope Valley-East Kern Water Agency (AVEK)

PROJECT SPONSOR: AVEK

PROJECT LOCATION: The Project includes approximately 1,500 acres of land in the unincorporated area of Los Angeles County in portions of Sections 1, 2, 11, and 12 of Township 8 North, Range 17 West, northwest of the community of Neenach and bounded by: Avenue A on the north, 280th St. West on the east, 300th St. West on the west, and the California Aqueduct on the south.

PROJECT DESCRIPTION: The Agency proposes the development and operation of a groundwater bank on approximately 1,500 acres of land in the western edges of the Antelope Valley. The project would store State Water Project water supplies from the Agency and other banking participants during wet weather periods when supplies exceed demands and would recover the water for use by the Agency and its partners during dry weather years when demands exceed supplies and other times when there are disruptions to State Water Project Supplies. Implementation of this project will require the construction of monitoring and production water wells, turnouts off of the California Aqueduct, underground and above ground pipelines, recharge basins, and water storage and booster pump facilities.

FINDINGS:

The Agency finds that the proposed Project WILL NOT have a significant effect on the environment for the following reasons:

1. The proposed Project would not have a significant impact to or as a result of the following resources;

    a. Aesthetics,
    b. Greenhouse Gas Emissions,
    c. Land Use and Planning,
    d. Mineral Resources,
    e. Population and Housing,
    f. Public Services,
    g. Recreation, and
    h. Transportation and Traffic.

2. The proposed project would result in potentially significant impacts to or as a result of the following resources. With proposed mitigation measures in place, the level of impact is lessened to a level which is less than significant.

    a. Agriculture,
    b. Air Quality,
    c. Biological,
    d. Cultural,
    e. Geology and Soils,
    f. Hazards and Hazardous Materials,
    g. Hydrology & Water Quality,

h. Noise,
i. Tribal Cultural Resources, and
j. Utilities and Service Systems.

MITIGATION MEASURES

Implementation of the project specific mitigation measures identified below for the resources described above would reduce all associated potentially significant impacts to below a level of significance.

Agricultural Resources:

AG-1: Prime Farmland Avoidance – The Agency will not perform recharge operations on the 60 acres of semi active farmed Prime Farmland on the northwest corner of the property.

Air Quality:

AQ-1: Minimization Measure for NOx Related Emissions - Construction contractor shall use off road construction diesel engines that meet, at a minimum, the Tier 4 interim California Emissions Standards, unless such an engine is not available for a particular item of equipment. Tier 3 engines will be allowed on a case by case basis when the contractor has documented that no Tier 4 interim equipment, or emissions equivalent retrofit equipment is available for a particular equipment type that must be used to complete construction. Documentation shall consist of signed written statements from at least two construction equipment rental firms.

Biological Resources:

BIO-1 : Burrowing Owls – Prior to ground-disturbing activities and other habitat disturbance, clearance surveys for active burrowing owl burrows shall be conducted of all areas subject to disturbance. Prior to ground-disturbance associated with construction of the Project, including vegetation clearance and grubbing, preconstruction clearance surveys shall be conducted by a qualified biologist within the Project site and a 500-foot buffer of the site in order to locate active burrowing owl burrows. Pre-construction clearance surveys shall be conducted no more than two (2) weeks prior to construction. Surveys will be conducted following guidelines provided in the *Staff Report on Burrowing Owl Mitigation* (CDFW 2012).

Within two (2) weeks prior to inundation, trained AVEK personnel shall review all areas subject to inundation for presence of burrows with entrances suitable for burrowing owl occupation and potential burrowing owl sign. Any identified potentially occupied burrows will be investigated further by a qualified biologist prior to inundation. Training will be conducted by a qualified biologist for AVEK personnel who conduct pre-inundation surveys prior to the commencement of the first inundation survey. Training will discuss burrowing owl identification and sign and burrow recognition, their status, and the laws governing their protection. Training will be conducted by a qualified biologist on an annual basis for all Project operations personnel as a refresher.

If no burrowing owls are detected, no further mitigation will be required. If burrowing owls are observed during any survey, the following measures will be implemented:

- Occupied burrows will not be disturbed during the nesting season (April 1 through October 15).
- Occupied burrows will not be subject to inundation during operation of the water bank.
- Avoidance shall be the preferred approach for occupied burrows whenever feasible. If occupied burrows are observed during the non-breeding season (October 16 through March 31), a 160-foot buffer will be established; no construction or other physical work activities will occur within the

buffer. If occupied burrows are observed during the breeding season (April 1 through October 15), a 650-foot buffer shall be established; no construction or other physical work activities will occur within the buffer.

- When destruction of occupied burrows is unavoidable, destruction shall occur only during the non-nesting season (October 16 through March 31). Prior to destruction of occupied burrows within the Project site, any unsuitable burrows outside the disturbance footprint will be enhanced (enlarged, cleared of debris) to facilitate occupation.
- If owls must be moved away from the Project area, passive relocation techniques (e.g., installation of one-way exclusion doors at burrow entrances) will be used instead of trapping. A Passive relocation techniques will be employed for a minimum of one week in order to allow owls to acclimate to alternate burrows.

In order to provide protections for burrowing owls throughout construction and operations of the Project, a Burrowing Owl Protection Plan shall be developed prior to construction of the recharge basins. This plan will provide acceptable strategies for avoiding and minimizing impacts to burrowing owls and burrowing owl habitat on the Project site.

BIO-2 : Desert Kit Fox and American Badger – Clearance surveys for occupied desert kit fox and American badger dens shall be conducted prior to any Project disturbance activities, including initial construction and ongoing operations such as inundation of the recharge basins.

Within two (2) weeks prior to the start of construction, a qualified biologist shall conduct pre-construction clearance surveys of the work area and a 150-foot buffer for signs of desert kit fox and American badger, including active and inactive natal and non-natal dens, scat, prey remains, and tracks. All suitable denning locations shall be investigated for use.

Within two (2) weeks prior to inundation of the basins, trained AVEK personnel shall review all areas subject to inundation for potential sign of American badger or desert kit fox, including active and inactive natal and non-natal dens. Any identified potential sign of presence will be investigated further by a qualified biologist prior to inundation. Training will be conducted by a qualified biologist for AVEK personnel who conduct pre-inundation surveys prior to the commencement of the first inundation survey. Training will discuss American badger and desert kit fox identification and sign and den recognition, their status, and the laws governing their protection. Training will be conducted by a qualified biologist on an annual basis for all Project operations personnel as a refresher.

If dens are observed, the following measures will be implemented:

- Occupied dens will not be subject to inundation during operation of the water bank.
- Inactive dens shall be excavated by hand with a shovel to prevent badgers/kit foxes from re-using dens during construction.
- If active natal dens are observed during the survey, a buffer of 300 feet shall be established around the den; no construction or work activities will occur within the buffer. The den shall be monitored and the buffer maintained until a qualified biologist has determined that the den is no longer active, at which time it shall be excavated by hand to prevent re-use. Passive relocation of American badger and desert kit fox shall not take place while young are still in dens and dependent on the parents for food, or while females may be pregnant.
- If active, non-natal dens are observed within the Project site or buffer, badgers/kit foxes shall be discouraged from using these dens prior to clearing, grubbing, and/or grading of the site, by partially blocking the entrance of the den with sticks, debris, and soil for 3 to 5 days. Access to the den shall be incrementally blocked to a greater degree over this period, encouraging the badger/kit fox to vacate the den of its own volition. After badgers/kit foxes have stopped using active dens within the Project boundary, the dens shall be hand-excavated with a shovel to prevent re-use.

- If newly active badger/kit fox dens are found during construction activities, all work in the area shall cease until the biologist can safely close the den.
- If a desert kit fox or American badger is encountered during Project activities, all work that could result in a direct injury, disturbance, or harassment shall immediately stop and the Project biologist shall be notified.
- Where desert kit foxes have the potential to occur, all heavy equipment and vehicles left on-site overnight will be inspected at the beginning of each work day to verify that no individuals have taken shelter under the equipment. If a desert kit fox is observed, the project biologist shall be notified and the animal shall be observed from a distance until it has moved out of the area of its own accord.

BIO-3 : Nesting Birds - If construction activities occur within the breeding bird season (February 1 through September 15), all vegetation clearing and initial ground disturbing activities will be preceded by a nesting bird survey. Nesting bird surveys will be conducted by a qualified biologist of all areas that may support nesting and will be subject to disturbance, as well as a 300-foot buffer for passerine species and 500-foot buffer for raptors. Surveys will be conducted no more than 7 days prior to construction activities.

- If an active nest is observed, a no-disturbance buffer will be established until a qualified biologist has determined the nest has either failed or has successfully fledged and the young are no longer dependent on the nest. The no-disturbance buffer will measure no less than 500 feet for raptors, and 300 feet for all other species.

BIO-4 : Animal Movement and Entrapment (Trenches) - All trenches that are to be left open overnight shall be either securely covered or have wildlife escape ramps installed during non-work hours to prevent entrapment of common and special-status wildlife species. All steep-walled pipeline and utility trenches shall be inspected in the mornings and prior to backfilling to prevent mortality of common and special-status wildlife species. All entrapped wildlife shall be removed or allowed to escape voluntarily via escape ramps prior to construction resuming.

BIO-5 : Animal Movement and Entrapment (Pipes) – All pipes, culverts, or similar structures on-site with a diameter of 2 to 24 inches shall be inspected for special-status species prior to moving or welding. Openings shall be capped or otherwise covered if sections cannot be inspected to prevent the entry and potential loss of wildlife. If a common or special-status species is discovered inside a pipe, the animal shall be safely removed by a qualified biologist. The pipe segment shall not be moved until the animal has escaped, or the pipe segment shall be moved a single time out of the path of construction. Alternatively, stored pipe may be kept capped at all times until used during construction. Vertical, open-ended pipes used as fence posts, property line demarcations, sign posts, etc., will be capped or otherwise plugged to prevent the entrapment and possible injury and mortality of wildlife.

BIO-6 : Erosion and Sediment Control - Best available erosion and sediment control measures will be employed to prevent downstream dispersal of sediments during and following Project-related activities. These measures may include sediment basins, gravel bags, silt fences, geo-bags, or gravel and geotextile fabric berms, erosion control blankets, coir rolls, jute net, and straw bales. The use of erosion control materials potentially harmful to wildlife species, including monofilament netting (erosion control matting) or similar material, will not be employed.

BIO-7 : Special-Status Plants - Prior to construction of the recharge basins, floristic surveys shall be conducted of all potentially suitable habitats on the Project site. Floristic surveys shall be conducted by a qualified biologist following CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW 2009). If no special-status plants are observed, no further mitigation will be necessary. If special-status plants are observed during surveys,

the following measures will be implemented:

- Individuals will be protected in place to the extent feasible through implementation of avoidance and buffers.
- If special-status plant individuals or populations must be impacted, individuals will be salvaged and/or transplanted to suitable habitat within the established on-site habitat management lands. If salvage is not feasible, mitigation at a 2:1 ratio will be provided within habitat management lands. In the case of annual species, top soil salvage may be employed to preserve the existing seed bank where appropriate enhancement of existing populations may be employed at the same 2:1 ratio.

BIO-8 : Swainson's Hawk - Prior to construction of the recharge basins, focused Swainson's hawk surveys shall be conducted. Surveys for Swainson's hawk shall be conducted by a qualified biologist following the methods outlined in Swainson's Hawk Survey Protocols, Impact Avoidance, and Minimization Measures for Renewable Energy Projects in the Antelope Valley of Los Angeles and Kern Counties, California (CDFW 2010). Surveys shall include all potential Swainson's hawk nesting habitat within a 5 mile radius of the Project site. Surveys shall include all potential nest trees, towers or other potential nest sites (including nests used within the last 5 years) outside the nesting season for Swainson's hawk.

If no active Swainson's nests are observed, no further mitigation will be necessary. If an active Swainson's hawk nest is detected during focused surveys, the following measures will be implemented:

- No removal of active Swainson's hawk nests will be conducted during Project construction and/or operations.
- No construction activities will be conducted within a 0.5-mile radius of an active Swainson's hawk nest. Prior to construction activities, a qualified biologist will conduct a focused Swainson's hawk nest survey within an up to 0.75-mile radius of proposed construction activities to identify any active nests.
- If active Swainson's hawks nests are identified within a 0.5-mile radius of the Project site, a Habitat Management Plan will include specific, detailed measures to avoid and minimize impacts to Swainson's hawks in or near the Project site during both construction and operation of the Project.

BIO-9 : Tri-colored Blackbirds - While the Initial Study indicates that impacts to tricolored blackbird foraging habitat due to Project-related activities are less than significant, at the request of the CDFW focused nesting season surveys will be conducted as follows: Prior to construction of the recharge basins, focused nesting tri-colored blackbird surveys shall be conducted of all potentially suitable nesting habitats and documented nesting colonies within the Project site and within a 3-mile radius of the Project site for any active nesting colonies.

BIO-10 : Jurisdictional Drainages and Wetlands - Prior to construction of the recharge basins or any ground-disturbing activities within waterways and wetlands on the site, a formal Jurisdictional Delineation will be conducted of all potential jurisdictional waters within the Project site. Fill or disturbance of any jurisdictional waters or wetlands will be permitted through the appropriate agency (i.e., Sections 401 and 404 of Clean Waters Act, or Section 1600 of California Fish and Game Code). Impacts to jurisdictional waters and wetlands will be avoided to the extent feasible, and shall not occur prior to issuance of any required local, state, and federal permits.

BIO-11 : Habitat Mitigation - AVEK will designate a significant allotment of land as habitat management lands. The purpose of these areas is to provide foraging habitat for Swainson's hawk, tricolored blackbird, nesting and foraging habitat for burrowing owl, and denning and foraging habitat for desert kit fox and American badger. The details of the management of these lands shall be described in a *Habitat Management Plan* to be prepared prior to construction of the recharge basins.

BIO-12 : General Biological Measures –

Worker Environmental Awareness Training - Prior to construction, a Worker Environmental Awareness Training shall be prepared and presented by a qualified biologist to all construction personnel at the start of Project-related activities. The training shall discuss sensitive-status species with the potential to occur within the Project footprint, including their regulatory status, description, and habitat requirements, and any sensitive habitat areas that may be encountered. The program shall emphasize the importance of minimizing disturbance, and describe the federal, state, and local regulations protecting biological resources and the potential penalties for non-compliance with these laws and statutes.

Equipment Staging - All construction equipment, staging areas, materials and personnel shall be restricted to existing roadways and road shoulders, designated work areas, or previously disturbed off-site areas that are not habitat for special-status species.

Site Cleanliness - All trash and food items shall be contained and removed from the site regularly to prevent attracting predators and scavengers, such as dogs, coyotes, desert kit fox, or common ravens, to the Project area.

Hazardous Waste Cleanup - Any spills of petroleum products or other chemicals, which may represent a hazard to wildlife, shall be cleaned up promptly and in accordance with appropriate laws and regulations.

Cultural Resources:

CR-1: Cultural Resources Monitoring – The Project site has been identified to have a low to moderate potential of finding significant archaeological resources lacking surface manifestations that may be encountered during Project construction. To lessen the impact of unknown archeological resources, the Agency will develop a Cultural Resources Monitoring and Mitigation Plan prior to start of ground disturbance. This plan will implement part time monitoring by a qualified archeologist and or a Native American Monitor. In the event that project construction activities result in a finding of significant importance, the qualified archeologist may increase the level of monitoring. If no findings occur during the part time monitoring, the archeologist may further reduce or eliminate the monitoring. During a find of a potentially significant archaeological resource, the resource will be inventoried and evaluated to ascertain whether the resource meets the criteria for listing on the California Register of Historical Resources. After the discovery, all work being conducted within the vicinity of the discovery will be halted or diverted away from the site of discovery until a qualified archaeologist can assess the potential significance of the find.

CR-2: Regulation Compliance – The Agency will comply with Health and Safety Code Section 7050.5, CEQA Section 15064.S(e), and Public Resources Code Section 5097.98, which mandate the process to be followed in the unlikely event of an accidental discovery of any human remains in a location other than a dedicated cemetery.

Geology and Soils:

GEO-1: SWPPP - To control water and wind erosion during construction and operation of the Project, the Agency will prepare a Stormwater Pollution Prevention Plan (SWPPP) in compliance with the requirements of the National Pollutant Discharge Elimination System (NPDES) Construction General Permit.

GEO-2: Seismic Design - Although the proposed Project has little inherent potential for causing seismic safety effects, the Agency will ensure that all facilities are designed to withstand the anticipated seismic forces, consistent with local and State building codes and relevant regulations.

GEO-3: Pipeline Shut Off Valves - The Agency will install shut off valves on major pipelines to minimize the potential for flooding during seismic events.

GEO-4: Groundwater Monitoring Plan - Although the potential for the Project to raise groundwater levels to within 30 to 50 feet of the ground surface is small, to address potential impacts to local groundwater levels, the Agency will develop a monitoring program to monitor changes in water levels in the area affected by groundwater recharge operations. If monitoring identifies groundwater level rise to 75 feet below ground surface, the Agency will modify management of recharge to prevent water levels from rising to levels where liquefaction effects could occur. The Groundwater Monitoring Plan will also include provisions for monitoring of groundwater quality and the development of a native groundwater quality baseline which would be identified prior to commencement of recharge operations.

Hazards and Hazardous Materials:

HAZ-1: Spill Prevention Plan - Consistent with Agency's existing practices, the Agency will require from its construction contractors the preparation and implementation of a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities and operations. The plan and methods shall be in conformance with all State and Federal regulations. The Agency shall provide for routine inspection of the construction and operations areas to verify that the measures specified in the SPCCP are properly implemented and maintained and further ensure that contractors are notified immediately if there is a noncompliance issue and will require compliance.

HAZ-2 : Bird Strike Hazard Notification - The Agency will notify the Flight Safety Office at Edwards Air Force Base and all local airports of the potential bird strike hazard as follows:

- Prior to application of water to the recharge basins, and
- If large birds or large concentrations of small birds are observed in or near the recharge area.

HAZ-3: Bird Strike Hazard Minimization Measures - The Agency will implement actions to reduce the attractiveness of the recharge basins to birds by:

- Use of recharge basins with shallow water depths which will be generally unsuitable for the larger migratory birds,
- Monitor recharge area water and if aquatic macroinvertebrates are found to be developing in large numbers and/or foraging by shorebirds is observed, temporarily dry out recharge areas, thereby reducing the insect and aquatic macroinvertebrate forage that would attract and hold shorebirds.
- Whenever water is present in the recharge basins, the project operator will monitor the basins daily for bird activity and if found discourage their use via means acceptable to the Department of Fish and Wildlife.

HAZ-4: Mosquito Borne Disease Minimization Measures – The Agency will consult with the Antelope Valley Mosquito and Vector Control District to develop and implement a mosquito management plan. The plan would consist of a Project specific mosquito abatement program that would include quantitative abatement thresholds. The Agency and/or its representative would monitor mosquito larvae production in the recharge basins, drainages, and distribution. Larvae populations would be tracked using methods and thresholds approved by the Mosquito Abatement District, and suppression measures would be employed when thresholds are exceeded. The primacy mode of suppression would be to monitor for mosquito

presence and if mosquito larvae are found, to cycle recharge temporarily so that units of recharge would be dried.

Hydrology and Water Quality:

HWQ-1: Drainage Design - Recharge areas will be constructed so that they will not divert sheet flooding and other runoff away from the recharge areas. This will allow flood water to flow into the recharge areas where flows will be somewhat retarded by the recharge berms. Berms will be designed with berm heights below the calculated flood depth elevations and intended to be sacrificial. Flood flows would enter the site, go through the berms, overtop or destroy the berms in sequence, and eventually exit the project site along the eastern boundary of the proposed project in a manner similar to pre-project conditions.

HWQ-2: Stormwater Pollution Prevention Plan (SWPPP) - To reduce or eliminate Construction related water quality effects, before onset of any construction activities, the Agency or its contractor will prepare a Storm Water Pollution Prevention Plan. The SWPPP will include temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover). These measures will be employed to control erosion from disturbed areas. Measures for the control of pollutants during construction include:

- Use of existing access points to minimize dust and tracking materials onto Public Streets,
- Designated Parking, Storage, and Service Areas protected by silt fence and oil absorbents and sloped to control drainage,
- Minimize diesel storage,
- Stockpile spill cleanup materials,
- Regular vehicle inspection for leaks.
- Fuel off-channel with a secondary containment system for spills,
- Use quick connects whenever possible,
- Fueling by authorized personnel only, and
- Spill cleanup materials readily available.

The SWPPP shall include a Fugitive Dust Control Plan (FDCP) that will include extensive measures to control and manage soil erosion. The FDCP will provide for management of open soils that will contribute to management of runoff.

Consistent with the SWPPP and the Agency's current construction management practices, the Agency or its agent will perform routine inspections of the construction area to verify that the BMPs specified in the SWPPP are properly implemented and maintained. The Agency will notify its contractors immediately if there is a noncompliance issue and will require compliance.

HWQ-3: Spill Prevention Plan - Consistent with Agency's existing practices, the Agency will require from its construction contractors the preparation and implementation of a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities and operations. The plan and methods shall be in conformance with all State and Federal regulations. The Agency shall provide for routine inspection of the construction and operations areas to verify that the measures specified in the SPCCP are properly implemented and maintained and further ensure that contractors are notified immediately if there is a noncompliance issue and will require compliance.

HWQ-4: Protection of Off Site Wells. To address potential impacts to groundwater and adjacent well owners, the Agency will develop a monitoring program to monitor changes in water levels and well production in the area affected by groundwater recharge operations. The program will specify that:

- Extractions of groundwater shall not exceed 90% of the amount of water recharged,
- Water quality in recovered water and in groundwater flowing away from the Project will be monitored to ensure that water quality remains appropriate for designated beneficial uses,
- During recharge operations, water levels will be monitored and recharge operations will be suspended in the event that offsite water levels rise to within 75 feet of the ground surface, and
- During recovery operations, water levels in offsite wells will be monitored and operations will be adjusted if offsite wells are found to be adversely affected by project operations,

HWQ-5: Management of Herbicides and Pesticides - The Agency will comply with all regulations of the California Department of Pesticide Regulation regarding the use of herbicides and pesticides in areas designated for groundwater recharge.

Noise:

NOISE-1: Construction Noise Monitoring and Minimization Measures – The Agency and its construction contractors will monitor noise levels for construction activities near and along 280th Street West corresponding to the eastern boundary of the proposed Project area which includes potential noise receptors (residential homes). In the event that noise levels exceed the County of Los Angeles designated thresholds, the construction contractor will implement noise reduction measures to include:

- Providing construction equipment with sound control devices.
- With the exception of well drilling operations, restrict construction activities to day time hours.
- In the event that construction activities occur close to sensitive noise receptors, implementing appropriate additional noise mitigation measures, including but not limited to:
    - Changing the location of stationary construction equipment,
    - Shutting off idling equipment,
    - Rescheduling construction activity
    - Notifying adjacent residents in advance of construction work, and
    - Installing acoustic barriers around stationary construction noise sources.

NOISE-2: Operation Noise Minimization Measures – The Agency proposes to construct approximately 7 groundwater wells in the vicinity of 280th St. West which have the potential to increase the ambient noise level for the nearby residential homes on the east side of 280th St. West during groundwater recovery operations. The Agency proposes to equip these wells with insulated well enclosures that will reduce the operational noise level in the area to less than significant.

Tribal Cultural Resources:

TCR-1: Inadvertent Finds –

1. If human remains or funerary objects are encountered during any activities associated with the project, work in the immediate vicinity (within a 100-foot buffer of the find) shall cease and the County Coroner shall be contacted pursuant to State Health and Safety Code §7050.5 and that code enforced for the duration of the project.

2. In the event that Native American cultural resources are discovered during project activities, all work in the immediate vicinity of the find (within a 60-foot buffer) shall cease and a qualified archaeologist

meeting Secretary of Interior standards shall be hired to assess the find. Work on the other portions of the project outside of the buffered area may continue during this assessment period. Additionally, San Manuel Band of Mission Indians will be contacted if any such find occurs and be provided information and permitted/invited to perform a site visit when the archaeologist makes his/her assessment, so as to provide Tribal input.

3. If significant Native American historical resources, as defined by CEQA (as amended, 2015), are discovered and avoidance cannot be ensured, an SOI-qualified archaeologist shall be retained to develop an cultural resources Treatment Plan, as well as a Discovery and Monitoring Plan, the drafts of which shall be provided to San Manuel Band of Mission Indians for review and comment.

a. All in-field investigations, assessments, and/or data recovery enacted pursuant to the finalized Treatment Plan shall be monitored by a San Manuel Band of Mission Indians Tribal Participant(s).
b. The Lead Agency and/or applicant shall, in good faith, consult with San Manuel Band of Mission Indians on the disposition and treatment of any artifacts or other cultural materials encountered during the project.

Utilities:

UTIL-1: Electrical Service Upgrade Minimization Measures – In the event that the existing electrical grid system needs to be expanded to meet the proposed project demands, the Agency will require that the Electric Company comply with all mitigation measures identified in this Initial Study during the construction of the expansion.

INITIAL STUDY: The Initial Study prepared for this Project is included by reference as a part of this Notice of Determination to adopt a Mitigated Negative Declaration.

Mitigation Monitoring and Reporting Program: The Mitigation Monitoring and Reporting Program prepared for this Project is included by reference as a part of this Notice of Determination to adopt a Mitigated Negative Declaration.

DETERMINATION: The Antelope Valley – East Kern Water Agency as Lead Agency has completed an Initial Study evaluating the possible environmental effects of the above referenced project in accordance with the California Environmental Quality Act (CEQA) guidelines and has determined that a Mitigated Negative Declaration is appropriate. The Lead Agency has reviewed comments submitted by the public during the public review period and has incorporated revisions to the Initial Study and Mitigated Negative Declaration which address said comments.

The Lead Agency hereby finds that the proposed project as described and proposed to be mitigated in the project's Mitigation Monitoring and Reporting Program will not have a significant effect on the environment. This determination has been made according to CEQA guidelines. Said finding and subsequent Notice of Determination filing was approved by the Board of Directors of the Antelope Valley – East Kern Water Agency during their Regular Board Meeting of December 19, 2017.

Dwayne Chisam, P.E., General Manager
Antelope Valley-East Kern Water Agency

DWAYNE CHISAM 12/20/17

Signature **Date**

Antelope Valley – East Kern Water Agency

High Desert Water Bank
California Environmental Quality Act (CEQA)
Initial Study

December 2017

AECOM

This final version of the Initial Study has been revised to address comments issued during the public review period. Significant revisions have been identified by underlined text.

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SECTION 1
PROJECT DESCRIPTION

1.1 Location

The Antelope Valley – East Kern Water Agency (AVEK or Agency) proposes to build and operate a groundwater recharge and recovery program referenced as the High Desert Water Bank (the Project). The Project will be implemented on an approximately 1,500 acre site in Los Angeles County bounded by:

- Avenue A (Kern / Los Angeles County Line) on the north,
- 300th Street West on the west,
- 280th Street West on the East, and
- The California Aqueduct on the south.

This area is located in Sections 1, 2, 11, and 12 of Township 8 North, Range 17 West, northwest of the community of Neenach. Refer to Figures 1A and 1B in Appendix A for the Project location.

The Project area consists of undeveloped and fallowed agricultural land surrounded by the Tehachapi and San Gabriel mountain ranges to the north, south, and west. With the exception of some isolated residential homes within and to the east of the Project area, the nearest residential communities are located ½ mile south and 2 miles east of the Project area. The Project's southern boundary is the California Aqueduct which is the backbone of the State of California's State Water Project (SWP). The California Aqueduct will be the source of water for recharge operations and the point of delivery for return flow operations for the Project. The Project area is also situated south of an existing groundwater bank owned and operated by another Agency. The slope of the land generally falls to the east with an approximately 50-ft drop over a 2 mile section.

1.2 Capacity

Feasibility of the Project was evaluated by the Agency's consultant West Water Research LLC under the Financial Feasibility Assessment of Developing Enterprise Water Bank Capacity at the Far West Site dated March 2017. Based on this assessment, the Agency proposes the implementation of a 280,000 acre foot capacity groundwater bank that will store SWP water from various State Water Contractors and other partnering agencies throughout the State of California including the Agency. The Project proposes to store approximately 70,000 acre foot per year of SWP surface water conveyed to the site via the California Aqueduct. Recharge operations are planned during wet weather years when SWP allocations exceed demands. The Agency then proposes to recover 90% of the stored water with up to an estimated 70,000 acre feet per year returned during dry and critical weather years when SWP allocations are low or disrupted. The Project would allow the Agency and its partners to rely primarily on the groundwater bank as their primary source of water during dry weather years.

1.3 Operations

1.3.1 Recharge

The Agency proposes to conduct recharge operations year round in wet weather years when SWP water is available. Water for recharge operations is anticipated to be from the Agency and its partner's SWP allocations. Recharge may be accomplished using three methods. In the first method, water may be spread over the property by flooding, similar to agricultural operations where contour flooding is used with shallow low earthen berms. Refer to Figure 2 in Appendix A for a typical schematic of the proposed low berm recharge areas. This schematic is intended to show the general concept. Actual recharge basin

layouts may change after further design of the Project. The second method includes center pivot water application facilities in which a center pivot irrigation system would be used to apply water along the surface similar to a row crop irrigation system. The third method includes the construction of engineered basins where water would be deposited for recharge in basins varying in depth from 5 to 10 feet. Given some environmental constraints (Project Sitting in a Flood Zone - Refer to Section 2.10), the preferred method for recharge operations would be the flooding method with low earthen berms about 3 feet in height. The Agency proposes to conduct groundwater level monitoring to minimize impacts associated with the rises in groundwater levels with the use of 5 monitoring wells proposed to be constructed as part of this Project and other existing wells within the Project site. Refer to Figures 3 and 12 in Appendix A for a map of the proposed monitoring wells and existing wells, respectively.

Due to some concerns over the operations of the Aqueduct with the proposed added demand, the Agency will work with DWR in order for this added flow to be delivered. In such a demand condition, DWR will need to have the Alamo Powerplant or the Cottonwood Chute Bypass in operation in order to balance the water demand in the aqueduct without exceeding the 2 ft per day aqueduct level drawdaown criteria. The added demand condition will not be able to be met by DWR if either the Alamo Powerplant and or the Cottonwood Chutte Bypass are out of service. During operation of the bank, the Agency will submit daily water demand forcasts to DWR. In addition during construction of the turnouts, the Agency will include provisions for DWR to have SCADA control ofver the facilities for monitoring and shutdown control.

1.3.2 Recovery

The Agency proposes to conduct recovery operations year round during dry weather years or at any other times when the Agency's groundwater banking participants call for water stored at the Project site to be recovered and delivered to the requesting partner. Recovery operations will be accomplished with the use of groundwater extraction wells that will deliver the recovered water back to the California Aqueduct.

Extraction wells would have an estimated power use range of 0 to 2,720,000 kW-hrs per year. The booster station would have an estimated power use range of 0 to 2,380,000 kW-hrs per year. During wet years with recharge operations, the power usage will be zero. During dry years with recovery operations, wells and pump station may be running continuously.

Operation of the bank would require one full time operator and assistant on site. The operator and assistant would travel daily with an assumed light duty (250 hp) pickup truck, 100 miles per day for operations. There would also be the need for additional staff to assist with berm construction and pipe relocations operations on a periodic basis. This crew is anticipated to travel in one light duty (250 hp) pickup truck with trailer, 100 miles per day, 5 days every four months.

1.3.3 Conservation

The Agency proposes to leave approximately 322 acres of the 1,500 acre Project site for conservation / habitat management land purposes. This in an effort to minimize potential impacts to biological resources including plant and wildlife species as well as wetlands and drainages. Refer to Figure 13 for a schematic of the land proposed for conservation.

1.4 Facilities

1.4.1 Recharge

Water for recharge operations will be conveyed from the California Aqueduct adjacent to the Project site and distributed to the recharge areas via a new 150 CFS capacity turnout and an existing 50 CFS capacity turnout. The existing turnout will be rehabilitated as part of this Project. From the Aqueduct turnouts, water will be conveyed to the different areas of the site with an approximately 3.5 mile

combination / bi directional recharge and recovery transmission pipeline (Main) ranging in size from 36-inch to 70-inch in diameter. This Main will be constructed with a number of aboveground turnouts that will serve as the point of connection to approximately 8 miles of temporary aboveground piping ranging in size from 12-inch to 48-inch in diameter. Aboveground piping will initially be installed throughout the initial berm construction area and then relocated throughout the remainder of the site as needed to deliver recharge water to the various low earthen berm recharge basins. Given the proposed recharge operations of 70,000 acre feet per year (year round) and an assumed recharge infiltration rate of ½-foot per day, the Agency would need to construct roughly 400 acres of recharge basins. Given that recharge efficiencies are anticipated to decrease over time, the Agency proposes to build recharge basins on roughly 1,200 out of the 1,500 acre site as recharge operations will be cycled throughout the site to maintain recharge efficiencies. Refer to Figures 3, 14, 15, and 16 in Appendix A for a schematic layout of the proposed Project facilities. Note that these facilities and their locations are preliminary in nature and are subject to revision during final design. The environmental evaluations in this document are performed so as to cover worst case conditions.

1.4.2 Recovery

The Agency proposes to recover 90% of the banked water at an approximate rate of 70,000 acre feet per year. Assuming individual wells can produce a yield of 2,500 gallons per minute, the Agency proposes to construct an estimated 18 groundwater extraction wells. Recovered water from the bank would be collected in a centralized location where a new booster pump station (100 CFS capacity) and storage tank (250,000 gallons) would be built to return the banked water back to the California Aqueduct. Recovered water will be collected via approximately 6 miles of well collection pipelines ranging in size from 12-inch to 48-inch in diameter and then connected to the combination / bi directional Main described in Section 1.4.1. Refer to Figures 3, 14, 15 and 16 in Appendix A for a schematic layout of the proposed Project facilities. Please note that these facilities and their locations are preliminary in nature and are subject to change after final design.

1.5 Construction

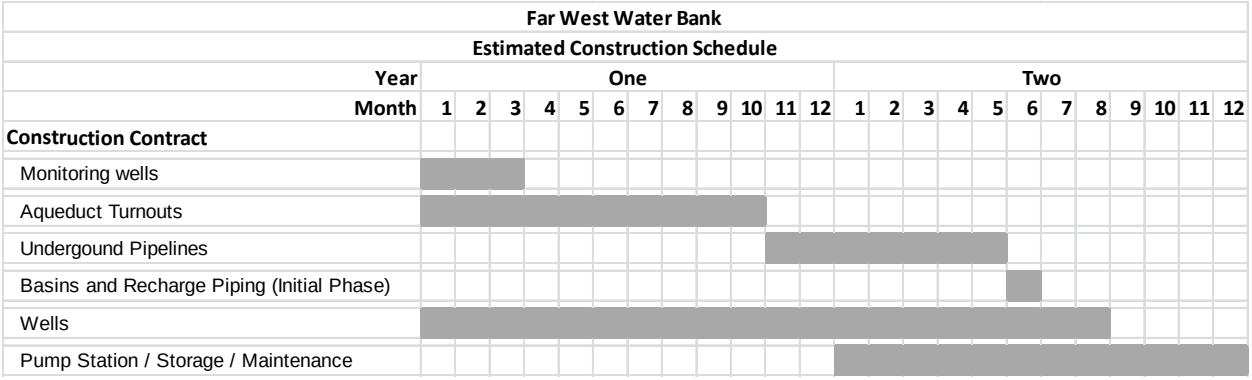
As described in previous sections of this study, implementation of this Project would require the construction of the following facilities;

- Rehabilitation of an existing turnout and 1 new turnout off the California Aqueduct (50 CFS and 150 CFS capacity, respectively),
- 1,200 acres of recharge basins,
- 3.5 mile bi-directional recharge and recovery transmission main ranging in size from 36-inch to 70-inch in diameter,
- 8 miles of aboveground recharge pipelines ranging in size from 12-inch to 48-inch in diameter,
- 6 miles of well collection pipelines ranging in size from 12-inch to 48-inch in diameter,
- An estimated 18 groundwater extraction wells (estimated capacity of 2,500 gallon per minute each),
- 5 monitoring wells, and
- 1 booster pump station (100 CFS capacity) and associated water storage tank (250,000 gallon capacity) and maintenance facilities.

Construction operations would be accomplished under an anticipated six different contracts that include;

- Monitoring wells,
- Aqueduct turnouts,
- Bi-directional recharge/extraction transmission main and well collection pipelines,
- Recharge basin and aboveground piping,
- Groundwater extraction wells, and
- Booster pump station, storage, and maintenance facilities.

Construction operations for these facilities are anticipated to be continuous for a period of approximately 2 years as estimated in the following schedule.



A more detailed description of the anticipated construction activities follows.

1.5.1 Monitoring Wells

Currently, the site has about 10 existing wells that the Agency can utilize to monitor the groundwater level. The majority of these wells are inactive. The active wells would continue to operate under existing conditions. The Agency does not anticipate changing the use of these wells.

The Agency proposes to construct 5 monitoring wells. These wells will be drilled approximately 500 feet deep and constructed with 5-inch well casing. Work for these wells is anticipated to take about 12 weeks. Construction operations include grading to level a 40 x 40 foot drilling pad area, a standard drilling rig on site, a sand-bagged area to receive drilling spoil and reduce runoff, and grading equipment to spread the wet drilling spoil. A typical well may yield about 10 cubic yards of drilling spoil, which will be spread on site over an area of about 0.02 acres. After completion, these wells will be sampled and tested to determine local groundwater quality and the specific yield of the well.

Typical construction equipment will include;

- 1 drilling rig (500 HP, 8 hrs per day for 20 days).
- 1 small roller compactor (114 hp, 1 hour per day)
- 1 skip loader (88 hp, 1 hour per day)
- 1 wheeled loader (313 hp; 1 hour per day)
- 1 water truck (200 hp, 1 hour per day)
- Test pump (10 hp, 12 hrs per well)

1.5.2 Aqueduct Turnouts

The Agency proposes to construct a turnout off of the California Aqueduct. This turnout will be designed to operate via gravity flow. The Agency will also rehabilitate an existing turnout intended to be supplementary to the new turnout. Construction operations will be located on the southwestern and southeastern boundary of the Project site and is anticipated to disturb about 6 acres of land. Refer to Figures 14 and 15 in Appendix A. Construction operations will include installation of the turnout bay within the Aqueduct, underground piping, a metering building, and all associated electrical, mechanical, and instrumentation equipment. Earthwork for this phase of construction is estimated at 250 cubic yards with no import or export material anticipated. Construction operations are anticipated to last about 10 months.

Typical construction equipment will include;

- 1 crane (190 hp, 6 hours per day)
- 1 hydraulic excavator (180 hp, 6 hours per day)
- 1 backhoe (108 hp, 5 hours per day)
- 1 roller compactor (114 hp, 4 hours per day)
- 1 wheeled loader (165 hp, 6 hour per day)
- 1 water truck (200 hp, 4 hours per day)

1.5.3 Underground Pipelines

The Agency proposes to construct approximately 9.5 miles of underground pipelines. Pipe will be laid in a trench about 6 to11 feet deep at the bottom (4-foot pipe cover), with side slopes of about 1.5 to1 for trench safety and stability, or vertical sides if properly shored. Given an average bottom width of 6 feet, the width of the trench at ground level would not be more than about 20 feet. Excavation would involve removal of about 100 cubic feet of soil per linear foot of trench. A stockpile would be maintained along the pipeline alignment. Pipeline may be installed at a rate of about 400 feet per day. The daily work area would be approximately 500 feet long by 60 feet wide, although not all of this area would be disturbed continuously. Excess spoil from excavation operations may be used to provide a low exterior berm along the Project site or spread over the construction area and thus will not be hauled off site. Earthwork for this phase of construction is estimated at 1,200 cubic yards. Pipeline installation operations are estimated to take place over a period of about 7 months.

Typical underground pipeline construction equipment will include;

- 1 crane (190 hp, 2 hours per day)
- 1 hydraulic excavator (180 hp, 6 hours per day)
- 1 grader (174 hp, 6 hours per day)
- 1 off-highway truck (479 hp, 4 hours per day)
- 2 water trucks (200 hp, 4 hours per day)
- 1 belly scraper (313 hp, 4 hours per day)
- 2 wheeled loaders (165 hp, 8 hours per day)
- 1 skip loader (88 hp, 3 hours per day)
- 2 backhoes (108 hp, 5 hours per day)

1.5.4 Recharge Basins and Aboveground Pipelines

The Agency proposes to construct low earthen berms that will be placed on average at approximately 300 foot intervals throughout the site resulting in approximately 40 miles of berm construction. The total area disturbed would be at maximum about 1,200 acres. The Agency would initially construct about 400 acres of recharge basins with work expected to last about 4 weeks. After the initial construction is complete, the remainder of recharge basin construction will be continuous as recharge operations are cycled throughout the site. Construction operations for these basins would mainly consist of pushing dirt with a tractor or backhoe to create the low earthen berms along the existing contour lines and are typical to agricultural operations. Berms will not be large enough to drive on. To keep dust down, native plants will be allowed to propagate in and around the basins and berms. This vegetation will minimize dust potential. During recharge operations, the soil will be wet. During non recharge operations, the conditions are no different than they are now (fallowed undeveloped land).

Installation of the aboveground piping will consist of the delivery of pipe to the site with a truck and deposited along the sides of the recharge basins for hand installation. Installation of this piping will be continuous as recharge operations are cycled from one area of the site to another.

1.5.5 Groundwater Extraction Wells

The Agency proposes to construct an estimated18 extraction wells. These wells will be drilled approximately 500 feet deep with casing size yet to be determined. Construction operations include grading to level a 100 x 100 foot drilling pad area, well drilling and construction, well site fencing, overflow basins, well piping, well equipment installation including the pump, motors, and all associated electrical, mechanical, and instrumentation equipment. A typical 16-inch well may yield about 90 cubic yards of drilling spoil, which will be spread on site over an area of about 0.05 acres. Well facilities would be operated with electrical power and would not emit criteria pollutants.

Typical construction equipment will include;

- 1 drilling rig (500 HP, 24 hrs per day for 90 days).
- 1 hydraulic excavator (180 hp, 6 hours per day)
- 1 grader (174 hp, 6 hours per day)
- 1 off-highway truck (479 hp, 4 hours per day)
- 1 small roller compactor (114 hp, 1 hour per day)
- 1 skip loader (88 hp, 1 hour per day)
- 1 wheeled loader (313 hp; 1 hour per day)
- 1 water truck (200 hp, 1 hour per day)
- Test pump (200 hp, 60 hrs per well)

1.5.6 Booster Pump Station / Storage / Maintenance Facilities

The Agency proposes to construct a 150 CFS booster pump station and 250,000 gallon storage tank. The site will also house some maintenance facilities incorporated onto the pump station building. These facilities will be built on about a 2 acre site adjacent to the California Aqueduct with gravel parking pads. Construction work would consist of initial site grading and earthwork, piping installation, concrete foundation work, building construction including mechanical, electrical, plumbing, and instrumentation, and installation of the storage tank. Booster pump facilities would be operated with electrical power and would not emit criteria pollutants. The storage tank is proposed to be between 24 and 32 feet high. Construction operations are anticipated to take about 12 months.

Typical construction equipment will vary by construction phase but on average will include;

- 1 crane (190 hp, 6 hours per day)
- 1 hydraulic excavator (180 hp, 6 hours per day)
- 1 grader (174 hp, 6 hours per day)
- 1 off-highway truck (479 hp, 4 hours per day)
- 1 water truck (200 hp, 4 hours per day)
- 1 belly scraper (313 hp, 4 hours per day)
- 1 wheeled loader (165 hp, 8 hours per day)
- 1 roller (114 hp, 3 hours per day)
- 2 backhoes (108 hp, 5 hours per day)
- 1 skip loader (88 hp, 1 hour per day)
- Welder (25 hp, 8 hours per day)
- Air compressor for sandblasting and coating (25 hp, 8 hours per day)

1.5.7 Construction Best Management Practices

During construction, the Agency will be implementing Best Management Practices to minimize impacts, including;

- Allow native plants to restore after construction of recharge berms,

- Dust control of access roads and disturbed areas via watering and equipment travel speed limits,
- Use of construction and material hauling equipment that is compliant with local and state air quality standards,
- Use of noise reduction measures, and
- Cover long term (1 week or more) stockpiles with tarps.

1.5.8 Demolition

There is an existing residential house within the limits of the proposed recharge operations that may be designated for demolition. Construction operations related to the demolition of this structure have been considered as negligible when compared to the other construction work.

1.6 Purpose and Need

The Agency is a State Water Contractor supplying SWP water to portions of northern Los Angeles and southeastern Kern counties. The Agency's function is to supplement the local groundwater and surface water supplies with supplies from the SWP, which are delivered under the Agency's contract with the California Department of Water Resources (DWR), via the California Aqueduct.

The Agency has determined that the region does not have substantial water storage facilities south of the Tehachapi Mountains. The Agency understands that Water storage is a standard feature of water supply operations. This water supply resource is implemented throughout the world and is of particular concern in California, where the climate tends to fluctuate between wet and dry years resulting in major fluctuations of the water supplies. California relies on an extensive system of dams to store water in above normal to wet weather years for use in below normal to dry weather years. The function of storage is to stabilize water supply so that during drought and emergency conditions, rationing is maintained at levels which do not cause substantial economic and social hardship. In recent years, new storage has been focused on groundwater storage, in part because of the difficulty in siting and permitting above ground storage reservoirs and due to the lower costs and less potential for evaporation associated with groundwater storage.

Over the years, the fluctuations in the reliability of water supply have increased tremendously in California. These fluctuations are a result of hydrologic conditions and environmental regulations. DWR provides possible operational guidance to State Water Contractors that support the lack of stability of the water supply in the State. Factors associated with these fluctuations include:

- Significant water supply fluctuations during critical drought year conditions,
- Potential for supply interruptions associated with failure of levees in the Sacramento San Joaquin Bay Delta. Levee failure from flooding and earthquake could result in long terms periods when water quality would be unsuitable for delivery.
- Recent seismic studies by the United States Geologic Survey suggest that there is an increasing potential for earthquakes along major faults in California. The California Aqueduct crosses these faults many times and earthquakes along the alignment of the California Aqueduct may damage the aqueduct severely, resulting in suspension of supply deliveries; and
- Recent regulatory actions related to operations of DWR's South Delta facilities have resulted in the reduced ability to export water to protect the Delta's eco system. This has resulted in a reduced water supply reliability in all years (wet and dry).

Based on these and other considerations, the Agency has concluded that there is a critical and immediate need for groundwater storage in the Region. Failure to provide needed storage in a timely manner could result in substantial rationing during a critical drought or during either emergency or regulatory reductions in DWR's ability to deliver supplies. Earthquakes, floods, and outages may result in the inability to import supplies, even if they are available, and thus out of basin (north of the Tehachapi Mountains) storage is

not a viable option for ensuring reliable water supplies in the Southern California area during periods of drought related or regulatory supply interruptions.

The Agency has evaluated the need for storage of groundwater in several recent documents, including the 2015 Urban Water Management Plan[4] and West Water Research LLC Financial Feasibility Assessment of Developing Enterprise Water Bank Capacity at the Far West Site dated March 2017[24]. Based on these assessments, the Agency has taken note of the potential needs for storage of water and is proposing to expand its function to provide groundwater storage to not only benefit customers within the region but other potential groundwater banking partners throughout the State.

1.7 Impact Avoidance and Minimization Measures

The Agency has incorporated a number of impact avoidance and minimization measures into the proposed project. They include mitigation measures addressing the following categories of impact

- Agricultural,
- Air Quality,
- Biological,
- Cultural,
- Geology and Soils,
- Hazards and Hazardous Materials,
- Hydrology & Water Quality,
- Noise,
- Utilities and Service Systems, and
- Tribal Cultural Resources.

The Agency does not anticipate any significant impacts associated with the project on the following environmental resources:

- Aesthetics,
- Greenhouse Gas Emissions,
- Land Use and Planning,
- Mineral Resources,
- Population and Housing,
- Public Services,
- Recreation, and
- Transportation and Traffic.

1.8 Permits Required

The Agency would require the following permits for the implementation of the Project:

- Encroachment Permits for any work within Public Right of Way.
- National Pollutant Discharge Elimination System Construction Activities General Permit.
- Department of Water Resources Turnout Construction and Operations Permit.
- Department of Water Resources Encroachment Permit (if needed)
- Caltrans heavy or oversized equipment Transportation Permit (if needed).

SECTION 2
EVALUATION OF POTENTIAL ENVIRONMENTAL IMPACTS

2.1 General Environmental Setting

The Proposed Project is located in the Antelope Valley region in northern Los Angeles County. The Antelope Valley region is described as high desert, with elevations on the valley floor ranging from about 3,500 feet along the mountains to the south, west, and north to about 2,200 feet at the Edwards Air Force Base west boundary. The surrounding mountains range from 6,000 to 9,000 feet in elevation and function to reduce coastal influences on the desert region. In mid-summer, daily high temperatures exceed 100° Fahrenheit (F), mean temperatures range between 60 and 90°F. Winter temperatures from December through mid-March average between 30 and 65°F. Rainfall in the Valley averages about 5 to 10 inches per year, with average monthly rainfall from 1 to 2 inches from December through March and below 1 inch for the remainder of the year. There is seldom snowfall on the valley floor, although the mountains may receive significant snow at higher elevations. Average monthly winds are moderate, but there can be periods of steady west to east winds exceeding 20 miles per hour across the valley floor. Dust storms are common in the area. Winds are highest in the spring and summer, but daily wind speeds of more than 5 miles per hour occur on an almost constant basis. Soils in the area consist of fine sands and sandy loams, which are subject to dispersal by winds.

The valley floor and its wildlife habitat are dominated by desert adapted plants and species. The valley floor is dominated by rabbitbrush scrub and creosote bush scrub, generally highly disturbed by historic and ongoing disturbance. The valley is a "V-shaped" valley surrounded by the Tehachapi Mountains on the northwest and the San Gabriel Mountains on the southwest. The valley does not drain to the sea, and runoff from the mountains flows down a number of ephemeral washes and then spreads out across the valley floor. The valley floor is relatively flat, with north south land slope of approximately 3 to 6 feet per mile. During flood conditions, runoff across the valley floor is characterized by shallow sheet flow. Flood flows end up in the large dry lake beds of Edwards Air Force Base. The proposed Project is located just east of the Tehachapi and San Gabriel Mountain ranges in Flood Zone A (FEMA Flood Designation for the 100 Yr Flood with no Flood Elevation Determined)[14].

The proposed Project is located on alluvial soils. Soils in the alluvial plain are characterized by mixed sands, silts, and clays, deposited in patches as a result of the meandering channels that drain the surrounding mountains. The patchy distribution of such soils occurs below ground, and thus the upper groundwater basin has intermittent lenses of clay and silt known as aquitards because they block the flow of groundwater. When water percolating into the ground encounters these intermittent aquitards, it flows horizontally until reaching the edge of the aquitard, where it resumes percolation into the groundwater. Layers of clay become thicker and more extensive towards the east end of the basin, in the area that was once Lake Thompson. Natural groundwater recharge occurs at the base of the mountains and groundwater then tends to flow north and east to the valley low point at Edwards Air Force Base. Existing groundwater levels in the Antelope Valley vary. Groundwater levels in the vicinity of the proposed Project range between 280 to 300 feet below ground surface. Groundwater extraction has lowered groundwater levels across a wide portion of the Antelope Valley. The basin has now been adjudicated to prevent further over drafting of the basin.

The Antelope Valley is in a highly active geologic area, with the San Andreas Fault zone running along the base of the San Gabriel Mountains, and the Garlock fault zone running along the base of the Tehachapi Mountains.

The proposed Project area is located west of the cities of Palmdale and Lancaster on the western reaches of the flat alluvial plain of the Antelope Valley. There are several state desert wildlife preserves,

including the California Poppy Preserve (about 15 miles west of Lancaster) and the Arthur B. Ripley Desert Woodland State Park (about 7 miles west of the Poppy Reserve).

The proposed Project area is located in land designated as OS-C (Open Space Conservation) and RL-10 (Rural Land 1 dwelling unit per 10 gross acres). Current land use is almost exclusively agricultural fallowed land and some isolated residential homes. Refer to Figure 1B in Appendix A for an aerial view of the land within and nearby the Project site. With the exception of 1 house within the Project area, there is no other development close by. The nearest residential communities are located ½ miles south and 2 miles east of the Project area.

2.2 Aesthetics

2.2.1 Introduction

The desert portion of the Antelope Valley offers diverse geological and physiographic features surrounded by the San Gabriel Mountains to the south, the Liebre and Sierra Pelona Mountains to the southwest, the Tehachapi Mountains to the northwest, and desert valley/mountain terrain in San Bernardino County to the east. Because of the unique geologic characteristics and varying climate within the Antelope Valley, a diversity of animal and plant habitats extend throughout this area. The geologic and biological diversity of the Antelope Valley sets the tone for scenic resources within the region. Many scenic resources within the Antelope Valley have been preserved as open space, including the Los Padres and Angeles National Forests; several state parks, wildlife sanctuaries, regional parks, and other local park lands; and lakes, reservoirs, and other water features. Scenic vistas are provided within these resources, and encompass views of an area that are visually or aesthetically pleasing.

The Project site is comprised of undeveloped and fallowed agricultural land that primarily contains creosote bush scrub. The Project site is relatively flat with a slope from west to east of less than 0.5%. Based on the described topographic and vegetation characteristics, nearby views of the site are not considered scenic. Project facilities will be designed to utilize unobtrusive materials (e.g., paint colors), where possible.

Project specific, above ground facilities such as the aqueduct turnout metering building, aboveground turnouts and piping, pump station, and storage tank would have the potential to affect aesthetics. The recharge areas and buried pipelines will not alter the views of the site when compared to existing ongoing agricultural and groundwater recharge operations nearby. Additionally, the site is located in a remote area of the Antelope Valley floor that is not readily visible from major paved roads and highways.

2.2.2 Potential Impacts

Construction of the aqueduct turnout metering building, pump station, and storage tank will be located adjacent to the California Aqueduct. These facilities will vary in height from about 15 feet for the buildings to about 32 ft for the storage tank. These facilities will be constructed of materials and colors that match the current surroundings. The visual impact associated with these permanent facilities will be less than significant as they will blend in with the views of the land as part of the California Aqueduct facilities system which occur throughout the aqueduct reach in this region including the Oso Pumping Station. Additionally, existing Southern California Edison power lines may also need to be re wired to provide power to the site, and local lines may need to be extended to provide power to well pumps. These changes would not alter the visual character of the area, as above ground power lines are a feature of the landscape.

The aboveground turnouts are anticipated to rise about 6 feet above the ground and are also anticipated to result in a less than significant impact to the visual character of the existing site. This is as a result of the small quantity and footprint of these turnouts over the vast open space area within and surrounding the Project. Views of the temporary recharge pipelines are likely to be obscured by the native grasses

grown as part of the recharge operations and thus having a less than significant impact to the visual character of the land. Temporary construction related effects on views could occur with regard to staging areas and construction; however, these will not result in significant impacts due to their short term, temporary nature.

2.2.3 Mitigation

No mitigation will be needed as the impacts to aesthetics associated with the Project are deemed to be less than significant.

2.2.4 CEQA Significance

The proposed Project facilities would not be inconsistent with existing groundwater recharge operations north of the proposed Project site.

Based on the analysis of the potential effects of the proposed Project, the Initial Study concludes that the impacts to aesthetics will be less than significant and that:

a. No features of the Project would have a substantial adverse effect on a scenic vista.

Temporary berms will not be higher than about 36 inches. Above ground facilities will not be inconsistent with facilities existing in the area.

b. No features of the Project would substantially damage scenic resources.

No damage to trees, rock outcroppings, and historic buildings will occur. The site is not near a state scenic highway.

c. No features of the Project would substantially degrade the existing visual character or quality of the site and its surroundings.

Proposed project facilities are not inconsistent with current ongoing operations of land nearby.

d. No features of the Project would create a new source of substantial light or glare that would adversely affect day or nighttime views of the area.

Proposed project buildings will not need substantial lighting at night:

2.3 Agriculture and Forest Resources

2.3.1 Introduction

The proposed Project is located in the Antelope Valley, a semiarid region averaging less than 10 inches of precipitation per year, but which has been extensively used for irrigated agriculture. Agriculture in the Antelope Valley consists of a variety of field, vine, and row crops, including wheat, carrots, and onions. A portion of the Project site is currently in agricultural use and/or fallowed. The agricultural area on the northwest corner of the property consisting of what appears to be peach trees has not been maintained and the trees appear to be dormant or dead. No land has been subdivided for dense urban development. The Project is not located within any designated forest lands. Approximately 100 acres within the Project area are designated as “Prime Farmland”, 120 acres is designated “Other,” and the remaining is designated “Grazing” by the Farmland Mapping and Monitoring Program (Los Angeles County 2014)[7]. The project does not contain any farmland designated to be within a Williamson Act Contract. Refer to Figures 4 and 5 in Appendix A.

2.3.2 Potential Impacts

There are no potential impacts to forest resources as the Project site is not located within any designated forest lands. The Project site currently holds about 100 acres of prime farmland. 60 acres located on the northwest corner of the Project site are currently what appear to be dormant or dead peach trees. The remaining 40 acres located on the southwest quarter of Section 1 and northwest quarter of Section 12 are currently fallowed. Refer to Figures 1B and 4 in Appendix A. Recharge operations have the potential to impact farming operations of the designated Prime Farmland areas. Specifically, the 60 acres of prime farmland at the northwest corner of the property. Given the proposed recharge capacity, the Agency does not need the entire Project site for recharge operations and thus is able to avoid changing the use of semi active farmed Prime Farmland to recharge basin uses. The Prime Farmland area that is currently fallowed will remain fallowed and used by the Agency for recharge operations.

One effect of the Agency's ownership of the subject lands will also be to minimize the potential for future conversion of these lands to nonagricultural or open space purposes. This would be a benefit, not an adverse impact to the area and would be consistent with the policies for preservation of agriculture and open space in Antelope Valley.

2.3.3 Mitigation

To avoid the potential for disturbance of semi active Prime Farmland, the Agency proposed the following mitigation measure:

AG-1: Prime Farmland Avoidance – The Agency will not perform recharge operations on the 60 acres of semi active farmed Prime Farmland on the northwest corner of the property.

2.3.4 CEQA Significance

Based on the analysis of the potential effects of the proposed Project, the Initial Study concludes that with Mitigation Measures the impact to agriculture and forest resources will be less than significant and that the Project:

a. Would not 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.

Semi actively farmed Prime Farmland will remain. Fallowed Prime Farmland will remain fallowed with the option to use for recharge operations.

b. Would not conflict with existing zoning for agricultural use and or conflict with an existing Williamson Act Contract.

The Project will not involve any land use zoning or designation changes and there is no Williamson Act farmland within the Project site.

c. Would not conflict with existing zoning for, or cause rezoning of, forest land (as defined in California 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)).

There are no forest or timber lands within or near the Project site.

d. Would not result in the loss of forest land or conversion of forest land to non-forest use?

There are no forest or timber lands within or near the Project site.

e. Would not 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?

There will be no conversion of agricultural land to other uses. There are no forest or timber lands within or near the Project site.

2.4 Air Quality

2.4.1 Introduction

The project is located within the Mojave Desert Air Basin (MDAB) under the jurisdiction of the Antelope Valley Air Quality Management District (AVAQMD). The AVAQMD lies within the northern, desert portion of Los Angeles County. The AVAQMD boundaries start on the south just outside of Acton, north to the Kern/Los Angeles County line, east to the San Bernardino/Los Angeles County line, and west to the Quail Lake area. The AVAQMD is responsible for implementing and enforcing state and federal air quality regulations. Six air pollutants have been identified by the United States Environmental Protection Agency (EPA) and the California Air Resources Board (ARB) as being of concern both on a nationwide and statewide level: ozone; carbon monoxide (CO), nitrogen dioxide (NO2), sulfur dioxide (SO2); and particulate matter (PM) which is subdivided into two classes based on particle size: PM equal to or less than 10 micrometers in diameter (PM10) and PM equal to or less than 2.5 micrometers in diameter (PM2.5). These air pollutants are commonly referred to as “criteria air pollutants” because air quality standards are regulated using human health and environmentally based criteria. In accordance with Federal Clean Air Act (CAA) and California Clean Air Act requirements, the EPA developed numerical concentration based standards, or National Ambient Air Quality Standards (NAAQS), while the ARB developed the California Ambient Air Quality Standards (CAAQS).

Both EPA and ARB use ambient air quality monitoring data to designate areas according to their attainment status for criteria air pollutants. EPA has designated the MDAB as nonattainment for ozone; while ARB has designated the MDAB as extreme nonattainment for ozone and nonattainment for PM10. It should be noted that ozone is not directly emitted; instead, it is formed via a photochemical reaction which occurs when its precursors, volatile organic compounds (VOCs) and oxides of nitrogen (NOX) (which includes NO2), react in the presence of sunlight. Therefore, emissions thresholds and estimates evaluate these in place of ozone.

2.4.2 Potential Impacts

There are potential impacts to air quality as a result of the project during construction and operations. The following sections analyze each of the potential impacts to air quality:

2.4.2.1 Conflict with or Obstruct Implementation of the Applicable Air Quality Plan

Air quality plans describe the air pollution control strategies to be implemented by a city, county, or regional air district. The primary purpose of an air quality plan is to bring an area that does not attain the NAAQS and the CAAQS into compliance with those standards pursuant to the CAA and California Clean Air Act. As stated in section 2.4.1 above, the MDAB is currently designated as nonattainment for ozone and PM_{10}. The AVAQMD is responsible for preparing air quality attainment plans to be transmitted to the ARB and EPA for incorporation into the State Implementation Plan (SIP). The most recent applicable air quality plan developed by the AVAQMD is the Federal 8-Hour Ozone Attainment Plan adopted in 2008.

Air quality attainment plans in AVAQMD include the latest planning assumptions regarding population, vehicle activity, and industrial activity as well as strategies such as the adoption of rules and regulation; enhancement of CEQA participation; adoption of local air quality plans; and stationary, mobile, and indirect source control measures. According to the AVAQMD CEQA and Federal Conformity Guidelines, a project's consistency with the applicable air quality plan is based on consistency with the existing land use plan or consistency with dwelling unit density and vehicle activity levels (AVAQMD 2016)[5].

The project is consistent with the existing land use and would not involve land use zoning or designation changes. As such, the project would not conflict with or obstruct the implementation of the applicable air quality plan. Therefore, this impact would be less than significant.

2.4.2.2 Violate any Air Quality Standard or Contribute Substantially to an Existing or Projected Air Quality Violation

In order to best evaluate this topic, emissions associated with both construction and operations were evaluated.

Construction Related Emissions

Construction emissions are short term or temporary but have the potential to result in a significant impact on air quality. Construction activities for the project would generate temporary emissions of volatile organic compounds (VOC) and NO_X, CO, PM_{10}, and $PM_{2.5}$. VOC, NO_X, and CO emissions are associated primarily with mobile equipment exhaust, including off road construction equipment and on road motor vehicles. Fugitive particulate matter dust emissions are associated primarily with site preparation and travel on unpaved roads and vary as a function of parameters such as soil silt content, soil moisture, wind speed, acreage of disturbance area, and miles traveled by construction vehicles. Emissions would vary from day to day, depending on the level of activity, the specific type of construction activity occurring, and, for fugitive dust, prevailing weather conditions.

Total construction emissions for the project were estimated using emission factors from the California Air Resources Board (ARB) OFFROAD and EMFAC 2014 inventory models (ARB 2013). Construction emissions from the operation of diesel fueled off road equipment were estimated by multiplying daily usage (i.e., hours per day) and total days of construction by OFFROAD equipment specific factors. Emissions from on road motor vehicles were estimated using vehicle trips, vehicle miles traveled, and EMFAC 2014 mobile source emission factors. The emission factors represent the fleet wide average emission factors within the AVAQMD region. Fugitive dust emissions were estimated using the EPA's Compilation of Air Pollutant Factors (AP-42) and are based on vehicle miles traveled, material loading, excavation, and stockpiling.

To provide guidance for project analysis under CEQA, the AVAQMD has established recommended annual and daily thresholds of significance for criteria pollutant emissions as shown in Tables 2.4-1 and 2.4-2, respectively[5]. A project with emission rates below these thresholds is considered to have a less than significant effect on regional and local air quality throughout the AVAQMD.

Construction of the project is expected to last approximately 24 months. The construction emissions analysis relied on a project specific construction schedule and inventory of construction equipment estimates. The estimated construction workforce is a maximum of thirty workers per day. Project construction was conservatively analyzed using multiple overlapping activity scenarios to obtain the worst case daily emissions. The construction schedule presented in Section 1.5 shows the six construction activities due to take place as part of the proposed project; the activities were numbered 1 through 6 (Monitoring Well installation, through Pump Station and Storage construction, respectively) and the respective emissions summed for periods of overlap.

Construction would involve demolition of several structures, including one small residence; the amount of demolition was deemed negligible due to the overall project size. The remainder of the project consists

primarily of drilling, earthmoving, and small construction projects (e.g. turnout installation [to withdraw water from the California Aqueduct], underground pipeline placement; pump metering/booster station and storage tank construction). Fugitive dust generation was estimated for drilling and grading, spreading and stockpiling of spoils, and above ground pipeline installation. Paved and unpaved road dust would occur from worker vehicle trips and haul truck trips on highways, local roads, and access roads. Particulate emissions associated with vehicle travel over unpaved roads were conservatively estimated assuming a one way distance of 3 miles per trip, the anticipated maximum distance traveled over unpaved roads for both worker and delivery vehicles. The project would implement applicable AVAQMD rules and regulations such as: Rule 1140 (Abrasive Blasting), Rule 1113 (Architectural Coatings), Rule 1110.2 (Emissions from Stationary, Non-road & Portable Internal Combustion Engines), as well as appropriate dust-abatement measures to comply with regulations Rule 401 (Visible Emissions), Rule 403 (Fugitive Dust), and Rule 404 (Particulate Matter Concentration).

As shown in Table 2.4-1, the annual construction emissions associated with the Project are below the AVAQMD annual thresholds.

Table 2.4-1 Unmitigated Project Annual Construction Emissions

Construction Year	VOC	NO_X	CO	PM_{10}	$PM_{2.5}$
ONE (tons)	0.87	10.27	7.28	5.00	1.25
TWO (tons)	**1.08**	**12.41**	**8.83**	**5.24**	**1.36**
MAXIMUM Annual Construction Emissions (tons)	1.08	12.41	8.83	5.24	1.36
AVAQMD Significance Threshold (tons)	25	25	100	15	12
Exceeds AVAQMD thresholds?	No	No	No	No	No

Source: Estimated by AECOM in 2017. Additional modeling assumptions and individual phase details provided in Appendix C.

Table 2.4-2 presents daily emissions associated with the worst case overlapping construction activity scenario. Additional modeling assumptions and details are provided in the project specific Air Quality Analysis Technical Report in Appendix C.

Table 2.4-2 Unmitigated Project Daily Construction Emissions

Construction Phase	VOC (lbs/day)[1]	NO_X (lbs/day)	CO (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
Activity 1: Monitoring Wells (Installation)	2.77	32.14	25.46	2.15	1.57
Activity 2: Aqueduct Turnout, Construction	2.27	27.59	19.71	18.11	4.64
Activity 3: Underground Pipelines, Trenching	4.32	45.00	34.31	11.86	4.64
Activity 4: Recharge Basin, Grading, and Above-ground Pipeline, Installation	0.80	5.53	11.98	3.18	1.88
Activity 5: Extraction Wells, Installation	5.95	71.16	40.80	40.25	7.34
Activity 6: Booster Pump Station, Construction, and Water Storage, Construction	29.19	48.42	32.44	23.01	5.79
Maximum Daily Construction Emissions: Subtotal of Activities 3,5,6 (overlap Year Two, months 1-5) (lbs/day)	39.45	164.57	107.55	75.13	17.77
AVAQMD Significance Threshold (lbs/day)	137	137	548	82	65
Exceeds AVAQMD thresholds?	No	YES	No	No	No

[1] lbs/day = pounds per day
Source: Estimated by AECOM in 2017. Additional modeling assumptions and individual phase details provided in Appendix C.

As shown in Table 2.4-2, construction related daily NO_X emissions would exceed the thresholds of significance. Therefore, construction emissions could potentially violate an ambient air quality standard or contribute substantially to an existing violation. Incorporation of Mitigation Measure AQ-1 (See Section 2.4.3) would be required to reduce criteria pollutant emissions.

Implementation of Mitigation Measure AQ-1 would ensure construction activities associated with the construction of the project would minimize criteria pollutant emissions. Mitigation Measure AQ-1 requires engines in diesel fueled construction equipment above 50 horsepower to meet Tier 4 emission standards. Emission standards for diesel off road equipment are based on the engine model year. Implementation of these standards, referred to as Tier 1 emission standards, became effective in 1996. The more stringent Tier 2 and Tier 3 emission standards became effective between 2001 and 2008, with the effective date dependent on engine horsepower. Tier 4 interim standard became effective between 2008 and 2012, and Tier 4 final standards became effective in 2014 and 2015.

The OFFROAD model used in the analysis contains ranges of tier engines and uses average fleet data to develop emission factors for a given calendar year. Based on the improvements in emissions standards required by CARB, the analysis assumes that using off road construction equipment with Tier 4 interim engines would result in an additional reductions in criteria pollutant emissions from the average fleet data emissions. Table 2.4-3 shows the mitigated daily emissions for construction activities.

Table 2.4-3 Mitigated Project Daily Construction Emissions

Construction Phase	VOC (lbs/day)[1]	NO_X (lbs/day)	CO (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
Activity 1: Monitoring Wells (Installation)	1.89	24.82	46.70	1.47	0.95
Activity 2: Aqueduct Turnout, Construction	1.11	18.12	22.33	17.36	3.94
Activity 3: Underground Pipelines, Trenching	1.36	**21.76**	39.21	10.05	2.98
Activity 4: Recharge Basin, Grading, and Above-ground Pipeline, Installation	0.61	4.43	12.02	3.01	1.73
Activity 5: Extraction Wells, Installation	2.79	**45.12**	77.05	38.47	5.67
Activity 6: Booster Pump Station, Construction, and Water Storage, Construction	26.84	**30.21**	37.33	21.57	4.46
Maximum Daily Construction Emissions: Subtotal of Activities 3,5,6 (overlap 2019, months 1-5) (lbs/day)	30.99	**97.09**	153.59	70.08	13.11
AVAQMD Significance Threshold (lbs/day)	137	137	548	82	65
Exceeds AVAQMD thresholds?	No	No	No	No	No

[1] lbs/day = pounds per day
Source: Estimated by AECOM in 2017. Additional modeling assumptions and individual phase details provided in Appendix C.

Operations Related Emissions

After construction, operations related activities would be limited to one full time worker performing berm maintenance to offset the effects of erosion, and to continuously add new earthen berms and recharge basins over the remaining areas of the project site. Two additional employees would be responsible for performing above ground pipe relocations for approximately five days every four months. As shown in respective Tables 2.4-4 and 2.4-5, the estimated annual and daily criteria pollutant emissions from operations would not exceed AVAQMD thresholds of significance.

Table 2.4-4 Project Annual Operational Emissions

Operational Emission Source	VOC (tons)	NO_X (tons)	CO (tons)	PM_{10} (tons)	$PM_{2.5}$ (tons)
Total Operational Emissions (tons)	0.10	0.72	1.56	1.79	0.58
AVAQMD Significance Threshold (tons)	25	25	100	15	12
Exceeds AVAQMD thresholds?	No	No	No	No	No

Source: Estimated by AECOM in 2017. Additional modeling assumptions and individual phase details provided in Appendix C.

Table 2.4-5 Project Daily Operational Emissions

Operational Emission Source	VOC (tons)	NO_X (tons)	CO (tons)	PM_{10} (tons)	$PM_{2.5}$ (tons)
Total Construction Emissions (lbs/day)	0.80	5.53	11.98	7.01	3.95
AVAQMD Significance Threshold (lbs/day)	137	137	548	82	65
Exceeds AVAQMD thresholds?	No	No	No	No	No

Source: Estimated by AECOM in 2017. Additional modeling assumptions and individual phase details provided in Appendix C.

As shown in Table 2.4-3, incorporation of Mitigation Measure AQ-1 would reduce daily construction-related criteria pollutant emissions to a less than significant level. Tables 2.4-4 and 2.4-5 show that criteria pollutant emissions during operational activities would not exceed the significance thresholds. Therefore, construction related emissions could potentially violate an ambient air quality standard or contribute substantially to an existing violation. This impact would be less than significant with mitigation.

In addition, Since the project must comply with AVAQMD Rule 403 and will result in a Disturbed Surface Area greater than 5 acres and/or in the moving, depositing or relocating more than 2,500 cubic yards of Bulk Materials on at least three days (as detailed in Section [D][1] of the rule), the project will need to assemble and submit a Dust Control Plan (DCP) to the AVAQMD. The DCP must be reviewed and conditionally approved by the Air Pollution Control Officer (APCO). In addition, the project owner must provide written notice to the APCO at least 10 days prior to commencement of earth-moving activities

2.4.2.3 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

The cumulative analysis of construction and operational emissions focuses on whether a specific project would result in a cumulatively considerable increase in emissions. By its very nature, air pollution is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development, and this regional impact is cumulative rather than attributable to any one source. As stated in the AVAQMD CEQA and Federal Conformity Guidelines, cumulative impacts are similar to direct and indirect impacts of the project. For projects to be determined to not have a significant cumulative air quality impact, consistency with the applicable air quality plans and mitigation requirements must be shown.

Construction of the project would generate criteria air pollutant emissions through the use of off-road equipment, worker commutes, and delivery truck trips. As shown in Table 2.4-2, the project would exceed the thresholds of significance for NO_x emissions. These thresholds are designed to identify those projects that would result in significant levels of air pollution and to assist the region in attaining the applicable state and federal ambient air quality standards. Projects that would not exceed the thresholds of significance would not contribute a considerable amount of criteria air pollutant emissions to the region's emissions profile, and would not impede attainment and maintenance of ambient air quality standards. As discussed above, Mitigation Measure AQ-1 would be required. As shown in Tables 2.4-3, incorporation of Mitigation Measure AQ-1 would reduce criteria pollutant emissions to a less than significant level. This impact would be less than significant with mitigation. In addition, the project would be consistent with the existing land use plan and operational emissions would not exceed the thresholds of significance.

Because the project would not exceed any project level air quality significance thresholds, the project's construction and operational emissions would not be cumulatively considerable. Therefore, impacts related to a cumulatively considerable net increase of criteria pollutants would be less than significant with mitigation.

2.4.2.4 Expose Sensitive Receptors to Substantial Pollutant Concentrations

Some members of the population are especially sensitive to air pollutant emissions and should be given special consideration when projects' air quality impacts are evaluated. The groups include children, older adults, persons with preexisting respiratory or cardiovascular illnesses, rehabilitation centers, convalescent centers, and retirement homes. According to the AVAQMD CEQA and Federal Conformity Guidelines, sensitive receptors include: residences, schools, daycare centers, playgrounds and medical facilities.

The project site is located in a primarily agricultural fallowed undeveloped area, and not in the immediate vicinity of sensitive receptors. The nearest semi concentrated sensitive receptors to the project site are dwelling units located over 0.5 mile south and 2 miles east of the project area. The greatest potential for toxic air contaminant (TAC) emissions would be related to diesel PM emissions associated with heavy-duty construction equipment activity.

The Office of Environmental Health Hazard Assessment (OEHHA) developed a Guidance Manual for the Preparation of Health Risk Assessments (OEHHA 2015). According to OEHHA methodology, health effects from carcinogenic TACs are usually described in terms of individual cancer risk, which is based on a 30-year lifetime exposure to TACs. Construction activities, such as demolition, grading, and pipeline installation, would most likely occur over smaller footprints spread across the proposed project site. Given the large project area and variety of construction activities, construction emissions would occur intermittently throughout the day and would not occur as a constant plume of emissions from the project site. In addition to the considerable buffer distance to the nearest sensitive receptors and the highly dispersive nature of diesel PM emissions, construction and operation of the project would not exceed the AVAQMD mass emissions significance thresholds. Therefore, the project would not expose sensitive receptors to substantial construction or operational TAC concentrations. Accordingly, air quality impacts on sensitive receptors would be less than significant.

2.4.2.5 Create Objectionable Odors Affecting a Substantial Number of People

The occurrence and severity of odor impacts depend on numerous factors, including the nature, frequency, and intensity of the source; wind speed and direction; and the presence of sensitive receptors. While offensive odors rarely cause any physical harm, they still can be very unpleasant, leading to considerable distress and often generating citizen complaints to local governments and regulatory agencies.

Potential sources that may emit odors during construction activities include exhaust from diesel construction equipment. However, due to the substantial distance to the nearest semi concentrated sensitive receptors and the highly diffusive properties of diesel exhaust, nearby receptors would not be affected by diesel exhaust odors associated with project construction. The project would utilize typical construction techniques, and the odors would be typical of most construction sites and temporary in nature. Operation of the project would not add any new odor sources beyond existing conditions. The proposed project must also comply with AVAQMD's Rule 402—Nuisance. As a result, the project would not create objectionable odors affecting a substantial number of people. Accordingly, odor impacts would be less than significant.

2.4.3 Mitigation

The following mitigation measure is proposed to minimize the impacts associated with construction related emissions of NOx which are anticipated to exceed the level of significance as designated by the AVAQMD.

AQ-1: Minimization Measure for NOx Related Emissions - Construction contractor shall use off road construction diesel engines that meet, at a minimum, the Tier 4 interim California Emissions Standards, unless such an engine is not available for a particular item of equipment. Tier 3 engines will be allowed on

a case by case basis when the contractor has documented that no Tier 4 interim equipment, or emissions equivalent retrofit equipment is available for a particular equipment type that must be used to complete construction. Documentation shall consist of signed written statements from at least two construction equipment rental firms.

2.4.4 CEQA Significance

Based on the analysis of the potential effects of the proposed project, the Initial Study concludes that with Mitigation Measures in place, the impact to air quality will be less than significant and that the project:

- ***a.*** *Would not conflict with or obstruct implementation of the applicable air quality plan.*
- ***b.*** *Would not violate any air quality standard or contribute substantially to an existing or projected air quality violation.*
- ***c.*** *Would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard.*
- ***d.*** *Would not expose sensitive receptors to substantial pollutant concentrations.*
- ***e.*** *Would not create objectionable odors affecting a substantial number of people.*

Refer to Section 2.4.2 for explanations which were used to make the above noted conclusions.

2.5 Biological Resources

The following discussion is from the Project's April 2017, Biological Technical Report[2]. Refer to Appendix D.

2.5.1 Introduction

The Project is located in northern Los Angeles County, California, in the western Antelope Valley, a semi-arid region with gently sloping topography. Much of the region is used to support both irrigated and dry farming agriculture, livestock grazing, and various energy projects. Undisturbed native habitats are limited in the region, although many previously disturbed areas have been recolonized by native and naturalized plant species and provide habitat for native wildlife.

The Project site encompasses a largely undeveloped area that was previously used to support agricultural activities and grazing; remnants of these activities are observable in the field and on aerial photography. The site occurs immediately north of the California Aqueduct, which supports dense brush and trees on the south side and provides a reliable, year-round source of water for the region. Adjacent properties support similar habitats to those within the Project site, including native herbaceous and scrub habitats and non-native, naturalized grasslands. Areas immediately south of the aqueduct consist of irrigated agricultural fields with limited development.

The majority of the site is dominated by common herbaceous and scrub species, with limited areas of fallowed orchards and isolated development including pipeline infrastructure and residences. Three native or naturalized vegetation communities, including fiddleneck (*Amsinckia* sp.) fields, rubber rabbitbrush (*Ericameria nauseosa*), and non-native annual grasslands, and two anthropogenic land cover types, including fallow agriculture and development, were identified within the site. Wildlife observations were generally of common species typically associated with scrub and grassland habitats and common throughout the region, including western side-blotched lizard (*Uta stansburiana elegans*), western meadowlark (*Sturnella neglecta*), western kingbird (*Tyrannus verticalis*), common raven (*Corvus corax*), California quail (*Callipepla californica*), white-crowned sparrow (*Zonotrichia leucophrys*), and desert cottontail (*Sylvilagus audubonii*). Burrowing mammals including panamint kangaroo rats (*Dipodomys*

panamintinus) and California ground squirrels (*Otospermophilus beecheyii*) and their sign were common throughout the site. Raptors species including northern harrier (*Circus cyaneus*), red-tailed hawk (*Buteo jamaicensis*), and Cooper's hawk (*Accipiter cooperii*) also were observed; although nesting habitat for tree-nesting species is limited within the Project site, these raptors and others in the region may use the grasslands and scrub habitats as foraging and nesting habitat.

Rubber rabbitbrush scrub, fiddleneck fields, and annual grassland habitats form a mosaic throughout the Study Area, and support a diverse population of native and non-native forbs and grasses. Fiddleneck fields and annual grasslands in the Study Area exhibit similar species composition, with native fiddlenecks including common fiddleneck (*Amsinckia intermedia*) and devil's lettuce (*Amsinckia tessellata*) or non-native grasses including ripgut brome (*Bromus diandrus*), cheatgrass (*Bromus tectorum*), and foxtail barley (*Hordeum murinum*) dominant. Other common species include Great Valley phacelia (*Phacelia ciliata*), California goldfields (*Lasthenia californica*), cryptanthas (*Cryptantha* spp.), filarees (*Erodium* sp.), and red brome (*Bromus madritensis*). The majority of these species tend to colonize disturbed areas quickly and are indicators of previous disturbance.

Rubber rabbitbrush scrub is dominated by rubber rabbitbrush and is common both on the Project site and on adjacent properties. The understory tends to be dominated by either fiddlenecks or non-native grasses. Shrub areas provide nesting habitat for bird species including loggerhead shrikes (*Lanius ludovicianus*), as well as foraging habitats for small mammals and other species. Shrubs also may provide an important shade resource for reptiles to assist in thermoregulation.

Fallowed agriculture within the Project site encompasses the fallow orchards in the northwest corner of the site. Most of these trees were observed to be dormant/dead or exhibited very low growth, likely due to a lack of water. Trees are generally limited within the site, however, and these trees along with a few dead tree rows throughout the site may provide nesting habitat for passerines and larger bird species including raptors and common ravens. Denser tree rows and the orchard also provide habitat for desert woodrats (*Neotoma lepida*).

Annual grasslands and native herbaceous and scrub habitats are utilized by a wide variety of wildlife species. These areas may be used as nesting and foraging habitat by numerous bird species including western meadowlarks, California horned larks (*Eremophila alpestris actia),* and western burrowing owls (*Athene cunicularia hypugaea*), as well as larger raptor species. Common reptiles including side-blotched lizards, kingsnakes (*Lampropeltis* sp.), gopher snake (*Pituophis melanoleucus*), and Mojave rattlesnake (*Crotalus scutulatus scutulatus)* also may occur in these habitats, as well as in the adjacent scrub habitats. Common mammal species may include kangaroo rats (*Dipodomys* sp.), desert cottontail, black-tailed jackrabbit (*Lepus californicus*), California ground squirrel (*Otospermophilus beecheyi),* American badger (*Taxidea taxus*), coyote (*Canis latrans*), and kit fox (*Vulpes macrotis*).

The Project site includes two unnamed, intermittent drainages and two wetland features, including one seasonal wetland and one man-made retention pond that supports limited hydrophytic vegetation. Several man-made retention basins that showed no signs of supporting aquatic habitat also occur; these were treated as terrestrial habitat for the purposes of analyzing impacts to biological resources. Waters and potential wetlands features on site include:

- One unnamed, intermittent drainage, which enters the site at the southwest corner. This drainage receives flows from two pairs of culverts under 300th Street W and from the roadway and conveys flows southeast roughly parallel to the southern access road; these flows eventually disperse into rubber rabbitbrush scrub on the site.

- One unnamed, intermittent drainage, which begins on the north side of the southern access road on the site. This drainage receives flows from the southern access road and conveys them north and then east through the site, eventually conveying them off-site to feed another unnamed, ephemeral drainage approximately 1.65 miles east of the site.
- One seasonal wetland, located in the southwest corner of the site. Feature consists of a sparsely vegetated, shallow topographical depression with poorly defined edges, and appears to gather waters from the adjacent scrub. Vegetation consists of upland species. During excessive rain events, flows may overflow the southern end of the feature and enter the southwestern drainage.
- One man-made retention basin, which contained surface waters and showed signs of regular inundation. The basin is approximately 0.1 acres in size, supports sparse willows (*Salix* sp.) and limited cattails (*Typha* sp.), and is fed by a buried discharge pipe which originates at a nearby pump station.

Biological resources within the Project site were evaluated based on a literature review including a review of the California Natural Diversity Database (CNDDB) and field surveys of the Project site conducted in March and April 2017. Field surveys included reconnaissance-level biological surveys and a general habitat assessment with a focus on identifying habitats that may support special-status species, as well as vegetation community mapping. Protocol-level surveys for special-status species and formal jurisdictional delineations of the waters features were not conducted at this time.

2.5.1.1 Desert Tortoise

In response to California Department of Fish and Wildlife (CDFW) concerns regarding the potential for Project-related impacts to desert tortoise and desert tortoise habitat, an additional assessment of desert tortoise potential impacts to occur was conducted. No desert tortoise individuals or sign of desert tortoise (burrows/pallets, scat, tracks, egg shell fragments, shell/bone/scutes, or courtship rings, etc.) were observed within the Study Area or buffer during the 2017 field surveys. According to the USFWS, the Study Area occurs outside the range of desert tortoise in the western Mojave Desert (USFWS 2017). Habitat modelling conducted by Nussear *et al.* of the Mojave and Sonoran Deserts indicated that the Study Area is outside the western edge of occupied desert habitat, and that adjacent areas support very low quality habitat for this species (2009).

No CNDDB records for desert tortoise are documented within the Project USGS 7.5-minute quadrangle, or any adjacent 7.5-quadrangle. The nearest documented desert tortoise occurrence was recorded in 2010 within the Tylerhorse Canyon USGS 7.5-minute quadrangle, approximately 10.47 miles northeast of the Project site. The next nearest occurrence is approximately 20.9 miles northeast of the Project site and was recorded in 2006 in the Willow Springs quadrangle. Habitats within the Study Area are generally of poor quality for desert tortoise, lacking preferred habitats consisting of creosote brush scrub and blackbrush and juniper woodlands. In conclusion, due to the distance from recorded observations, lack of preferred habitats, and extent of range, desert tortoise is not expected to occur within the Study Area; therefore, the proposed Project is not expected to impact desert tortoise or its habitat.

To address CDFW concerns about impacts to fossorial species due to inundation of the basins, pre-inundation surveys will be conducted of the basins within two weeks prior to inundation by trained AVEK personnel. Although desert tortoise is not expected to occur, this species will be included as one of the target species during these surveys. Annual trainings will be conducted by a qualified biologist for all AVEK field personnel who may be conducting the pre-inundation surveys. Trainings will include a discussion of desert tortoise identification and sign, including burrow, recognition; their legal status and protections; and avoidance measures to be implemented if one is encountered on site. If any potential desert tortoise burrows are identified on site during pre-inundation survey or at any other time, the burrow(s) will be investigated further by a qualified biologist prior to inundation or any other disturbance.

2.5.1.2 Regional Development

The CDFW also raised issues regarding the ongoing development in the western Antelope Valley, which could lead to cumulative loss of habitats and biological resources, with a particular focus on the Centennial Ranch development. In response, the following narrative is provided.

Centennial Ranch is a 12,323-acre development proposed in the northwestern Antelope Valley. The Centennial Project Draft Environmental Impact Report (Draft EIR; SCH No. 2004031072) considered cumulative impacts in unincorporated County areas in the Antelope Valley Area Plan (AVAP) area, which includes the Project site, as well as Santa Clarita Valley, southern Kern County, and the cities of Lancaster, Palmdale, and Santa Clarita. According to Section 7.3.7 of the Draft EIR, potentially significant impacts to biological resources as a result of Centennial Ranch included impacts to native perennial grasslands, oak woodlands, drainages, special status plant and wildlife species, and wildlife movement. A more detailed assessment of Centennial Ranch's impacts on biological resources is available in that project's Draft EIR.

The Centennial Ranch Draft EIR acknowledges potentially significant impacts to biological resources including native plant and wildlife habitats as a result of ongoing development in the region. According to Exhibit 7-1 of the Centennial Ranch Draft EIR, the AVEK High Desert Water Bank is located within the Los Angeles County Cumulative Impact Area. Given the relatively small size of permanent habitat impacts on the Project site, the temporal nature of impacts due to inundation of the basins, and the inclusion of onsite habitat management lands, the Project's incremental effects are not expected to qualify as "cumulatively considerable" under Section 15130 of the CEQA Guidelines.

2.5.1.3 Common Species

Construction and operations associated with the proposed Project have the potential to directly impact common wildlife species, particularly species with relatively low mobility. These impacts may occur either through direct injury and/or mortality associated with collision with heavy equipment or through burrow destruction. The Study Area does support a number of burrowing rodent and small reptile species, which may be subject to such impacts. These species are common and abundant in the Project region; thus, impacts due to Project-related activities are not expected to be potentially significant. Suggestions to minimize impacts to common wildlife were recommended by the CDFW, although ultimately that agency concluded that no potentially significant environmental impacts requiring mitigation were anticipated. Nonetheless, efforts will be made during construction to avoid impacts to common wildlife where feasible.

2.5.2 CNDDB Review

A review of the CNDDB identified records for 12 special-status plant and wildlife species within 5 miles of the Study Area, including two plant species, one invertebrate, two reptiles, five birds, and two mammals. No records occurred within the Study Area boundary. Three species have records which occur within a 1 mile radius of the Study Area, including the following:

- **a.** Crotch bumble bee: One record is located approximately 0.35 miles southwest of the Study Area, on the western edges of the community of Neenach, and was recorded in 1976. One additional record occurs west of Quail Lake, approximately 5 miles west of the Project, and was recorded in 1976 (CDFW 2017a).
- **b.** Western burrowing owl: Four CNDDB records for western burrowing owls occur within 5 miles of the Study Area, the nearest of which occurs approximately 1 mile east of the Study Area and was recorded in 1999. The other three records are located between approximately 1.45 miles and 2.9 miles east of the Study Area, and consist of one record from 2007 and two records from 1999 (CDFW 2017a).

c. Tehachapi pocket mouse: There are five CNDDB records for Tehachapi pocket mouse within 5 miles of the Study Area. The nearest of these occurs approximately 0.65 miles south-southwest of the Study Area and was recorded in 1965. Other records are located in the foothills between 3.5 and 4.9 miles north of the Study Area and were recorded in 2001 (one record) and 2010 (three records) (CDFW 2017a).

A larger-radius search of CNDDB records within the Project and eight adjacent 7.5-minute quadrangles identified records for 55 special-status plant and wildlife species. Records included 19 plant species, three invertebrates, four amphibians, seven reptiles, 13 birds, and 9 mammals. A total of 11 sensitive natural communities also were identified. Extirpated records were excluded from analysis. The majority of these species inhabit foothill and mountainous habitats and have no potential to occur within the Project site, which occurs on the valley floor.

2.5.3 Field Observations

Field surveys were conducted during the growing season for most species, when the majority of plant species were in bloom and identifiable. Although portions of the Project site were historically disturbed, recolonization by native and naturalized plant species has allowed the re-establishment of potentially suitable habitats throughout the site. Wildlife observations, including nesting birds and burrowing small mammals, were common. As discussed, isolated trees, tree rows, and the fallow orchard, as well as large shrubs, provide habitat for common and special-status nesting bird species as well as perches for foraging shrikes and raptors. Power lines and larger trees throughout the site may support nesting by larger raptors and common ravens. Vegetation around the canal immediately south of the Project site tends to be denser than that on the site and is likely to support nesting; these species may forage within the grasslands and shrublands of the Project site.

As discussed, wildlife observations were generally of common species. Resident bird species were common throughout the Project site, and nesting by several of these species is expected, although not confirmed; these species include western meadowlark and white-crowned sparrows, as well as California horned larks, a California Department of Fish and Wildlife (CDFW) Watch List species. Nesting by northern harriers may occur in the vicinity of the fallowed orchards. Nesting by common ravens was observed within the Project site, as was nest building by loggerhead shrikes, a California Species of Special Concern. Many of these species are protected under the Migratory Bird Treaty Act (MBTA) and by the CDFW during nesting.

One State candidate species, tricolor blackbird (*Ageliaus tricolor*), was observed on an adjacent property, immediately south of the Project site. Tricolor blackbirds were observed foraging in an irrigated agricultural field and roosting in adjacent trees in a mixed flock with yellow-headed blackbirds (*Xanthocephalus xanthocephalus*) on the south side of the California Aqueduct. Nesting may occur in the vicinity of the aqueduct, although field surveys could not confirm this. This species may forage within the grasslands and fiddleneck fields of the Project site.

Construction of the proposed Project, including buried and aboveground pipelines, monitoring wells, groundwater recovery wells, and associated facilities, and approximately 1,200 acres of recharge basins, occurs throughout the annual grassland, fiddleneck field, and rubber rabbitbrush scrub throughout the Project site.

2.5.4 Potential Impacts

Based on the results of the CNDDB search and the field surveys, the Project site is known to or expected to support sensitive biological resources and native habitats which will be disrupted or removed by the proposed Project. Potential impacts include destruction of nests and disruption of natural nesting behaviors in nesting birds, including raptors, and removal of potentially suitable habitats for sensitive and special-status wildlife species, including American badger, desert kit fox, burrowing owls, and others.

2.5.4.1 Wildlife Habitat Removal

The Project would impact approximately 1,200 acres of potentially suitable foraging and sheltering habitats utilized by native wildlife species. Permanent impacts include those areas which would be developed to support groundwater recovery and monitoring wells, aboveground pipelines, and related infrastructure, and total approximately 12 acres. Temporary impacts include vegetation clearing, earthen berm construction, and regular, rotating inundation of the recharge basins, and would affect approximately1,200 acres of the site. Rotating inundation would temporarily remove an average of up to 400 acres of the recharge basins from use as habitat at any one time. Other temporary impacts include excavations and work areas associated with installation of the buried pipelines, and will affect approximately 70 acres of the site; these areas are expected to occur mostly within the recharge basin footprint.

Impacted habitats include native fiddleneck fields and rubber rabbitbrush scrub, and non-native annual grasslands, which are used by burrowing rodents, carnivorous and scavenging mammal species, passerines, raptors, and various reptiles. In addition to common wildlife species, special-status species with potential to be impacted by this habitat modification and loss include American badger (a California Species of Special Concern [CSC]), desert kit fox (species of local concern), western burrowing owl (CSC and U.S. Fish and Wildlife Service [USFWS] Bird of Conservation Concern [BCC]), tricolored blackbird (CSC and a State Candidate for listing), Swainson's hawk (State threatened), and Crotch bumble bee (CDFW Special Animal).

As discussed, recharge activities will inundate an average of up to 400 acres of the recharge basins at any one time. These activities will create shallow, temporary wet conditions within the basins, which will preclude use of the area by fossorial and ground-dwelling species. These conditions would be ephemeral and would not provide reliable, permanent mesic habitats; however, they may provide a temporary source of water for wildlife in the vicinity. Earthen berms may continue to provide habitat for burrowing rodents and other species. Habitat value will increase as these areas are naturally recolonized by native herbaceous and shrub and non-native grass species, providing forage and cover for small mammals and other species. However, inundation of the basins and maintenance of berms would limit the value of these habitats.

The proposed Project includes the permanent removal of a relatively small area of habitat (12 acres), and the temporary disturbance of a similarly small area totaling approximately 70 acres. Additionally, recurring temporary disturbance would affect approximately 1,200 acres of potentially suitable habitat consisting of the recharge basins, with temporary removal of on average up to 400 acres at any one time on a rotating basis. Regular inundation, berm maintenance, and other modifications including de-vegetation within the basins will decrease the quality of habitat for common and special-status native wildlife. However, similar native and naturalized vegetated habitats are common throughout the region and do occur on adjacent properties, and the proposed Project represents a relatively small portion of these areas.

In response to concerns by the California Department of Fish and Wildlife (CDFW) regarding loss of habitat for listed, candidate, and other special-status species due to Project-related activities, the Project shall include on-site habitat management lands on a portion of the 1,500-acre Project site. Habitat management lands shall encompass approximately 322 acres of the Project site and will include native and naturalized habitats including grasslands and shrublands, as well as protecting drainages and natural wetland features on-site. The protection of grassland and shrubland habitats is intended to provide foraging habitat for Swainson's hawk (*Buteo swainsoni*) and tricolored blackbird (*Ageliaus tricolor*), and foraging, sheltering, transitory, and breeding habitat for burrowing owl (*Athene cunicularia*), American badger (*Taxidea taxus*), and desert kit fox (*Vulpes macrotis*), as well as habitat for other native plant and wildlife species. Habitat management lands are located adjacent to the California Aqueduct and surrounding the waters and wetland features present within the Project site. The siting of habitat management lands as such provides movement and contiguous habitat corridors, as well as buffers and preserves waters and wetlands features. Habitat management lands will be managed by the Agency following guidance provided in a *Habitat Management Plan*,

2.5.4.2 Sensitive Habitats

No sensitive habitats including sensitive vegetation communities were observed within the Project site or in the immediate vicinity. Thus, no impacts to sensitive vegetation communities or other sensitive habitats are anticipated due to the Project.

2.5.4.3 Habitat Connectivity

The Project site does not occur within any County-designated Significant Ecological Areas (SEAs) or CDFW-designated Essential Connectivity Areas (ECAs). Construction of raised berms over approximately 1,200 acres of the site will reduce overall transitory and dispersal habitat quality and flooding of up to an average of 400 acres at any one time will regularly, if temporarily, obstruct dispersal and overland movements in those areas. However, even following implementation of the Project, the site remains highly porous to wildlife movement. Furthermore, adjacent properties are available and suitable for transitory movements and overland dispersal, so the reduction of dispersal habitat quality and regular temporary removal of overland dispersal habitat is not expected to significantly impact wildlife movement in the region.

2.5.4.4 Western Burrowing Owls

A review of the CNDDB (2017a) revealed four historic records for burrowing owls within a 5-mile radius of the Project site, including one record from 2007 and three from 1999. Burrowing owls were not observed during the field surveys, but the Antelope Valley does support a population of burrowing owls and the Project site does support potentially suitable habitat this species may use for nesting, foraging, and sheltering, including shrubland and grassland habitats. Small mammal burrows of suitable size were observed during the field survey.

Construction activities including vegetation clearing and ground disturbance could result in the removal of active nests if constructions occurs during the breeding season (April 1 through October 15 for this species), or occupied burrows at any time of year. As burrowing owls occur throughout the Antelope Valley at fairly low densities, disruption or loss of any nests is a potentially significant impact on the species. Surveys for burrowing owls prior to construction will avoid these impacts.

Implementation of the proposed Project will result in the permanent removal of approximately 12 acres of potentially suitable burrowing owl habitat and the temporary disturbance of an additional 70 acres. The

proposed Project also will result in modification of and recurring, rotational temporary impacts to approximately 400 acres within the total 1,200 acres of potentially suitable burrowing owl habitat to accommodate the recharge basins. Modifications will include temporary vegetation clearing and construction of approximately 40 miles of earthen berms, as well as rotating temporary flooding of the basins. Earthen berms are commonly utilized to support small mammal colonies, and burrowing owls may reside in burrows within the berms which are of suitable size. An average of approximately 400 acres of this modified habitat will be temporarily removed on a rotating basis due to inundation of the basins. Temporary removal of habitat is not expected to be continual, such that at many times the basins would be dry and available for use by small mammals and burrowing owls as sheltering and foraging habitat. , Periodic and short-term temporary inundation of the recharge basins would remove the basin floor as suitable habitat and destroy any burrows present.

The proposed Project includes the permanent removal of a relative small area of habitat (12 acres), and temporary disturbance to a similarly small area (70 acres). Rotating inundation of an average of 400 acres and other modifications of habitat will decrease the quality of habitat for burrowing owls. The presence of berm structures may provide an increase in small mammal burrow activity resulting in an increase of available burrow sites available for western burrowing owls. Similar native and naturalized vegetated habitats are common throughout the region and do occur on adjacent properties, and the proposed Project represents a relatively small portion of these areas. Further, habitat management lands will encompass approximately 322 acres of undisturbed native and naturalized habitats, which will support foraging, nesting, and sheltering by burrowing owls. If a burrow is occupied by a burrowing owl during inundation operations, impact through displacement of the individual may occur. Potentially fatal impact may occur if the individual is unable to escape the burrow during inundation of the basins. Mitigation measures including pre-inundation clearance surveys, annual trainings, and no-disturbance buffers, as described in Section 2.5.5.1, will minimize the potential for these impacts to occur. Thus, the proposed Project is not expected to significantly adversely affect burrowing owls through loss or modification of habitat.

2.5.4.5 Nesting Birds

In addition to the expected and known nesting by common and special-status bird species including common raven, California horned larks, and loggerhead shrikes, other bird species may utilize the Project site for nesting and foraging during the breeding season. Project construction activities which occur during the breeding bird season (February 1 through September 15) may destroy active nests of both ground- and shrub-nesting species and result in the injury or mortality of nestling and fledgling birds.

Project-related construction activities which occur during the breeding bird season also may temporarily disturb nesting birds in adjacent areas both on-site and on adjacent properties. Increased noise, vibration, and vehicle and human activity associated with construction of the proposed Project may disturb adult birds, resulting in the disruption of normal breeding behaviors including incubation of eggs and feeding and otherwise tending nestlings; in some cases, abandonment of active nests may occur due to disturbance. Pre-construction nesting bird surveys conducted prior to vegetation removal and ground disturbance during the nesting bird season will avoid these impacts.

Implementation of the Project would permanently remove approximately 12 acres and temporarily disturb 70 acres. The Project also would modify an additional approximately1,200 acres of potentially suitable grassland, herbaceous, and shrubland habitat for these species. Modification would include temporary vegetation clearing and construction of earthen berms, as well as rotating temporary flooding of the basins. Of the 1,200 acres of modified habitat, an average of up to approximately 400 acres would be

temporarily removed at any one time due to inundation of the basins. Sparsely vegetated berms and dry basins may provide nesting habitat for certain ground-nesting species including California horned lark and killdeer (*Charadrius vociferous*). Nesting habitat for shrub- and tree-nesting species will be reduced through vegetation clearance activities, although shrub species may naturally recolonize the earthen berms and provide potentially suitable nesting sites. Similar suitable native and naturalized herbaceous and shrub habitats are common in the region, including on adjacent properties, and the Project site represents a relatively small portion of these areas. Further, habitat management lands will encompass approximately 322 acres of undisturbed native and naturalized habitats, which will support foraging and nesting of native birds.

2.5.4.6 Wetlands and Waters

Two intermittent drainages and two potential wetland features were identified on the Project site. The only potential wetland feature which contained surface waters and showed evidence of regular inundation was a small man-made retention basin which contains sparse willows and limited cattails. Habitat value inherent in this feature is extremely limited due to its small size and the sparse quality of the supported vegetation. This feature is associated with operational infrastructure; the Project would not remove or alter this feature.

Both of the intermittent drainages identified within the site receive waters from off site. The eastern drainage conveys flows through the site and to join an ephemeral feature off-site; the western drainage's flows appear to dissipate into the uplands on-site. Disruption of these drainage features and the adjacent potential seasonal wetland may alter local drainage patterns within the site and on adjacent properties. Activities such as filling or blocking these features or diversion of flows may result in localized flooding or reduced flows in downstream features. Potential sedimentation of downstream features also may result if fill activities occur within the eastern drainage. To prevent these impacts, the Project intends to preserve the two intermittent drainages and the potential seasonal wetland within undisturbed habitat management lands.

As developed in this assessment, inundation basin construction will occur outside historic floodplain boundaries. To further ensure the Project does not constrain natural drainage migrations, a buffer of between 50 and 100 feet, as appropriate, will be established on both sides of the drainage features.

2.5.4.7 Special-status Plant Species

Special-status plant species are not expected to occur within the Project site based on a lack of observations during field surveys and absence of suitable habitats for special-status species recorded within a 9-quandrangle review of CNDDB occurrences. The CNDDB contains records for 19 special-status plant species within the Project 7.5-minute quadrangle and all adjacent 7.5-minute quadrangles. The majority of these species are foothill and montane species and were determined to have no potential to occur within the Project site, generally due to the Project site lacking suitable habitat types or occurring at unsuitable elevation. Three species were identified as having low potential to occur, including round-leaved filaree (*California macrophylla*), Tracy's eriastrum (*Eriastrum tracyi*), and Piute Mountains navarretia (*Navarretia setiloba*). Potential for these species was determined to be low due to soil types within the Study Area and the distance from known occurrences.

Although no special-status plant species were identified as having a moderate to high potential to occur, floristic surveys following established CDFW guidelines were not conducted of the Project site to definitively rule out their presence. If special-status plant species individuals or populations do occur within the Study Area, Project-related activities may result in impacts to individuals and suitable habitat. Impacts are expected to be relatively minor, however, due to the low likelihood that individuals or populations occur. Impacts could include removal of special-status plant individuals or populations where

they occur within the disturbance footprint, and loss of habitat due to Project construction. Floristic surveys will be conducted in the 2018 blooming season and impacts to individuals will be avoided wherever feasible. Should surveys identify individuals or a population of special-status plant species, appropriate translocation or enhancement/restoration efforts will be implemented, depending on the species identified and its location within the Project site. Seed bank salvage is readily available for annual herbaceous species; seed bank salvage or translocation may be implemented for perennial herbaceous species. Tree and shrub species may require outplanting or nursery-raised container plants. The CDFW has commented that sometimes it is appropriate to conduct enhancement of existing populations rather than planting population or individuals where they did not previously occur. If special-status plant species are identified within the Project site, subsequent relocation and/or enhancement actions will reduce impacts to less than significant. Habitat management lands will provide suitable upland habitat for any species that may be present. Factoring in the low potential for any special-status species to occur, and thus the low potential for Project site to support suitable habitat for these species, impacts to special-status plant species individuals and habitat are not expected to be significant.

2.5.4.8 Swainson's Hawk

Protocol surveys for Swainson's hawk were not conducted during the 2017 breeding season; these surveys will be conducted as described in Mitigation Measure BIO-8 during the 2018 breeding season. No Swainson's hawks or their sign were observed during the 2017 biological surveys, although potentially suitable grassland foraging habitat does occur within the Project site and this species has potential to occur. Suitable nesting habitat is extremely limited and of very low quality within the Project site, consisting of a limited number of utility poles and snags.

Because Swainson's hawks have extremely variable home ranges based on distribution of nesting sites and high-quality foraging habitat, amount of foraging habitat, and seasonal prey availability, it can be difficult to accurately estimate home range size. Ranges may be as small as several hundred acres up to almost 10,000 acres. This estimate was arrived at after review of the *Status Review of Swainson's Hawk in California* (CDFW 2016), which documents home ranges for Central Valley Swainson's hawks as ranging between 10.65 and 15.59 square miles (mi^2; 6,816 to 9,978 acres). For the purposes of assessing impacts, it is assumed that the Project site may occur within foraging habitat for up to two breeding pairs of Swainson's hawks. This is based on an estimated breeding season home range of approximately 1,600 acres (2.5 mi^2); because data was not available for the Antelope Valley population, a conservative estimate equal to approximately 25 percent of the low end home range of the nearest population (Central Valley) was used, in part because the Central Valley supports some of the largest home ranges documented.

As the average breeding season home range includes an estimated 1,600 acres, areas impacted by the proposed Project are not expected to significantly reduce foraging habitat for this species. The proposed Project includes only 12 acres of permanent impacts, which represents an insignificant portion of the total foraging range of a breeding pair and is not likely to be entirely composed of suitable foraging habitats, but likely will include some previously disturbed areas. Inundation of the basins may remove on average up to 400 acres at any one time, but this removal will be temporary in nature and irregular in timing. Open foraging lands will remain available surrounding the recharge basins. Further, temporary inundation of a portion of the basins will not preclude or have impact on foraging on the neighboring parcels. Regular Project operations are not expected to startle individuals such that their ability to forage would be interrupted or disturbed. Construction of the berms may support growth of small mammal populations by providing suitable burrowing habitat; these species are important breeding season prey for Swainson's hawks. Because nesting is not expected on-site and no nests were observed in the immediate vicinity during biological surveys in 2017, the Project site is unlikely to comprise the majority of any one pair's foraging habitat. Nonetheless, protection of approximately 322 acres of on-site foraging habitats as habitat management lands is expected to offset temporary loss of foraging habitat due to inundation.

2.5.4.9 Tricolored Blackbirds

Focused surveys for tri-colored blackbirds were not conducted in the 2017 breeding season; these surveys will be conducted during the 2018 breeding season as described in Mitigation Measures BIO-9. No tri-colored blackbirds were observed on the Project site during the 2017 biological surveys, and no potentially suitable nesting habitat for this species occurs on the Project site. However, tricolored blackbirds were observed in a mixed blackbird flock foraging on an agricultural property immediately south of the California Aqueduct adjacent to the Project site. According to the CNDDB, one nesting colony occurs approximately 2.55 miles west of the Project site and another is located approximately 2.8 miles east of the Project site. Although nesting is not expected due to a lack of suitable habitat, tri-colored blackbirds may utilize the Project site as foraging habitat.

For the purposes of assessing impacts, it is assumed that these documented colonies remain active, and that no nesting occurs closer to the Project site, including adjacent to the California Aqueduct. Tricolored blackbirds may forage up to 4 miles from their nesting colony; this represents a potential foraging range equal to 50.2 mi^2 (32,128 acres). In the vicinity of the documented nesting colonies, suitable foraging habitats primarily consist of active agricultural fields, grasslands, and shrubland on the valley floor and foothills. Currently, with the exception of the town of Neenach surrounding the eastern colony, the majority of the region supports open grasslands and mixed shrubland similar to habitats on the Project site, particularly to the north, where development is sparse and consists of only a few residences.

The majority of the Project site occurs within a 4-mile radius of both colonies; it is a minimum of 2.5 miles from the nearest colony. Project-related impacts will result in approximately 12 acres of permanent impacts, an insignificant portion of the total foraging range for this species. Temporary impacts to foraging habitat may include on average up to 400 acres of inundation at any one time; these impacts are rotational, irregular in timing, and are not expected to be continual, such that at many times the retention basins will be dry. Natural drawdown of inundation is expected to support growth of annual herbaceous plant species, which may provide forage for tricolored blackbirds if the species utilizes the Project site. Given the extent of temporarily disturbed areas verses the extent of potential, similar quality foraging habitat located a similar distance or closer to the colonies, the duration of temporary impacts, and the large foraging range of this species, temporary loss of on average up to 400 acres of potential foraging habitat at any one time is not expected to be significant. Further, protection of approximately 322 acres of habitat management lands is expected to sufficiently offset temporary foraging habitat lost to rotating inundation of the basins. Thus, significant impacts due to the proposed Project to tricolored blackbirds or their nesting or nesting season foraging habitat are not expected.

2.5.5 Mitigation

The following mitigation measures will be employed to minimize or avoid impacts to sensitive biological resources, including special-status species and waters features, within the Project site.

2.5.5.1 Potential Loss or Disturbance of Burrowing Owl Nests and Burrows During Construction

Construction activities may result in the removal or destruction of active burrowing owl nests or occupied burrows within the Project site, or the disruption of natural burrowing owl breeding behaviors. These losses could have a substantial adverse effect on the species, which occurs at low densities throughout the Antelope Valley. Appropriate mitigation and minimization measures shall be implemented to prevent adverse impacts to burrowing owls.

BIO-1 Burrowing Owls – Prior to ground-disturbing activities and other habitat disturbance, clearance surveys for active burrowing owl burrows shall be conducted of all areas subject to disturbance. Prior to

ground-disturbance associated with construction of the Project, including vegetation clearance and grubbing, preconstruction clearance surveys shall be conducted by a qualified biologist within the Project site and a 500-foot buffer of the site in order to locate active burrowing owl burrows. Pre-construction clearance surveys shall be conducted no more than two (2) weeks prior to construction. Surveys will be conducted following guidelines provided in the *Staff Report on Burrowing Owl Mitigation* (CDFW 2012).

Within two (2) weeks prior to inundation, trained AVEK personnel shall review all areas subject to inundation for presence of burrows with entrances suitable for burrowing owl occupation and potential burrowing owl sign. Any identified potentially occupied burrows will be investigated further by a qualified biologist prior to inundation. Training will be conducted by a qualified biologist for AVEK personnel who conduct pre-inundation surveys prior to the commencement of the first inundation survey. Training will discuss burrowing owl identification and sign and burrow recognition, their status, and the laws governing their protection. Training will be conducted by a qualified biologist on an annual basis for all Project operations personnel as a refresher.

If no burrowing owls are detected, no further mitigation will be required. If burrowing owls are observed during any survey, the following measures will be implemented:

- Occupied burrows will not be disturbed during the nesting season (April 1 through October 15).
- Occupied burrows will not be subject to inundation during operation of the water bank.
- Avoidance shall be the preferred approach for occupied burrows whenever feasible. If occupied burrows are observed during the non-breeding season (October 16 through March 31), a 160-foot buffer will be established; no construction or other physical work activities will occur within the buffer. If occupied burrows are observed during the breeding season (April 1 through October 15), and a 650-foot buffer shall be established; no construction or other physical work activities will occur within the buffer.
- When destruction of occupied burrows is unavoidable, destruction shall occur only during the non-nesting season (October 16 through March 31). Prior to destruction of occupied burrows within the Project site, any unsuitable burrows outside the disturbance footprint will be enhanced (enlarged, cleared of debris) to facilitate occupation.
- If owls must be moved away from the Project area, passive relocation techniques (e.g., installation of one-way exclusion doors at burrow entrances) will be used instead of trapping. ~~A~~ Passive relocation techniques will be employed for a minimum of one week in order to allow owls to acclimate to alternate burrows.

In order to provide protections for burrowing owls throughout construction and operations of the Project, a Burrowing Owl Protection Plan shall be developed prior to construction of the recharge basins. This plan will provide acceptable strategies for avoiding and minimizing impacts to burrowing owls and burrowing owl habitat on the Project site.

2.5.5.2 Potential Impacts to Desert Kit Fox and American Badger

Construction activities including ground disturbance may result in the destruction of active natal and non-natal desert kit fox and American badger dens if these dens occur within the Project site, as well as the injury of desert kit fox and American badger individuals. In order to avoid these adverse impacts, the following measure will be implemented:

BIO-2 Desert Kit Fox and American Badger – Clearance surveys for occupied desert kit fox and American badger dens shall be conducted prior to any Project disturbance activities, including initial construction and ongoing operations such as inundation of the recharge basins.

Within two (2) weeks prior to the start of construction, a qualified biologist shall conduct pre-construction clearance surveys of the work area and a 150-foot buffer for signs of desert kit fox and American badger, including active and inactive natal and non-natal dens, scat, prey remains, and tracks. All suitable denning locations shall be investigated for use.

Within two (2) weeks prior to inundation of the basins, trained AVEK personnel shall review all areas subject to inundation for potential sign of American badger or desert kit fox, including active and inactive natal and non-natal dens. Any identified potential sign of presence will be investigated further by a qualified biologist prior to inundation. Training will be conducted by a qualified biologist for AVEK personnel who conduct pre-inundation surveys prior to the commencement of the first inundation survey. Training will discuss American badger and desert kit fox identification and sign and den recognition, their status, and the laws governing their protection. Training will be conducted by a qualified biologist on an annual basis for all Project operations personnel as a refresher.

If dens are observed, the following measures will be implemented:

- Occupied dens will not be subject to inundation during operation of the water bank.
- Inactive dens shall be excavated by hand with a shovel to prevent badgers/kit foxes from re-using dens during construction.
- If active natal dens are observed during the survey, a buffer of 300 feet shall be established around the den; no construction or work activities will occur within the buffer. The den shall be monitored and the buffer maintained until a qualified biologist has determined that the den is no longer active, at which time it shall be excavated by hand to prevent re-use. Passive relocation of American badger and desert kit fox shall not take place while young are still in dens and dependent on the parents for food, or while females may be pregnant.
- If active, non-natal dens are observed within the Project site or buffer, badgers/kit foxes shall be discouraged from using these dens prior to clearing, grubbing, and/or grading of the site, by partially blocking the entrance of the den with sticks, debris, and soil for 3 to 5 days. Access to the den shall be incrementally blocked to a greater degree over this period, encouraging the badger/kit fox to vacate the den of its own volition. After badgers/kit foxes have stopped using active dens within the Project boundary, the dens shall be hand-excavated with a shovel to prevent re-use.
- If newly active badger/kit fox dens are found during construction activities, all work in the area shall cease until the biologist can safely close the den.
- If a desert kit fox or American badger is encountered during Project activities, all work that could result in a direct injury, disturbance, or harassment shall immediately stop and the Project biologist shall be notified.
- Where desert kit foxes have the potential to occur, all heavy equipment and vehicles left on-site overnight will be inspected at the beginning of each work day to verify that no individuals have taken shelter under the equipment. If a desert kit fox is observed, the project biologist shall be notified and the animal shall be observed from a distance until it has moved out of the area of its own accord.

2.5.5.3 Potential Impacts to Nesting Birds

Construction activities, such as vegetation clearing, ground disturbance via heavy construction equipment, and other activities, may inadvertently destroy active nests or disturb normal nesting and breeding behaviors when these activities occur within the breeding bird season (February 1 through September 15). To minimize these risks, pre-construction nesting bird surveys shall be conducted prior to initial ground disturbance and vegetation clearing when these activities occur within the breeding bird season.

BIO-3: Nesting Birds - If construction activities occur within the breeding bird season (February 1 through September 15), all vegetation clearing and initial ground disturbing activities will be preceded by a nesting bird survey. Nesting bird surveys will be conducted by a qualified biologist of all areas that may support nesting and will be subject to disturbance, as well as a 300-foot buffer for passerine species and 500-foot buffer for raptors. Surveys will be conducted no more than 7 days prior to construction activities.

- If an active nest is observed, a no-disturbance buffer will be established until a qualified biologist has determined the nest has either failed or has successfully fledged and the young are no longer dependent on the nest. The no-disturbance buffer will measure no less than 500 feet for raptors, and 300 feet for all other species.

2.5.5.4 Animal Movement and Entrapment

Wildlife species may use the open spaces within the Project site for dispersal and transitory movement, and may be subject to potential injury or entrapment in open trenches and open-ended pipes. To prevent entrapment, injury, and mortality, the following measures will be implemented:

BIO-4: Animal Movement and Entrapment (Trenches) - All trenches that are to be left open overnight shall be either securely covered or have wildlife escape ramps installed during non-work hours to prevent entrapment of common and special-status wildlife species. All steep-walled pipeline and utility trenches shall be inspected in the mornings and prior to backfilling to prevent mortality of common and special-status wildlife species. All entrapped wildlife shall be removed or allowed to escape voluntarily via escape ramps prior to construction resuming.

BIO-5 Animal Movement and Entrapment (Pipes) – All pipes, culverts, or similar structures on-site with a diameter of 2 to 24 inches shall be inspected for special-status species prior to moving or welding. Openings shall be capped or otherwise covered if sections cannot be inspected to prevent the entry and potential loss of wildlife. If a common or special-status species is discovered inside a pipe, the animal shall be safely removed by a qualified biologist. The pipe segment shall not be moved until the animal has escaped, or the pipe segment shall be moved a single time out of the path of construction. Alternatively, stored pipe may be kept capped at all times until used during construction. Vertical, open-ended pipes used as fence posts, property line demarcations, sign posts, etc., will be capped or otherwise plugged to prevent the entrapment and possible injury and mortality of wildlife.

2.5.5.5 Impacts to Waters and Wetlands

The Project site supports two intermittent streams and two potential wetland features. A formal jurisdictional delineation conducted in September 2017 (Part of Mitigation Measure BIO-10) of the drainages indicates these features are potential CDFW-jurisdictional streambeds, subject to CDFW regulatory authority under section 1600 *et seq.* of the California Fish and Game Code. The Project will not remove or alter these features; recharge basins and associated infrastructure will be constructed such that disruption of or impacts to drainages and potential wetlands are avoided.

Constraint of flows within the drainages, particularly where they cross open, relatively flat grasslands, could cause increased erosion and channelization of the features in these areas, as well as sedimentation of downstream waters. In order to avoid this potential impact, drainages will be protected within on-site habitat management lands that will be preserved and managed by the Agency. As discussed in Section 2.5.4.6, recharge basins will be constructed outside the historic drainages to preserve natural migratory movement of the streams and to prevent the constraint of flows where previously they dispersed over wide, flat plains. Further, a variable 50- to 100-foot buffer will be established along both sides of the drainages, and around the seasonal wetland feature. The buffer will be wider along portions of the drainage course where historic aerials show wider extents of inundation, and narrower where flows are naturally more restricted to the defined channel. Avoidance of construction within the channel and floodplain, and implementation of suitable buffers, will avoid impacts to waters and wetlands.

Thus, no impacts to waters of the State are anticipated. However, should the Project implementation require impacts to waters of the State, the Project will obtain all applicable regulatory permits prior to any fill or alteration of waters features, including submission of a Notification of Lake or Streambed Alteration application, in order to support the CDFW in determining the need for a Lake and Streambed Alteration

Agreement (LSA). Issuance of an LSA for the Project will require the CDFW, as a Responsible Agency, to ensure CEQA compliance, including employment of adequate avoidance, mitigation, monitoring, and reporting commitments associated with the LSA.

As discussed, the Project site supports two wetland features – one manmade retention basin that supports hydrophytic vegetation, and one potential seasonal feature. The Fish and Wildlife Commission "seeks to provide for the protection, preservation, restoration, enhancement and expansion of wetland habitat in California" as described in the Wetlands Resources Policy, and strongly discourages development in wetlands or conversion of wetlands to other land uses. Following these policies, the Project will not remove or alter wetland features within the Project site. The manmade basin occurs outside the disturbance footprint, and the seasonal wetland feature will be protected within habitat management lands.

In addition to any avoidance, minimization, or mitigation measures that may be required by issued permits, the following measures will be implemented to avoid impacts to waters from increased erosion or sedimentation due to Project related activities:

BIO-6: Erosion and Sediment Control - Best available erosion and sediment control measures will be employed to prevent downstream dispersal of sediments during and following Project-related activities. These measures may include sediment basins, gravel bags, silt fences, geo-bags, or gravel and geotextile fabric berms, erosion control blankets, coir rolls, jute net, and straw bales. The use of erosion control materials potentially harmful to wildlife species, including monofilament netting (erosion control matting) or similar material, will not be employed.

BIO-10. Jurisdictional Drainages and Wetlands - Prior to construction of the recharge basins or any ground-disturbing activities within waterways and wetlands on the site, a formal Jurisdictional Delineation will be conducted of all potential jurisdictional waters within the Project site. Fill or disturbance of any jurisdictional waters or wetlands will be permitted through the appropriate agency (i.e., Sections 401 and 404 of Clean Waters Act, or Section 1600 of California Fish and Game Code). Impacts to jurisdictional waters and wetlands will be avoided to the extent feasible, and shall not occur prior to issuance of any required local, state, and federal permits.

2.5.5.6 Impacts to Special-Status Plant Species

Construction and operations of the proposed Project have the potential to directly and indirectly impact special-status plant species individuals, populations, and suitable habitat if these species occur within the Project site. In order to avoid and minimize impacts to special-status plant species individuals and habitat within the Project site, the following mitigation measure will be implemented.

BIO-7. Special-Status Plants - Prior to construction of the recharge basins, floristic surveys shall be conducted of all potentially suitable habitats on the Project site. Floristic surveys shall be conducted by a qualified biologist following CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW 2009). If no special-status plants are observed, no further mitigation will be necessary. If special-status plants are observed during surveys, the following measures will be implemented:

- Individuals will be protected in place to the extent feasible through implementation of avoidance and buffers.
- If special-status plant individuals or populations must be impacted, individuals will be salvaged and/or transplanted to suitable habitat within the established on-site habitat management lands. If salvage is not feasible, mitigation at a 2:1 ratio will be provided within habitat management lands. In the case of annual species, top soil salvage may be employed to preserve the existing seed bank where appropriate enhancement of existing populations may be employed at the same 2:1 ratio.

2.5.5.7 Impacts to Swainson's Hawk

Construction and operations of the proposed Project may result in temporary impacts to Swainson's hawk foraging habitat if Swainson's hawks nests occur within the Project vicinity and the species utilizes the Project site as foraging habitat. To minimize impacts to this species, the following mitigation measure will be implemented:

BIO-8. Swainson's Hawk - Prior to construction of the recharge basins, focused Swainson's hawk surveys shall be conducted. Surveys for Swainson's hawk shall be conducted by a qualified biologist following the methods outlined in Swainson's Hawk Survey Protocols, Impact Avoidance, and Minimization Measures for Renewable Energy Projects in the Antelope Valley of Los Angeles and Kern Counties, California (CDFW 2010). Surveys shall include all potential Swainson's hawk nesting habitat within a 5 mile radius of the Project site. Surveys shall include all potential nest trees, towers or other potential nest sites (including nests used within the last 5 years) outside the nesting season for Swainson's hawk.

If no active Swainson's nests are observed, no further mitigation will be necessary. If an active Swainson's hawk nest is detected during focused surveys, the following measures will be implemented:

- No removal of active Swainson's hawk nests will be conducted during Project construction and/or operations.
- No construction activities will be conducted within a 0.5-mile radius of an active Swainson's hawk nest. Prior to construction activities, a qualified biologist will conduct a focused Swainson's hawk nest survey within an up to 0.75-mile radius of proposed construction activities to identify any active nests.
- If active Swainson's hawks nests are identified within a 0.5-mile radius of the Project site, a Habitat Management Plan will include specific, detailed measures to avoid and minimize impacts to Swainson's hawks in or near the Project site during both construction and operation of the Project.

2.5.5.8 Impacts to Tricolored Blackbirds

Construction and operations of the proposed Project may result in temporary impacts to tricolored blackbird nesting season foraging habitat, if tricolored blackbirds nest within the Project vicinity and the species utilizes the Project site as foraging habitat. To minimize impacts to this species, the following mitigation measure will be implemented:

BIO-9. Tri-colored Blackbirds - While the Initial Study indicates that impacts to tricolored blackbird foraging habitat due to Project-related activities are less than significant, at the request of the CDFW focused nesting season surveys will be conducted as follows: Prior to construction of the recharge basins, focused nesting tri-colored blackbird surveys shall be conducted of all potentially suitable nesting habitats and documented nesting colonies within the Project site and within a 3-mile radius of the Project site for any active nesting colonies.

2.5.5.9 Impacts to Habitat Availability

Construction and operations of the proposed Project will permanently remove approximately 12 acres and temporarily remove an average of up to 400 acres at any one time of native and naturalized habitats that may support native plant species and may be used for foraging, sheltering, breeding, and dispersal by native wildlife. In order to minimize these impacts, the following mitigation measure will be implemented:

BIO-11. Habitat Mitigation - AVEK will designate a significant allotment of land as habitat management lands. The purpose of these areas is to provide foraging habitat for Swainson's hawk, tricolored blackbird, nesting and foraging habitat for burrowing owl, and denning and foraging habitat for desert kit fox and

American badger. The details of the management of these lands will be described in a H*abitat Management Plan* to be prepared prior to construction of the recharge basins.

2.5.5.10 General Biological Measures

BIO-12 : General Biological Measures –

Worker Environmental Awareness Training - Prior to construction, a Worker Environmental Awareness Training shall be prepared and presented by a qualified biologist to all construction personnel at the start of Project-related activities. The training shall discuss sensitive-status species with the potential to occur within the Project footprint, including their regulatory status, description, and habitat requirements, and any sensitive habitat areas that may be encountered. The program shall emphasize the importance of minimizing disturbance, and describe the federal, state, and local regulations protecting biological resources and the potential penalties for non-compliance with these laws and statutes.

Equipment Staging - All construction equipment, staging areas, materials and personnel shall be restricted to existing roadways and road shoulders, designated work areas, or previously disturbed off-site areas that are not habitat for special-status species.

Site Cleanliness - All trash and food items shall be contained and removed from the site regularly to prevent attracting predators and scavengers, such as dogs, coyotes, desert kit fox, or common ravens, to the Project area.

Hazardous Waste Cleanup - Any spills of petroleum products or other chemicals, which may represent a hazard to wildlife, shall be cleaned up promptly and in accordance with appropriate laws and regulations.

2.5.6 CEQA Significance

Based on the analysis of the potential effects of the proposed project, the Initial Study concludes that with Mitigation Measures in place, the impact to biological resources will be less than significant and that the project:

a. Would not 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 by the California Department of Fish and Game or U.S Fish and Wildlife Service.

No federally- or State-listed species were observed within the Project site. Although one State candidate, tricolor blackbird, was observed on an adjacent property, the Project site does not support suitable nesting habitat for this species, and foraging habitats are common in the vicinity. Implementation of appropriate mitigation measures including pre-construction survey for nesting birds, active burrowing owl burrows, and active desert kit fox and American badger dens, will avoid direct adverse impacts to special-status species, should they occur within the Project Area.

Impacts to suitable habitats for native common and special-status plant and wildlife species as a result of construction of the proposed Project include the permanent removal of approximately 12 acres and temporary impacts to approximately 70 acres of suitable habitat, as well as construction of approximately 1,200 acres of recharge basins. Operations associated with inundation of the basins will periodically, temporarily remove an average of up to 400 acres of habitat at any one time. These impacts are rotational, irregular in timing, and are not expected to be continual; the majority of the basins will remain available for use as foraging and transitory habitat by native wildlife. Because special-status plant species are not

expected to occur, impacts to special-status plant species habitats are not expected to be significant. Nonetheless, habitat management lands will provide approximately 322 acres of undisturbed native and naturalized vegetation communities that will provide habitat for both common and special-status plant and wildlife species within the Project site. Similar habitats also are common within the Project vicinity. Thus, loss of habitat due to permanent impacts associated with the Project and temporary loss due to inundation of the recharge basins does not represent a substantial impact to any species. Therefore, the proposed Project will not have substantial adverse effects on any listed, candidate, or special-status species.

b. Would not 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 of U.S. Fish and Wildlife Service.

No sensitive natural communities occur within the Project site.

c. Would not 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.

No federally protected waters occur within the Project site. None of the potential wetland and waters features exhibit hydrologic connection to any Traditional Navigable Waters (TNWs). Thus, there will be no impacts to federally protected wetlands.

d. Would not interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with the established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

The Project will not substantially impact overland migratory, transitory, or dispersal movements by native wildlife, and no aquatic features capable of supporting wildlife migration occur within the Project site. The Project site does not occur within any major regional wildlife movement corridors or habitat linkages. Although the Project will modify approximately 1,200 acres of potentially suitable transitory and dispersal habitat, similar open habitats are available on adjacent properties and wildlife movement between adjacent habitats and within the region as a whole is not expected to be substantially impacted. No wildlife nursery sites occur within or in the vicinity of the Project site; thus, the proposed Project will not impede use of any nursery sites.

e. Would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

The Project does not conflict with any local policies or ordinances protecting biological resources.

f. Would not 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 Project occurs within the area covered by the Antelope Valley Areawide General Plan, developed under the jurisdiction of Kern, Los Angeles, and San Bernardino Counties, and in the area covered by the West Mojave Plan, issued by the U.S. Bureau of Land Management with cooperation from USFWS, CDFW, CalTrans, and various local jurisdictions. However, it does not

occur within or adjacent to any areas identified as Significant Ecological Areas and, with mitigation, will not impact species covered by the West Mojave Plan. Thus, there will be no conflicts with existing conservation plans.

2.6 Cultural Resources

The following discussion is from the April 2017, Archaeological Phase I Report[3]. Refer to Appendix E.

2.6.1 Introduction

Prehistoric human settlement patterns in the Mojave Desert have been influenced by a dry and arid environment. High mountain peaks of the Sierra Nevada to the north and the San Gabriel Mountains to the south create a barrier against westerly precipitation, resulting in a rain shadow for the Mojave Desert Block.

Archaeological investigations have indicated that, although the area had limited prehistoric resource and surface water, the region supported a long and occasionally dense human population (Moseley and Smith 1962). Archaeological remains tend to be widely scattered and sparse, and are usually located along the margins of pluvial lakes (Warren 1990). Although research in the Mojave area has produced a wide array of cultural sequences, for the purpose of this section, a broad terminology is used to provide temporal context to the region. The sequence consists of the Paleoindian, Pinto, Gypsum, Rose Spring, and Protohistoric period.

2.6.1.1 Paleoindian Period (12,000 to 7,000 years B.P.)

This period is the earliest documented evidence of human occupation in the Mojave Desert and has been referred to as the Western Pluvial Lakes Tradition (WPLT) (Sutton 1991). The WPLT encompasses a broad geographic region from the western Great Basin to southern California and north to Oregon. Evidence suggests that Paleoindian period population groups were highly mobile, with settlement patterns that reflect a dependency upon lacustrine resources (Sutton 1991; Sutton et al. 2007; Warren 1990). This cultural adaptation to pluvial conditions (e.g., lakes, marshes, and grasslands) flourished for several millennia around 10,500 B.P. but then disappeared during the warmer and more arid conditions of the Middle Holocene (Moratto 1984).

The Lake Mojave complex is one of the most recognized lithic complexes of the WPLT. These assemblages are typically characterized by foliated points and knives, Lake Mojave points, Silver Lake points, and flaked stone crescents. Materials dating to the Paleoindian period in the western Mojave Desert are few and confined to the dry lake beds in the Antelope Valley. To date, none have been identified in Western Mojave (Sutton 1991).

2.6.1.2 Pinto Period (7,000 to 4,000 B.P.)

A period of dramatic environmental change has been posited for the Pinto period. The environment changed from pluvial to arid conditions; rivers and lakes dried up and animal and plant life changed. This period is seen by Warren (1984) as marking the beginnings of cultural adaptations to the desert. People either adapted to this change or relocated to areas with more favorable environmental conditions. This depopulation of the area seems evident in the small size of Pinto period sites, which are often limited to surface deposits. These ephemeral sites suggest temporary or seasonal occupations by small groups of people (Moratto 1984), focusing on a forager-like strategy (Sutton et al. 2007).

The most important distinction of Pinto period assemblages relates to an increase in the abundance of groundstone implements (Sutton et al. 2007). The appearance of significant numbers of milling stones in Pinto assemblages is attributed to the exploitation of hard seeds, which is seen by Warren (1984) as part of the process of subsistence diversification brought on by the increased aridity and decreasing game

populations. No confirmed Pinto period sites are known in Western Mojave although a few Pinto-style projectile points have been identified in the Tehachapi area and other parts of the western Mojave (Sutton 1988).

2.6.1.3 Gypsum Period (4,000 to 1,500 B.P.)

The Gypsum period is marked by an increase in the number of archaeological components, and increased diversity in assemblage and site setting. Occupations in the Western Mojave during this period are indicative of large permanent or seasonally occupied villages, with smaller, seasonally based, special purpose sites including rock rings, lithic scatters, and milling stations (Sutton 1980; Warren 1986). The appearance of a large village and special purpose sites in the Antelope Valley has been attributed by Warren (1986) to refined hunting methods and seed processing technologies that raised the regional carrying capacity and facilitated population growth.

Gypsum period assemblage sites are characterized by diagnostic projectile points, leaf-shaped points, rectangular-based knives, flake scrapers, T-shaped drills, large scraper-planes, choppers, and hammerstones. There is an increase in the presence of milling stones, and the mortar and pestle were introduced during this period.

2.6.1.4 Rose Spring Period (ca. 1,500 to 1,000 B.P.)

Archaeological evidence for the Rose Spring period indicates a major population increase, changes in artifact assemblages, and well-developed middens (Sutton 1988). The introduction of small projectile points into assemblages in the Mojave Desert and the Great Basin appear to mark the introduction of the bow and arrow and decline of the atlatl and spear weaponry (Sutton 1996).

Subsistence strategies seem to shift toward the exploitation of small to medium-sized game, including lagomorphs and rodents. The milling of plant foods was an important activity with numerous bedrock milling features at Rose Spring, including mortars and slicks (Sutton 1988).

2.6.1.5 Protohistoric Period (1,000 B.P. to the time of European contact)

There is an increase in the ethnic and linguistic complexity within the Mojave Desert during this period. Desert Side-notched points and Brownware ceramics become more widely distributed throughout the Mojave Desert and the Great Basin. This development, combined with linguistic evidence, is associated with the Numic-speaking Paiute and Shoshone expansion throughout most of the area (Bettinger and Baumhoff 1982).

Characteristic artifacts of this period include Desert series projectile points (Desert Side-notched and Cottonwood Triangular), Brownware ceramics, Lower Colorado Buff Ware, unshaped hand stones and milling stones, incised stones, mortars, pestles, and shell beads (Warren and Crabtree 1986).

2.6.2 Cultural Field Surveys

A Phase I cultural resources intensive pedestrian survey was conducted to determine the location of unknown cultural resources in the Project area. Sites identified during the surveys were documented in detail to allow for the completion of all appropriate Department of Parks and Recreation (DPR) 523 forms. Minimally, these include primary forms (Form 523A) and location maps overlaid on a USGS topographic map (Form 523J). More complex resources potentially require an Archaeological Site Record (Form 523C), Linear Feature Form (Form 523E), and/or a Sketch Map (Form 523K). Sketch maps included a site datum, features, artifacts concentrations, and other cultural elements. Isolated finds were noted and their location mapped with a hand-held GPS. In addition to the information required for DPR site forms, detailed field notes were produced for each site. Field notes described site impacts, geology, and vegetation, and contained diagnostic information about cultural materials at each site.

The survey conducted within the Project Area identified two archaeological isolates (PD-1 and PD-2) as well as four archaeological sites (PD-3, PD-4, PD-5, and PD-6). A previously recorded site, PD-7, is a section of the East Branch of the California Aqueduct and was updated as much as possible given land access restrictions. Each resource is described below. Further information is available publicly in the cultural resources phase I (AECOM 2017) report in Appendix E.

2.6.2.1 Isolate PD-1

PD 1 is an isolated possibly silicified sandstone tertiary flake. It has a simple dorsal surface with a prepared platform. The flake measures 3 centimeters (cm) x 2 cm x 0.8 cm and is white-brown in color.

2.6.2.2 Isolate PD-2

PD 2 is an isolated chert tertiary flake. It has a simple dorsal surface with a prepared platform. The flake measures 2.5 cm x 3 cm x 0.4 cm and is white-tan in color.

2.6.2.3 Site PD-3

Site PD 3 consists of a water catch basin compound composed of eight associated features:

- Feature 1 – a water catchment basin;
- Feature 2 – a concrete pad;
- Feature 3 – another concrete pad;
- Feature 4 – a third concrete pad;
- Feature 5 – four cinder block wall segments;
- Feature 6 – a concrete pipe pile;
- Feature 7 – a water valve; and
- Feature 8 – a concrete anchor block.

Feature 5 makes up the northern boundary, Feature 7 marks the southern boundary, Feature 1 delineates the eastern boundary, and Feature 8 is the western boundary. Feature 5 appears to mark the entrance into the facility for water irrigation distribution. The concrete pads that make up Features 2, 3, and 4 are located east of the entrance. Feature 2 is the second largest of the three concrete pads and is rectangular in shape with the presence of threaded-mounting bolts around its perimeter and cut conduits along its western and southern sides. This pad is likely for an office trailer as there is a telephone box situated along the south side with a ramp along the north side and a step located on the south end. Feature 3 is the largest of the concrete pads with two mounting bolts and brackets attached along the south end. Features 2 and 3 are located at the east base of the water catchment (Feature 1). Feature 4 is the smallest of the concrete pads and is constructed in four segments that vary in length and is stacked six courses high. The top course consists of decorative cinder blocks. Feature 6 is located at the northeast end of Feature 1 water catchment and consists of a large pile of concrete pipe present among various debris such as wood and sparse scatter of glass fragments. Feature 7 is southwest of Feature 1 and consists of a water valve that is in line with two aboveground vertical pipes embedded in a concrete pad. Feature 8 is a concrete anchor block. The site measures 369 feet north-south by 407 feet east-west and is less than 1 mile northwest of the California Aqueduct. The compound appeared to have been purposely destroyed and abandoned but it is unclear when this took place. It is possible that the site once served as a maintenance facility associated with the SWP.

Review of historic aerials and topographic maps show that the water catchment basin (Feature 1), was present as early 1971. In addition, the maps show that the area surrounding the site has been utilized as agricultural land dating back to at least 1952 with the notation “Wheat” on the 1967 topographic map. It is unclear whether the other seven features recorded within Site PD-3 date to the same period.

2.6.2.4 Site PD-4

Site PD 4 consists of three features:

- Feature 1 – water catchment;
- Feature 2 – refuse scatter; and
- Feature 3 – unlined earthen water drainage ditch.

Detailed descriptions of PD-4 features are as follows:

Feature 1 consists of a water catchment basin that measures 200 feet east-west by 164 feet north-south and approximately 4 feet in height at the northern end, with a depth of approximately 6 feet. The feature is located at the southern end of a slight rise that faces south. The southern end of the feature appears to have been excavated and the soil was used to create the berms along the eastern and southern sides of the feature. At the northern and western sides, two additional curved berms are present and appear to serve as a means to capture water that enters from the earthen ditch or water channel. There is an opening at the southern end of the upper berms that allows water to flow into the southern catchment area. The western and northern walls of the feature appear to be natural topography and the interior of the southern and eastern walls appear artificially constructed. Visible disturbances to the feature consist of motorized dirt bike and quad tracks that have created depressions within the feature.

Feature 2 consists of a historic refuse deposit in a pit measuring 5 feet by 5 feet. The refuse consists of 23 food and liquid cans that vary in size with rotary and 2-hole punch openings; one green glazed ceramic tableware that may be fragments of a cup; one amber-colored and five clear-colored glass bottle body fragment; and one truck or trailer siding part. None of these consumer and household related resources exhibited datable attributes.

Feature 3 consists of an unlined earthen water ditch that measures 213 feet in length by 63 inches wide and is approximately 13 inches deep. The water ditch channels water from up the slope into Feature 1 water catchment basin. At the north end of the feature, the ditch merges with a north-south–trending irrigation ditch just west of the road.

Review of historic USGS topographic maps (U.S. Department of Interior Geological Survey 1949 and U.S. Department of Interior Geological Survey 1965), resulted in the possible identification of Site PD-4. Here there are possible structures that appear on USGS maps between 1949 and 1965 labeled as Wheat. Also known is that the land on which the site is situated was utilized for agricultural purposes and/or kept undeveloped as early as 1943. As such, it’s likely possible that Site PD-4 is associated with agricultural activities and/or used as a dump site.

2.6.2.5 Site PD-5

Site PD 5 consists of a triangular-shaped water storage feature, which is visible on aerial photographs as early as 1952. The feature measures 90 feet northwest-southeast by 49 feet northeast-southwest. A portion of the northeast edge was excavated and the soil is built up in the center of the eastern edge. The northeastern berm is less defined due to disturbance. On the northeastern interior edge of the berm, approximately 9 feet, is a water well vent. In addition, refuse and debris were scattered around a tree located 9 feet north of the feature composed of steel pipe, concrete, brick, modern glass bottles, sofa springs, a recliner chair, and shotgun shells.

2.6.2.6 Site PD-6

Site PD 6 consists of small household and automotive refuse scatter that includes one clear drinking glass fragment, one Pyrex food container, one automotive windshield piece, clear mason jar fragments,

and fragments of stoneware ceramic fragments. The artifacts date to the 20th century, but otherwise none have diagnostic attributes. Review of aerial and topographic maps do not show any developments where the site is situated. It is likely that the refuse scatter is a result of roadside dumping activities as there is a roughly northwest-southeast–trending road that loosely parallels the aqueduct just south of the site.

2.6.2.7 Site PD-7 (P-19-004154)

Archeological site PD-7 was initially recorded in 2009 and designated as site P-19-004154. The resource consists of a segment of the East Branch of the California Aqueduct that was constructed between 1966 and 1973. The portion of the resource encountered consisted of two bridges for vehicular access, one siphon and one spillway. Due to restricted access to the resource, the recordation of the resource was limited to photographic documentation. The East Branch was evaluated as part of a 2009 documentation, for historical significance under the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR) criteria as a water conveyance system in California. According to that evaluation, the East Branch appears eligible for both the NRHP and the CRHR under Criterion 1/A for its association and contribution to the development of water systems in the state of California. In addition, it appears eligible for both the NRHP and the CRHR under Criterion 3/C for its engineering design.

2.6.3 Potential Impacts / Site Significance Evaluation

2.6.3.1 Isolate PD-1

Isolate PD-1 is an isolated sandstone tertiary flake with no practical or temporal diagnostic characteristics. It does not, nor does it have the potential to, yield information important for the prehistory of the area, California, or the nation. It is recommended as not eligible for listing. Accordingly, it does not meet any of the criteria for the CRHR.

2.6.3.2 Isolate PD-2

Isolate PD-2 is an isolated sandstone tertiary flake with no practical or temporal diagnostic characteristics. It does not, nor does it have the potential to, yield information important for the prehistory of the area, California, or the nation. Accordingly, it does not meet any of the criteria for the CRHR. Therefore, it is recommended as not eligible for listing under CRHR criteria.

2.6.3.3 Site PD-3

Site PD 3 consists of a water catch basin compound composed of eight associated features. Regardless of similarity, the site is located too far from the California Aqueduct to have been directly associated. It is most likely related to agriculture. The site is not associated with individuals or events that directly add to the important narrative of California or national history nor does it embody distinct characteristic of form. Additionally, PD-3 does not have any distinctive historical association and does not contain important information. Accordingly, it does not meet any of the criteria for the CRHR and is recommended as not eligible for listing.

2.6.3.4 Site PD-4

This site consists of mostly a water catchment basin with a few historical associated features. The features at PD-4 do not directly add to the important narrative of California or national history nor does it embody distinct characteristic of form. Accordingly, it does not meet any of the criteria for the CRHR and is recommended as not eligible for listing.

2.6.3.5 Site PD-5

Although this feature is visible on USGS maps starting in 1952, the water catchment feature is not diagnostic enough to warrant eligibility as being important enough to add to our knowledge in history of this time period. PD-5 does not directly add to the important narrative of California or national history nor does it embody distinct characteristic of form. Accordingly, it does not meet any of the criteria for the CRHR and is recommended as not eligible for listing.

2.6.3.6 Site PD-6

This refuse scatter does have some artifacts that are potentially diagnostic to specific regions or general eras of time in production. However, none of the artifacts have distinct makers marks associated with diagnostic historic artifacts. Regardless of this fact, the artifacts at PD-6 are not important enough to add to the literature already in place in the region to be eligible under any criteria for the CRHR. Therefore, PD-6 is recommended as not eligible for listing.

2.6.3.7 Site PD-7

Site PD-7 (P-19-004154) consists of a segment of the East Branch of the California Aqueduct that was constructed between 1966 and 1973. The East Branch was evaluated as part of the 2009 documentation, for its historical significance under the NRHP and CRHR criteria as a water conveyance system in California. According to that evaluation, the East Branch appears eligible for both the NRHP and the CRHR under Criterion 1/A for its association and contribution to the development of water systems in the state of California. This is agreed upon here for the CRHR that because of the importance of water resources to the history of Los Angeles, southern California, and California as a whole, and its relation to the nation, site P-19-004154 (PD-7) is recommended eligible for listing in the CRHR under criterion 1.

2.6.4 Management and Mitigation

Sites and isolates PD-1 through PD-6 are not eligible for the CRHR. No further work is necessary for the recorded components of these sites.

Previously recorded site P-19-004154 (PD-7) is recommended eligible under the CRHR. The proposed Project components will affect the East Branch of the California Aqueduct for turnout installation. However, this work does not affect site eligibility under criterion 1. The site still serves its purpose of being a significant reminder of history and current supplier of water for the Los Angeles area. It is still recommended that impacts are mitigated as much as possible during installation and that part time monitoring occur during construction activity on this site.

Based on the results of the archival research, Sacred Lands File search with the Native American Heritage Commission and pedestrian survey there is low to moderate potential that archaeological including Native American cultural resources will be encountered during ground-disturbing activities for the Project. Such resources may lie beneath the surface, obscured by pavement, vegetation, or development. Because the potential to encounter archaeological resources exists for the proposed Project, the Agency shall use part time archaeological and Native American monitoring during ground-disturbing activities, including, but not limited to, trenching, boring, and grading. If the qualified archaeologist discovers artifacts of significant importance and deems the level of sensitivity for cultural remains to be changed from low to moderate to high, particularly due to disturbances within younger Quaternary deposits, monitoring in that area may be increased as deemed necessary by the archeologist.

The Agency will use the following mitigation measures to lessen the impact of significance to cultural resources.

CR-1: Cultural Resources Monitoring – The Project site has been identified to have a low to moderate potential of finding significant archaeological resources lacking surface manifestations that may be

encountered during Project construction. To lessen the impact of unknown archeological resources, the Agency will develop a Cultural Resources Monitoring and Mitigation Plan prior to start of ground disturbance. This plan will implement part time monitoring by a qualified archeologist and or a Native American Monitor. In the event that project construction activities result in a finding of significant importance, the qualified archeologist may increase the level of monitoring. If no findings occur during the part time monitoring, the archeologist may further reduce or eliminate the monitoring. During a find of a potentially significant archaeological resource, the resource will be inventoried and evaluated to ascertain whether the resource meets the criteria for listing on the California Register of Historical Resources. After the discovery, all work being conducted within the vicinity of the discovery will be halted or diverted away from the site of discovery until a qualified archaeologist can assess the potential significance of the find.

CR-2: Regulation Compliance – The Agency will comply with Health and Safety Code Section 7050.5, CEQA Section 15064.S(e), and Public Resources Code Section 5097.98, which mandate the process to be followed in the unlikely event of an accidental discovery of any human remains in a location other than a dedicated cemetery.

2.6.5 CEQA Significance

Based on the analysis of the potential effects of the proposed Project, the Initial Study concludes that with mitigation measures in place, the impact to cultural resources will be less than significant and that the Project:

a. Would not cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5

b. Would not cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5.

a & b - Buried cultural resources may possibly be affected by the Project, however, the incorporation of management and monitoring protocols will reduce this to less than significant. In addition, the construction of turnout attachments to portions of the East Branch of the California Aqueduct (P-19-004154) will not affect site significance as its integrity as an important historical resource that continues to supply water to the Los Angeles area is maintained.

c. Would not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

d. Would potentially disturb any human remains, including those interred outside of formal cemeteries

c & d- The Project may potentially affect human remains. However, if human remains are discovered, all procedures pursuant to CEQA Guidelines 15064.5, PRC section 5097.98, and Safety Code of Regulations 7050.5 will be maintained. This reduces the potential to a less than significant status.

2.7 Geology and Soils

2.7.1 Introduction

2.7.1.1 Soils

The proposed Project is located within the West Antelope and Neenach subunits of the Antelope Valley Groundwater Basin. The majority of the soils within these subunits are in hydrologic soil group A and C. Group A soils have a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission. Group C soils have a slow infiltration rate when thoroughly wet. These consist chiefly of soil having a layer that impedes the downward movement of water or soils that have moderately fine to fine texture. Refer to Figure 6 in Appendix A for a depiction of the location of the different soul units as designated by the Soil Survey Maps from the United States Department of Agriculture National Resources Conservation Service.

2.7.1.2 Seismic Hazards

The proposed Project is in an area of relatively high seismic activity. The Garlock fault along the Tehachapi Mountains lies approximately 9 miles north of the Project site. The San Andreas Fault along the San Gabriel Mountains lies approximately 4 miles south of the Project site. None of these fault zones crosses any of the facilities proposed for the Project. Refer to Figure 7 in Appendix A.

The Garlock and San Andreas faults are designated as Fault-Rupture Hazard Zones under the Alquist-Priolo Fault Zoning Act. The Project facilities would not be within any currently designated Fault-Rupture Hazard Zones. The general Project area has been subject to intense ground shaking from nearby fault ruptures, particularly on the San Andreas Fault and on faults near the juncture of the San Andreas and Garlock faults. Historical data of active seismic activity in the area specifically along the San Andreas Fault show earthquake activities ranging in scale of 6.5 in the Palmdale earthquake of 1971, 7.5 in the Wrightwood earthquake of 1812, and 8.0 in the Fort Tejon earthquake of 1857.

Earthquakes generate ground shaking. In areas with wet soils, this movement may cause soils to become suspended in water or "liquefied". When soil liquefies, it loses strength and behaves as a viscous liquid (like quicksand) rather than as a solid. This can cause structures to sink into the ground, tilt, or rupture. Sloping areas slump and even level ground may move sideways.

Liquefaction effects are difficult to estimate precisely because they depend on the interaction of soil type, age, saturation level, depth to groundwater, earthquake source, earthquake path, and specific site processes. Nevertheless, basic approaches to evaluating liquefaction susceptibility are well established, and reasonable judgments about relative impacts can be made based on soils characteristics and depth of groundwater. For example, Knudsen et al[15] (Cited in ABAG 2001)[1] evaluated liquefaction potential on a qualitative scale (very high to very low) for soil types versus depth to groundwater in the San Francisco Bay area. In general, this analysis notes that potential liquefaction effects are low to very low when depth to groundwater is greater than 30 feet, and consistently very low for depths to groundwater of greater than 50 feet. Key findings related to soil/depth relationships were

- For recent stream channel deposits, liquefaction potential is very high at < 10 feet, high for depths of 10 to 30 feet, and moderate for depths of 30 to 50 feet,
- For alluvial fan deposits, liquefaction potential is moderate to high at < 10 feet, moderate for depths of 10 to 30 feet, and low for depths of 30 to 50 feet; and
- For alluvial terrace deposits, liquefaction potential is high for depths from 0 to 30 feet and moderate to low for depths of 30 to 50 feet.

Based on these considerations, it is reasonable to conclude that liquefaction potential is a concern when depth to groundwater is about 30 feet. At 50 feet, potential liquefaction effects are very low, even for unconsolidated sandy soils. The potential for liquefaction to adversely affect human safety is related to liquefaction potential and the proximity of development to areas of high groundwater. Groundwater depth in the proposed Project area varies, but based on recent measurements groundwater levels in the Project area range from 280 to 300 feet below ground surface.

2.7.1.3 Regulatory Environment

Impacts to soils and geology are subject to a number of regulatory requirements. Soils are considered an important natural resource and wind and water erosion are considered both a loss of this resource and a potential public health and safety issue. Erosion by wind is subject to local and regional controls, primarily under the guidance of the Antelope Valley Air Quality Management District (AVAQMD), which regulate fugitive dust emissions. Erosion due to water is under the regulation of the Lahontan Regional Water Quality Control Board. Loss of soils due to erosion is addressed in the air quality and water quality sections of this Initial Study. Seismic hazards are addressed in local, county, and State building codes and regulations.

2.7.2 Potential Impacts

2.7.2.1 Soil Erosion During Construction and Operation

Soils of the alluvial plain of the Antelope Valley are highly susceptible to water and/or wind erosion. Grading in periods of winds in excess of about 10 miles per hour could therefore cause erosion. The approach to berm construction for the proposed Project will not result in the substantial removal of top soils and will minimize the area of soils affected by this aspect of construction when compared to traditional engineered recharge basin construction. Pipeline, pump station, turnouts, and storage construction will result in excavation, temporary side casting of soils, and then backfilling of the trench. Excess spoil from construction and excavation from the pipelines, pump station, turnouts, and storage facilities may be stockpiled, made available to others, and/or spread on recharge areas where sheet flow from precipitation may, occasionally result in minor erosion.

Over the long term, some loss of soil could occur during annual reconstruction of berms. During periods of recharge, soils would be covered by water minimizing the potential for wind and water erosion. During non-recharge periods, the potential for wind and water erosion is no different than existing conditions. The Agency will implement wind erosion control measures that will reduce long term wind erosion. Substantial erosion by water is likely to be limited due to the relatively flat slope of the land and construction of the low berm recharge areas. Therefore, over the long term, no net change to existing soil loss from the recharge areas is anticipated. To ensure this, the Agency will prepare and implement Mitigation Measure GEO-1.

2.7.2.2 Effects Related to Earthquakes

Although the site is over 4 miles from the nearest major fault zone, there is some potential for strong ground shaking in the area. The Southern California Earthquake Center (SCEC) suggests that there is a 1 to 2% chance of seismic acceleration exceeding 20% of the force of gravity in the general area of the central Antelope Valley. Such displacement could affect the permanent Project facilities. If a rupture were to occur when pipelines are conveying water, flow in the pipeline would be shut down with permanent isolation valves and released water would tend to infiltrate onto the nearby soils. Minor and short term local flooding of local access roads could occur.

The low recharge basin berms will not be substantially different in construction from berms used for flood irrigation. Water depths within these basins will be low and if a berm were to slump during an earthquake,

the result would be a release of shallow sheet flow, which would rapidly percolate into the ground. No erosive flows are anticipated.

Liquefaction effects occur when groundwater levels are less than 50 feet below ground surface. Current groundwater levels are between 280 and 300 feet below ground surface. The proposed Project provides for monitoring of groundwater levels during recharge and for recharge to be modified when levels in monitoring wells reach about 75 feet below ground level. Saturated soil conditions may occur at the recharge sites, but groundwater recharge tends to have little lateral movement. In addition, groundwater recharge will occur in cycles where some years will consist of recharge and other years will consist of extraction. Saturated soil conditions at the recharge areas will therefore also be intermittent and thus permanent substantial local increases in groundwater levels are unlikely.

The Antelope Valley area is located in an area where there has been historic subsidence. This is an irreversible effect and thus the addition of water to the aquifer will not result in soil expansion followed by subsidence when water is withdrawn. Additional subsidence may occur from continued over drafting of the basin, but the effects of the Project will be to reduce, offset, and/or remediate overdraft conditions, and the Project recharge will therefore not contribute to ongoing subsidence.

2.7.2.3 Effects due to Expansive Soils

Per the National Resource Conservation Service, the soils of the Project areas have low or low-to-moderate shrink/swell potential. The same Agency designates the site as having no limitations for site development (building of structures) for about 70% of the site on the southern end of the property and some limitations on the remaining 30% of the land on the northern end. With the exception of construction of some wells, the Agency does not anticipate constructing any permanent structures on the northern end of the property. Refer to Figure 8 in Appendix A for a depiction of the site development limitations.

2.7.2.4 Effects due to Septic Systems

The proposed Project will not be setting septic facilities on soils not suitable for such purpose. Any septic facilities needed for disposal of wastewater will be situated within areas of suitable soils for septic systems.

2.7.3 Mitigation

The Agency proposes to implement the following mitigation measures to lessen the impact significance to geology and soils.

GEO-1: SWPPP - To control water and wind erosion during construction and operation of the Project, the Agency will prepare a Stormwater Pollution Prevention Plan (SWPPP) in compliance with the requirements of the National Pollutant Discharge Elimination System (NPDES) Construction General Permit.

GEO-2: Seismic Design - Although the proposed Project has little inherent potential for causing seismic safety effects, the Agency will ensure that all facilities are designed to withstand the anticipated seismic forces, consistent with local and State building codes and relevant regulations.

GEO-3: Pipeline Shut Off Valves - The Agency will install shut off valves on major pipelines to minimize the potential for flooding during seismic events.

GEO-4: Groundwater Monitoring Plan - Although the potential for the Project to raise groundwater levels to within 30 to 50 feet of the ground surface is small, to address potential impacts to local groundwater levels, the Agency will develop a monitoring program to monitor changes in water levels in the area affected by groundwater recharge operations. If monitoring identifies groundwater level rise to

75 feet below ground surface, the Agency will modify management of recharge to prevent water levels from rising to levels where liquefaction effects could occur. The Groundwater Monitoring Plan will also include provisions for monitoring of groundwater quality and the development of a native groundwater quality baseline which would be identified prior to commencement of recharge operations.

2.7.4 CEQA Significance

Based on the analysis of the potential effects of the proposed Project, the Initial Study concludes that with Mitigation Measures in place, the impacts associated with geology and soils resources will be less than significant and that the Project:

a. Would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

i. The rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map[11] issued by the State Geologist for the area or based on other substantial evidence of a known fault.

Mitigation measures will be implemented to protect Project facilities from the effects of seismic activity.

ii. Strong seismic ground shaking.

Mitigation measures will be implemented to protect Project facilities from the effects of seismic activity.

iii. Seismic related ground failure, including liquefaction.

Mitigation measures will be implemented to prevent conditions that would result in the potential for liquefaction of soils.

iv. Landslides.

Due to the relatively flat nature of the land, there is minimal potential for landslides within the alluvial plain of the Antelope Valley.

b. Would not result in substantial soil erosion or the loss of topsoil.

The possibility of erosion and loss of top soil will be mitigated through the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP).

c. Would not 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.

The Project area is situated within land that currently supports similar water infrastructure facilities including the California Aqueduct and nearby recharge facilities. Mitigation measures will be implemented to monitor the potential for liquefaction conditions.

d. Would not be located on a site with expansive soil that would create substantial risks to life or property.

The National Resource Conservation Service identifies the majority of the site as having no limitations to site development (Building of structures).

e. Would not have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

Any small septic systems that may be constructed on site will be situated in soils capable of supporting a septic system.

2.8 Greenhouse Gas Emissions

2.8.1 Introduction

Certain gases in the earth's atmosphere, classified as greenhouse gases (GHG), play a critical role in determining the earth's surface temperature. A portion of the solar radiation that enters earth's atmosphere is absorbed by the earth's surface, and a smaller portion of this radiation is reflected back toward space. Infrared radiation (i.e., thermal heat) is absorbed by GHGs; as a result, infrared radiation released from the earth 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.

GHGs are present in the atmosphere naturally, are released by natural sources, and are formed from secondary reactions taking place in the atmosphere. Carbon dioxide (CO2), methane (CH4), nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are the principal contributors to human-induced global climate change.

Global warming potential (GWP) is a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to CO2. The GWP of a GHG is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and length of time (i.e., lifetime) that the gas remains in the atmosphere ("atmospheric lifetime"). The GWP of each gas is measured relative to CO2, the most abundant GHG. GHGs with lower emissions rates than CO2 may still contribute to climate change because they are more effective at absorbing outgoing infrared radiation than CO2 (i.e., high GWP). The concept of CO2-equivalents (CO2e) is used to account for the different GWP potentials of GHGs to absorb infrared radiation.

2.8.2 Potential Impacts

The following subsections analyze the potential impacts to climate change.

2.8.2.1 Generation of Greenhouse Gas Emissions

The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; however, no single project alone is expected to measurably contribute to a noticeable incremental change in the global average temperature, or to a global, local, or micro climate. Given the nature of environmental consequences from GHGs and global climate change, CEQA requires that lead agencies evaluate the cumulative impacts of GHGs, even relatively small additions, on a global basis.

The goal of Executive Order S-3-05, signed by former Governor Arnold Schwarzenegger on June 1, 2005, is to reduce California's GHG emissions to year 2000 levels by 2010, 1990 levels by 2020, and 80% below the 1990 levels by the year 2050. In September 2006, California passed the California Global Warming Solutions Act of 2006 that requires statewide GHG emissions be reduced to 1990 levels by 2020. In 2016, this goal was reinforced with the passage of Senate Bill (SB) 32, the California Global Warming Solutions Act, which established a statewide GHG reduction goal of 40 percent below 1990 levels by 2030. The 2030 target represents reductions needed to ensure California can achieve its longer-term 2050 target of a reduction of greenhouse gases 80 percent below 1990 levels per Executive Order B-30-15.

As listed in the AVAQMD CEQA and Federal Conformity Guidelines, the AVAQMD has established a significance threshold of 100,000 tons CO_2e per year or a daily threshold of 548,000 pounds CO_2e where AVAQMD is the lead agency. Heavy duty off road equipment, materials transport, and worker commutes during construction of the project would result in exhaust related GHG emissions. During operation, direct emissions would result from vehicle trips and area sources. Total construction and operational GHG emissions were estimated using the same methodology discussed earlier under Section 2.4 (Air Quality).

As shown in Table 2.8-1, GHG emissions associated with construction and operation of the project would be below AVAQMD daily and annual significance thresholds. Additional modeling assumptions and details are provided in the project specific Air Quality Analysis Technical Report in Appendix C.

Table 2.8-1. Project Daily and Annual GHG Emissions

Emission Source	Annual GHG Emission Estimate (tons CO_2e/yr)	Daily GHG Emissions Estimate (lbs/day)
Construction Emissions	5,308	37,601
Operational Emissions	14,766	74,535
AVAQMD Significance Threshold	100,000	548,000
Exceed AVAQMD thresholds?	No	No
Source: Estimated by AECOM in 2017.		

The total construction related and operational GHG emissions associated with the project would be less than the AVAQMD daily and annual thresholds for GHG. Thus, the project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. Therefore, impacts related to GHG would be less than significant.

2.8.2.2 Conflicts with Applicable Plans, Policies or Regulations

In December 2008, CARB adopted the Climate Change Scoping Plan (Scoping Plan), which contains the main strategies California will implement to achieve the required GHG reductions required by AB 32 (CARB 2008). CARB approved the first update to the Scoping Plan, First Update to the Climate Change Scoping Plan: Building on the Framework, in June 2014 (ARB 2014). The Scoping Plan update includes a status of the 2008 Scoping Plan measures and other federal, state, and local efforts to reduce GHG emissions in California, as well as potential actions to further reduce GHG emissions by 2020. In response to SB 32 and the companion legislation of AB 197, ARB released a proposed scoping plan on January 21, 2017 for public review. The proposed 2017 Scoping Plan has not been adopted at the time of the analysis. None of these plans or policies constitutes regulations or requirements adopted to implement a statewide, regional or local plan for reduction or mitigation of greenhouse gas emissions.

The Scoping Plan updates did not directly create any regulatory requirements related to construction activities, but do include some measures that would indirectly address GHG emissions levels associated with construction activity, including the phasing in of cleaner technology for diesel engine fleets (including construction equipment) and the development of a Low Carbon Fuel Standard.

In addition, successful implementation of the Scoping Plan measures will predominantly depend on the development of future laws and policies at the state level, rather than separate actions by individual agencies or local governments. Polices formulated under the mandate of AB 32 and SB 32 that are applicable to construction-related activity, either directly or indirectly, would be implemented during construction of the project if those policies and laws are developed before the commencement of project construction. Therefore, it is assumed that project construction would not conflict with the Scoping Plan updates.

The project would not conflict with the Scoping Plan updates, or any other plans, policies, or regulations for the purpose of reducing GHG emissions. The project would also not generate GHG emissions that would have a significant impact on the environment. Therefore, the project would not conflict with any applicable plan, policy, or regulation for the purpose of reducing GHG emissions. This impact would be less than significant.

2.8.3 Mitigation

No mitigation will be needed as the impacts to greenhouse gases associated with the project are deemed to be less than significant.

2.8.4 CEQA Significance

Based on the analysis of the potential effects of the proposed project, the Initial Study concludes that the impact to greenhouse gases will be less than significant and that the project:

a. Would not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
b. Would not conflict with an applicable plan, policy or regulation adopted for the purposed of reducing the emissions of greenhouse gases.

Refer to Section 2.8.2 for explanations which were used to make the above noted conclusions.

2.9 Hazards and Hazardous Materials

2.9.1 Introduction

2.9.1.1 General Conditions

The proposed Project area is located on or adjacent to existing active and fallowed agricultural lands within the alluvial plain of the Antelope Valley. The pesticides and herbicides used for farmed crops in the vicinity of the Project do not include any of the 8 pesticides known to contaminate groundwater (California Department of Pesticide Regulation[8]). There are no records of toxic waste sites at the proposed Project. There are no schools or private and public airports located within the Project vicinity. The Project site is located outside the Military Airspace R-2508 complex which includes operations at Edwards Air Force Base.

2.9.1.2 Hazardous Materials

During the project construction period, hazardous substances used to maintain and operate construction equipment (such as fuel, lubricants, adhesives, and solvents) would be present. The use of these materials could potentially result in impacts through accidental discharge associated with use and storage of hazardous materials. The potential release of hazardous materials associated with the proposed project is limited to construction activities. Given the size of the proposed project and the types of hazardous materials needed during construction, hazardous materials would not be present on site in any significant quantity and any spill is likely to be easily contained.

Use of any hazardous materials would be conducted in accordance with all applicable State and federal laws, which include appropriate spill response procedures (Spill Prevention Plans). In addition, potential impacts associated with construction related hazardous materials would be reduced below a level of significance through required conformance with the NPDES Construction General Permit. Therefore, impacts would be less than significant.

2.9.1.3 Mosquito Borne Disease

Mosquitoes are disease carrying vectors. All species of mosquitoes require standing water to complete their growth cycle; therefore, any standing body of water represents a potential mosquito breeding habitat. Although mosquitoes will typically stay close to suitable breeding habitat and blood meal hosts, they are known to travel up to 10 miles under breezy conditions. The breeding period for mosquitos depends on temperature but generally occurs March through October. Water quality also affects mosquito reproduction. Poor quality water with limited circulation, high temperature, and high organic content produces greater numbers of mosquitoes. In addition, irrigation and flooding practices may influence the level of mosquito production associated with a water body. Typically, water bodies with water levels that slowly increase or recede produce greater numbers of mosquitoes than water bodies with water levels that are stable or that rapidly fluctuate.

Many species of mosquitoes exist that can cause a substantial nuisance in surrounding communities, but Culex species mosquito is the primary vector species of concern. Although the West Nile Virus can be transmitted by a number of mosquito species, Culex is the most common carrier. This disease is thought to be a seasonal epidemic that flares up in the summer and fall. The encephalitis mosquito (Culex tarsalis) breeds in almost any fresh water pond.

2.9.1.4 Valley Fever

Coccidioidomycosis, commonly known as Valley Fever, is caused by the fungus Coccidioides immitis, which grows in soils in areas of low rainfall, high summer temperatures, and moderate winter temperatures. These fungal spores become airborne when the soil is disturbed by winds, construction, farming, and other activities. In susceptible people and animals, infection occurs when a spore is inhaled. Valley Fever symptoms generally occur within 3 weeks of exposure. Valley Fever is not a contagious disease. Secondary infections are rare.

It is estimated that more than 4 million people live in areas where Valley Fever fungus is prevalent in the soils. Residents of Bakersfield, California and Phoenix, Arizona, have shown positive skin test reaction rates of 30 to 40 percent, meaning that about one-third of residents tested have had Valley Fever sometime in the past. Among those who have never had Valley Fever, the chance of infection is about 3 percent per year, but the longer one resides in an endemic area, the greater the risk. In the southwestern United States, there are approximately l00,000 new infections each year. People working in construction, agriculture, and archaeology have an increased risk of exposure and disease because these jobs result in the disturbance of soils where fungal spores are found. Valley Fever infection is highest in California from June to November. Most Valley Fever cases are mild. It is estimated that 60 percent or more of infected people either have no symptoms or experience flu like symptoms and never seek medical attention.

2.9.1.5 Military Operations

The California Military Land Use Compatibility Analyst website[22] indicates that the Project site is located in an area associated with low level (200 to 1,500 feet) military flight paths. The proposed project area is not within the Military Airspace R-2508 Complex.

2.9.2 Regulatory Environment

The principal federal regulatory agency responsible for the safe use and handling of hazardous materials is the EPA. Other applicable federal regulations are contained primarily in CFR Titles 29, 40, and 49. The federal Resource Conservation and Recovery Act enables the EPA to administer a regulatory program that extends from the manufacture of hazardous materials to their disposal, thus regulating the generation, transportation, treatment, storage, and disposal of hazardous waste at all facilities and sites in the nation.

California regulations are equal to or more stringent than federal regulations. The EPA has granted the State of California primary oversight responsibility to administer and enforce hazardous waste management programs. State regulations require planning and management to ensure that hazardous wastes are handled, stored, and disposed of properly to reduce risks to human and environmental health.

State law requires that:

- Businesses using hazardous materials prepare a plan that describes their facilities, inventories, emergency response plans, and training programs.
- Generators of hazardous waste must complete a manifest that accompanies the waste from generator to transporter to the ultimate disposal location. Copies of the manifest must be filed with the California Department of Toxic Substances and Control.
- Development and implementation of Spill Prevention and Control Plans for facilities using hazardous materials.

On a local or regional scale, the Los Angeles Environmental Health Departments manage many local hazardous materials concerns. Emergency response is often delegated to local fire departments.

2.9.3 Potential Impacts

2.9.3.1 Hazardous Materials

The Agency does not anticipate the need for treatment of the recovered water and thus it will not use hazardous materials during operation of the groundwater bank.

During construction of the proposed Project facilities, hazardous materials such as fuels and lubricants will be used to operate construction equipment and vehicles. In addition, operation and maintenance of the groundwater extraction wells and pump station may include the use of oils, lubricants, and other hazardous materials. These oils and lubricants have the potential to be released into the environment, causing environmental and/or human exposure to these hazards. Though given the small quantity and the remote nature of the project area, any effects would be less than significant.

2.9.3.2 Mosquito Bourne Disease

Open water areas are potential breeding areas for mosquitoes. For the proposed Project, up to an approximate 1,200 acres would be flooded under the low earthen berm basins. Note that not all of the 1,200 acres would be flooded at the same time. Recharge operations would be cycled throughout the site. During recharge operations, the Agency would maintain a continuous flow of water through the basins and would periodically dry them out while recharge operations are cycled to other sites. This would result in maintaining good quality water with high circulation as it flows from the high to the low end of the basin and as it percolates to the ground. With such operations, mosquito life cycles may be disrupted and potential mosquito problems minimized.

2.9.3.3 Valley Fever

The potential for Valley Fever to affect local residents is a function of wind erosion and the presence of the fungal spores in the soil. The proposed project incorporates a number of wind erosion mitigation measures that will, in the aggregate, reduce wind erosion when compared to current conditions. Recharge operations themselves will reduce wind erosion when the area is wet. No impacts are anticipated.

2.9.3.4 Military Operations

The California Military Land Use Compatibility Analyst website indicates that the Project site is located in an area associated with low level (200 to 1,500 feet) military flight paths. Bird and other wildlife strikes to aircraft can cause risks to lives of the aircraft crew members, passengers, and those on the ground, and also damage the aircraft. The incidence of bird strikes is species and location specific. The Federal Aviation Administration (FAA) maintains the National Wildlife Strike Database which is a compete record of reported strikes, by species and locale from January 1, 1990 to April 26, 2017. In addition, the Air Force maintains an Avian Hazard Advisory System (AHAS) that replaced the Bird Avoidance Model (BAM). AHAS provides general guidance on the severity of potential bird strikes hazards (by location, month, and time of day) as well as real time estimates for hazards. The risk associated with bird strikes is measured in ounces per square kilometer, which accounts for the higher damage potential of larger, heavier birds:

- Low, 0 to 169 ounces/km^2
- Moderate, 170 to 7,272 ounces/km^2
- Severe, 7,273 to 409,796 ounces/km^2

A review of AHAS indicates that air strike risk is considered moderate throughout the year in the vicinity of Edwards Airforce Base and Visual Route 1257 which contains the project site. According to the Edwards Air Force Base Plan 32-7064 (EAFB Plan August 2008)[13] the most common bird species involved in strikes is the horned lark, which forages in open areas. “Horned larks are the primary problem species associated with hazards to aircraft. They are a grassland species that do well in the desert, especially in areas that contain standing water or sparsely vegetated areas,” (EAFB Plan August 2008).

In the Lancaster Palmdale Edwards Air Force Base area, there were no bird strikes recorded in the National Wildlife Strike Database for ducks, geese, swans, hawks, eagles, vultures, falcons, ravens, or gulls. There was also no bird strikes associated with shorebirds. The database does have records of strikes on pigeons, doves, swifts, larks, and sparrows. This is consistent with Edwards AFB bird/aircraft strike hazard (BASH) data suggesting most bird strikes are of small birds and occur near the runways and during low-altitude flight.

The proposed Project could attract birds by creating shallow wet surfaces. The attractiveness of the proposed Project site to birds is affected by the type of habitat created and the level of disturbance during recharge. The attractiveness of shallow basins was evaluated by the Tulare Lake Drainage District (TLDD)[12]. In the TLDD evaluation it was found that water depth is critical to the types of birds likely to use an area. Specifically, shorebirds such as avocets and stilts have been found to use the shallow-water habitat created by TLDD in managing its system of drainage ponds. TLDD’s experimental program has shown that shorebirds have a preference for shallow habitat (0 to 12 inches in depth) with gently sloping upland habitat and that birds such as ducks and geese do not use this habitat except incidentally. In addition, the experimental program showed that shallow-water areas did not attract small birds such as doves and larks. At the same time, deeper ponds were found to be used by a variety of ducks.

Given the results of the TLDD experiments, we can conclude that the proposed Project recharge areas will not likely attract larger birds such as ducks, geese, and swans but that there is some potential to attract smaller shorebirds. These small shorebirds may be attracted to shallow water typical of agricultural flood irrigation. Some of the species of shorebirds utilize mud flats, pond edges, and the edges of shallow water habitats for foraging. These species utilize aquatic macroinvertebrates and insects as forage. Use of the area by larger shorebirds (avocets and stilts) is limited by season. Avocets winter in-Mexico, along

the coast of the southeastern United States, and in Cuba and nearby islands. Black-necked stilts generally winter to the south of the Antelope Valley in the Colorado River Basin and along the Gulf of Mexico, but may occur in small numbers throughout the year. Avocets and stilts are likely to migrate through the area in late March through May.

The level of disturbance at the recharge areas will vary depending on the method used to deliver water to recharge. The type and level of disturbance associated with operation using agricultural flood irrigation practices would involve continuous daylight activities to monitor flow rates and depths (to ensure that water did not pond locally and overtop berms). Field personnel would be on site daily during recharge. This would allow for ongoing monitoring of shorebird use (if any) and allow for active disturbance of birds to discourage use.

Given the shallow water of the proposed recharge areas and assuming some efforts to discourage bird use, migrating shorebirds and a few other birds may still utilize the recharge areas as a place to obtain water and could use them as temporary resting or foraging sites. There will be no suitable nesting habitat and the area will not be protected from predators. Nesting is not likely to occur. To the extent that this may occur, this would introduce a new source of bird strike problems. With mitigation measures in place and due to the fact that flights would likely originate from Edwards Air Force Base roughly 35 miles to the east of the site, the impact from bird strikes is less than significant.

2.9.4 Mitigation

To minimize impacts associated with the use of hazardous materials and hazards on site, the Agency proposes to implement the following mitigation measures:

HAZ-1: Spill Prevention Plan - Consistent with Agency's existing practices, the Agency will require from its construction contractors the preparation and implementation of a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities and operations. The plan and methods shall be in conformance with all State and Federal regulations. The Agency shall provide for routine inspection of the construction and operations areas to verify that the measures specified in the SPCCP are properly implemented and maintained and further ensure that contractors are notified immediately if there is a noncompliance issue and will require compliance.

HAZ-2 : Bird Strike Hazard Notification - The Agency will notify the Flight Safety Office at Edwards Air Force Base and all local airports of the potential bird strike hazard as follows:

- Prior to application of water to the recharge basins, and
- If large birds or large concentrations of small birds are observed in or near the recharge area.

HAZ-3: Bird Strike Hazard Minimization Measures - The Agency will implement actions to reduce the attractiveness of the recharges basins to birds by:

- Use of recharge basins with shallow water depths which will be generally unsuitable for the larger migratory birds,
- Monitor recharge area water and if aquatic macroinvertebrates are found to be developing in large numbers and/or foraging by shorebirds is observed, temporarily dry out recharge areas, thereby reducing the insect and aquatic macroinvertebrate forage that would attract and hold shorebirds.
- Whenever water is present in the recharge basins, the project operator will monitor the basins daily for bird activity and if found discourage their use via means acceptable to the Department of Fish and Wildlife.

HAZ-4: Mosquito Borne Disease Minimization Measures – The Agency will consult with the Antelope Valley Mosquito and Vector Control District to develop and implement a mosquito management plan. The plan would consist of a Project specific mosquito abatement program that would include quantitative abatement thresholds. The Agency and/or its representative would monitor mosquito larvae production in the recharge basins, drainages, and distribution. Larvae populations would be tracked using methods and thresholds approved by the Mosquito Abatement District, and suppression measures would be employed when thresholds are exceeded. The primacy mode of suppression would be to monitor for mosquito presence and if mosquito larvae are found, to cycle recharge temporarily so that units of recharge would be dried.

2.9.5 CEQA Significance

Based on the analysis of the potential effects of the proposed Project, the Initial Study concludes that with mitigation measures in place, the impact associated with hazards and hazardous materials will be less than significant and that the Project:

a. Would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

With the exception of construction activities, the proposed Project does not involve the transport, use, and disposal of hazardous materials. Best Management Practices (BMPs) as well as mitigation measures including the preparation and implementation of a Spill Prevention plan will be implemented to lessen the impacts to less than significant.

b. Would not 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.

Potential impacts associated with construction-related hazardous materials would be reduced below a level of significance through required conformance with the NPDES Construction General Permit.

c. Would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

There are no schools within a ¼ mile of the proposed project area.

d. Is not 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.

The Project site is not on a list of hazardous materials sites.

e. Would not result in a safety hazard for people residing or working in the project area 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.

There are no public or private airports within 2 miles of the project area. Impacts to military operations will be less than significant with the proposed mitigation measures.

f. Would not result in a safety hazard for people residing or working in the project area for a project within the vicinity of a private airstrip,

There are no public or private airports within 2 miles of the project area.

g. Would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

The proposed Project is located in a remote area and is not likely to interfere with emergency response plans.

h. Would not expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

It is not anticipated that the project will expose any residents in the vicinity to potential wildfires.

2.10 Hydrology and Water Quality

2.10.1 Introduction

The proposed Project would involve the recharge of an estimated 70,000 acre feet per year of imported State Water Project (SWP) water supplies from various State Water Contractors and other partnering agencies throughout the State of California including the Agency. Water would be conveyed to the proposed Project site via the California Aqueduct through a newly constructed 150 CFS turnout and an existing 50 CFS turnout. The Capacity of the Aqueduct for the reach adjacent to the proposed Project is about 3,000 CFS. The proposed Project would recharge SWP water supplies that may be available to the Agency and its partners primarily during above normal and wet years, when SWP supplies exceed demands. Recovery of banked groundwater would be performed during dry years and or periods of disruption of SWP water supplies.

SWP supplies would be recharged, infiltrated, and to some extent, blended with local groundwater. Stored water would generally mound below the recharge area and migrate in an easterly direction. WestWater Research LLC and Montgomery and Associates performed a feasibility of the proposed Project in March 2017[24] and estimated the migration of the recharge water to roughly 8 miles east of the site with little migration to the north, south, and west. The feasibility study notes that there are many groundwater flow barriers including the boundaries between the groundwater sub basin which limit the migration of the banked water and reduce the capacity of the site for recharge operations. Infiltration rates for the site were assumed to be about 6 inches per day.

The Antelope Valley area is semiarid, averaging less than 10 inches of rain per year. To the extent known, there are no jurisdictional perennial or ephemeral streams in the area proposed for the recharge and recovery facilities, and recharge areas are generally dry. The proposed Project area includes “Zone A” and “Zone X (0.2%)” as designated by the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps. These flood zones are shown in Figure 9 in Appendix A. Zone A indicates an area inundated by the 1% annual chance flood (100-year storm) with no base flood elevation determined. Zone X indicates areas inundated by the 0.2% annual chance flood (500-year storm), or areas of 1% annual chance flood with average depths less than 1 foot.

There are three hydrologic concerns related to the proposed Project:

- The potential for recharge operations to affect groundwater quality,
- The potential for the Proposed Project to affect runoff and flooding, and
- Potential for the Proposed Project to affect adjacent wells

2.10.2 Potential Impacts

2.10.2.1 Groundwater Water Quality

The effects of the proposed Project on groundwater quality depend on:

- The quality of the State Water Project supplies delivered for recharge compared to indigenous groundwater quality,
- The net effects of recharge and recovery on groundwater quality,
- The potential for recharge to leach chemicals from the soils during percolation,
- The potential for recharge to interact with discharge from septic systems; and
- The potential for net accumulation of minerals in groundwater.

Each of these effects is discussed below.

2.10.2.1.1 SWP water and indigenous groundwater

The quality of SWP water supplies is monitored by the California Department of Water Resources (DWR) on a routine basis to determine levels of dissolved solids and concentrations of nutrients, chloride, sulfate, sodium, trace metals, and other constituents. SWP water quality data are available electronically through the DWR Internet home page (www.water.ca.gov) and reported monthly in the State Water Project Operations Data Report (www.water.ca.gov/swp/waterquality/WQ_Summaries/index.cfm). Yearly summaries of water quality are also available. SWP supplies are considered Class A supplies, suitable for drinking water and all other urban and agricultural applications. Water quality analyses at Check 41, at the Tehachapi Afterbay upstream of the proposed project, indicate that water quality in the aqueduct consistently meets primary drinking water quality standards. See Table 2.10-1.

Table 2.10-1 SWP Water Quality Data

Constituent	CONCENTRATION AT CHECK 41 OF THE CALIFORNIA AQUEDUCT (mg/l)			
	California MCL	SWP Concentration 2015		Average as Percent of MCL
		Average	Maximum	
Aluminum	0.2	Not Measured		NA
Antimony	0.006	<0.001	<0.001	<17%
Arsenic	0.01	0.003	0.009	28.3%
Asbestos	7 MFL[a]	Not Measured		NA
Beryllium	0.004	<0.001	<0.001	<25%
Cadmium	0.005	Not Measured		NA
Chloride[c]	250	77	109	31%
Chromium (Hex)	0.01	0.001	0.003	5.0%
Copper	1	0.000	0.002	0.03%
Cyanide	0.15	Not Measured		NA
Fluoride	2	Not Measured		NA
Iron[c]	0.3	0.003	0.008	0.95%
Lead	0.015	<0.001	<0.001	<1%
Manganese[c]	0.05	<0.005	<0.005	<10%
Mercury	0.002	Not Measured		NA
Nitrate+Nitrite	10	0.80	1.63	8.0%
pH[c]	6.5-8.5	8.3[b]	9.18	NA
Selenium	0.05	0.000	0.002	0.7%
Silver[c]	0.1	Not Measured		NA
Sulfate[c]	250	73	124	29%
Total Dissolved Solids[c]	500	343	419	69%

Data from State Water Project Monthly Operations Data
http://www.water.ca.gov/swp/operationscontrol/monthly.cfm
a: MFL: Million fibers per liter
b: Data from Department of Water Resources California Data Exchange Center.
https://cdec.water.ca.gov/queryTools.html
c: Secondary MCL

Only raw water SWP supplies are specified for use in recharge in the proposed project. No provision is made for introduction of treated water supplies or reclaimed water to the groundwater basins. SWP supplies vary in water quality, primarily in response to conditions in the Sacramento San Joaquin Delta, where low inflows in dry to normal years allow seawater to intrude into the Delta. In the normal to wet years, SWP supplies are of better quality because high river flows repel seawater. This is particularly the case in the winter months when there is less demand on the SWP combined with storm related high flows. The Lahontan Regional Water Quality Control Board Basin Plan water quality objectives include provisions that are intended to protect groundwater. In general, their basin plan stresses non-degradation of groundwater.

The mixing of SWP and indigenous water may affect the overall quality of water available for use. To evaluate the effects of such mixing, the Agency has analyzed the water quality of the existing groundwater and has compared it to the SWP water quality. Water Quality test results for the indigenous groundwater are summarized in Table 2.10-2 and are compared to SWP water supplies.

Table 2.10-2 SWP / Indigenous Water Quality Comparison

Constituent	CONCENTRATION AT CHECK 41 OF THE CALIFORNIA AQUEDUCT (mg/l)		INDIGENOUS CONCENTRATION (mg/l)
	SWP Concentration 2015		
	Average	Maximum	Measured (2017)
Aluminum	Not Measured		0.2
Antimony	<0.001	<0.001	ND
Arsenic	0.003	0.009	0.0068
Asbestos	Not Measured		ND
Beryllium	<0.001	<0.001	ND
Cadmium	Not Measured		ND
Chloride[c]	77	109	13
Chromium (Hex)	0.001	0.003	0.0028
Copper	0.000	0.002	0.019
Cyanide	Not Measured		ND
Fluoride	Not Measured		0.33
Iron[c]	0.003	0.008	0.25
Lead	<0.001	<0.001	ND
Manganese[c]	<0.005	<0.005	0.0056
Mercury	Not Measured		ND
Nitrate+Nitrite	0.80	1.63	4.8
pH [c]	8.3[b]	9.18	7.7
Selenium	0.000	0.002	ND
Silver [c]	Not Measured		ND
Sulfate[c]	73	124	37
Total Dissolved Solids[c]	343	419	290

The high aluminum concentration measured in the indigenous water is likely not a representative concentration and is probably a result of the sampling methods. It is likely a sign of turbidity in the water sampled. The analysis is based on a total aluminum and not dissolved aluminum sample and thus why we believe it is not a representative sample of aluminum concentration in the native groundwater. To further support the basis of the aluminum concentration, additional sampling will be conducted as part of the background native groundwater quality baseline to be part of the Groundwater Monitoring Plan in Mitigation Measure GEO-4..

For the most part water quality for both SWP and indigenous water are of good quality and meet current drinking water quality standards. On average SWP water supplies are anticipated to have better quality

with regards to aluminum, arsenic, chromium, copper, fluoride, iron, and nitrate. Indigenous water supplies are anticipated to be of better quality with regards to chloride, sulfate, Ph, and total dissolved solids (TDS).

Total Organic Content (TOC) and Dissolved Organic Carbon (DOC) levels are not specified in the Basin Plan Objectives for either the LRWQCB or the CRWQCB. SWP supplies will introduce dissolved organic carbon compounds to receiving groundwater. Bacterial interactions with carbon compounds rapidly remove as much as 50% of TOC from recharged water. In addition, organics introduced to the upper layers of the recharge area may be utilized as nutrients for existing grasses.

A simple comparison of recharged water quality and indigenous water quality therefore suggests that there is a potential for recharge to be both beneficial and detrimental, but that there is no potential for recharge to substantially change indigenous water quality in a manner that would affect its suitability for any beneficial use. Both recharged water and indigenous water are generally suitable for drinking water purposes.

Considering that the blending of the indigenous and SWP water supplies is not likely to change the water quality significantly such that it would result in concentrations above the Maximum Contaminant Levels (NCLs), operations related to groundwater recovery and delivery of the recovered water back to the California Aqueduct are not anticipated to cause any adverse impact. The Agency will work with and comply with DWR's requirements in the development and implementation of a pump in program including monitoring of water quality of water being pumped into the Aqueduct.

2.10.2.1.2 Net Effects of Recharge, Blending, and Recovery of Stored Water

The Antelope Valley is a closed basin. Surface and groundwater within the basin does not drain to the ocean. Thus all minerals imported into the basin accumulate, either in groundwater or in the soils. For example, the dry lake beds of Edwards Air Force Base represent the deposits of such minerals from thousands of years of drainage into the Lake Thompson area. Minerals in both surface water and groundwater tend to accumulate in the eastern portion of the basin, reflecting the general drainage from west to east. The accumulation of minerals may ultimately result in concentrations such that groundwater will require treatment to meet drinking water standards. In numerous evaluations of the effects of projects in the Antelope Valley, the Lahontan Regional Water Quality Control Board has noted:

"The Water Board is aware of various projects being considered in the Antelope Valley for groundwater recharge or banking that will use imported water. These projects would supplement municipal drinking water supplies benefiting both the residents of the Antelope Valley and potentially a larger number of Californians. The groundwater basin in the Antelope Valley is a closed basin. Salts are a conservative constituent. Therefore, salts that are added to the groundwater basin will likely contribute to increases in groundwater TDS concentrations. The California Water Code section 13263(b) indicates that the Water Board "need not authorize the utilization of the full waste assimilation capacities of the receiving waters" when prescribing waste discharge requirements. The Water Board believes that it is appropriate to limit the additional salt loading to this groundwater basin by controllable sources to maintain as much assimilative capacity for groundwater recharge or banking projects ~~with~~ [which] have a higher public benefit than wastewater discharges." (Los Angeles County Sanitation District No. 14, Lancaster: Board Order No. R6V-2006-0051 WDID No. 6BI90605007)

In such statements, the RWQCB clearly contemplates and allows the use of imported supplies for groundwater recharge and recognizes the potential for such supplies to use some of the "assimilative capacity" of the basin. An analysis of what happens to the minerals recharged is therefore appropriate for defining the extent to which imported supplies may use this assimilative capacity.

When recharged water reaches the indigenous groundwater, it is expected to mound and, because flow rates are quite low, there is minimal mixing. Mixing may occur at the boundary of the two water sources and when wells extract water from both the indigenous water and the recharged water. Below ground

mixing effects cannot be predicted with certainty, but the net effects of recharge can be evaluated in terms of a mass balance analysis. The analysis assumes that 10% of recharged water is lost to evaporation and other losses as the recharged water moves down to the local groundwater table. The Agency will then only recover 90% of the amount of recharged water. In this type of analysis, the net input of mineral components from recharge is estimated in terms of the amount of each mineral remaining in the ground following recovery of an amount of water equal to 90% of the gross amount delivered to recharge.

Water that is recovered for use is then assumed to be collected in a centralized location where a new booster pump station and storage tank would be built to return the banked water back to the California Aqueduct for delivery to the Agency and its partners.

Given the recharge, blending, and recovery scenario, the net effect of recharge on groundwater quality can be estimated by

- Calculating the amount of each mineral constituent in the recharged water, and
- Calculating the amount of each mineral constituent in the blend of recovered water.

Using a mass balance analyses, it is feasible to estimate the net effect of the Proposed Project on groundwater quality (Table 2.10-3). This process involves converting the concentrations of minerals on Table 2.10-2 to tons per acre-foot of water based on:

- 1 mg/liter = 3.78 mg/gallon = 28.4 mg/cubic foot = 1,237,104 mg/acre-foot
- 1,237,104 mg/acre-foot = 1,237 grams/acre-foot = 1.23 kilograms/acre-foot
- 1.23 kilograms/acre-foot = 2.7 pounds/acre foot/2000 = 0.00135 tons/acre-foot

The mass of minerals in a given volume of water is then calculated as:

- Concentration in mg/l x 0.00135 tons/acre-foot x acre-feet

For example, for SWP supplies with a concentration of 64 mg/l of chlorides, a volume of 70,000 acre feet of water recharged would contain 6,048 tons of chloride:

- 64 x 0.00135 tons/acre-foot x 70,000 acre-feet of recharge = 6,048 tons

The net effect of recharge on the mass of minerals in the groundwater is then calculated by subtracting the tons of minerals of the recovered water from the tons of minerals of the recharged water.

Table 2.10-3 Mineral Concentrations After Groundwater Recovery Operations (90-10 Blend)

Constituent	Concentration (mg/l)			Material Content (tons)		Net Change in GW Minerals (tons)
	SWP	Local GW	Blend (9:1)	SWP (280,000 AF)	Recovered (252,000 AF)	
Antimony	0.001	0.000	0.001	0	0	0
Arsenic	0.003	0.007	0.003	1	1	0
Chloride	77	13	71	29,106	24,018	5,088
Chromium (Hex)	0.001	0.003	0.001	0	0	0
Copper	0.000	0.019	0.002	0	1	-1
Fluoride	0.000	0.330	0.033	0	11	-11
Iron	0.003	0.250	0.028	1	9	-8
Lead	0.001	0.000	0.001	0	0	0
Manganese	0.005	0.006	0.005	2	2	0
Nitrate+Nitrite	0.80	4.80	1.20	304	409	-106
Sulfate	73	37	70	27,689	23,686	4,002
Total Dissolved Solids	343	290	337	129,512	114,771	14,742

Table 2.10-4 Mineral Concentrations After Groundwater Recovery Operations (80-20 Blend)

Constituent	Concentration (mg/l)			Material Content (tons)		Net Change in GW Minerals (tons)
	SWP	Local GW	Blend (8:2)	SWP (280,000 AF)	Recovered (252,000 AF)	
Antimony	0.001	0.000	0.001	0	0	0
Arsenic	0.003	0.007	0.004	1	1	0
Chloride	77	13	64.200	29,106	21,841	7,265
Chromium (Hex)	0.001	0.003	0.001	0	0	0
Copper	0.000	0.019	0.004	0	1	-1
Fluoride	0.000	0.330	0.066	0	22	-22
Iron	0.003	0.250	0.052	1	18	-17
Lead	0.001	0.000	0.001	0	0	0
Manganese	0.005	0.006	0.005	2	2	0
Nitrate+Nitrite	0.80	4.80	1.603	304	545	-242
Sulfate	73	37	66.000	27,689	22,453	5,235
Total Dissolved Solids	343	290	332.100	129,512	112,980	16,532

Table 2.10-5 Mineral Concentrations After Groundwater Recovery Operations (60-40 Blend)

Constituent	Concentration (mg/l)			Material Content (tons)		Net Change in GW Minerals (tons)
	SWP	Local GW	Blend (6:4)	SWP (280,000 AF)	Recovered (252,000 AF)	
Antimony	0.001	0.000	0.001	0	0	0
Arsenic	0.003	0.007	0.004	1	2	0
Chloride	77	13	51.400	29,106	17,486	11,620
Chromium (Hex)	0.001	0.003	0.001	0	0	0
Copper	0.000	0.019	0.008	0	3	-3
Fluoride	0.000	0.330	0.132	0	45	-45
Iron	0.003	0.250	0.102	1	35	-34
Lead	0.001	0.000	0.001	0	0	0
Manganese	0.005	0.006	0.005	2	2	0
Nitrate+Nitrite	0.80	4.80	2.402	304	817	-514
Sulfate	73	37	58.750	27,689	19,987	7,702
Total Dissolved Solids	343	290	321.575	129,512	109,400	20,112

The Analysis summarized in Tables 10.2-3 through 10.2-5 suggest that depending on the rate of blending there is a potential for the project to have a positive net effect on the mass load of:

- Copper
- Fluoride
- Iron, and
- Nitrate

However, as the percentage of indigenous groundwater extracted in the blend of well water increases, the net load of chlorides, sulfates, and Total Dissolved Solids also increases.

In summary, the Proposed Project (a) does not affect the beneficial use of the stored supplies, at any blend of SWP and indigenous groundwater and (b) has somewhat greater benefits than adverse impacts associated with mass loading of minerals as the concentration (mg/l) in the blended water is such that it does not change the intended beneficial use of the water.

2.10.2.1.3 Pesticide Contaminations

The use of herbicides and pesticides in urban and agricultural settings has potential to contaminate Groundwater. The California Department of Pesticide Regulation (CDPR) prohibits the use of seven such pesticides that have been found in groundwater in California (CDPR 2017):

- Atrazine
- Simazine
- Bromacil
- Diuron
- Prometon
- Bentazon
- Norflurazon

Only these pesticides have actually been found in groundwater in California. Most pesticides break down rapidly in soil and do not reach deep groundwater (CDPR 2017). The CDPR also establishes groundwater protection areas in any area where depth to groundwater is less than 70 feet.

The potential for these pesticides to be found in groundwater under the proposed Project site is low because (a) these contaminant pesticides are prohibited in canals, and other conditions that favor movement to groundwater, including in the vicinity of well heads, and (b) they were not found in well water from the area near the proposed project site.

The potential for pesticide contamination as a result of leaching during recharge operations is small because:

- Pesticide concentrations were not found in existing wells,
- Pesticides known to contaminate groundwater have not been used and will not be used within the recharge area, and
- Existing soils and water depth do not favor leaching,

General rules for pesticide management (CDPR 2017) stress that pesticide leaching is most of concern when soils are highly permeable, the water table is shallow, and soils have a low organic/clay composition. Existing site conditions at the proposed project site are such that the existing groundwater level (below the 250 ft) and the lack of ongoing agricultural operations do not present a high potential for groundwater contamination from pesticides.

2.10.2.1.4 Arsenic Mobilization Potential

Arsenic in the vicinity of the project was tested in the first quarter of 2017 and on average has sampled at about 7 ppb which is below the regulated MCL of 10 ppb for drinking water and within the range of SWP water supplies (3 ppb average and 9 ppb maximum).

2.10.2.1.5 Interactions with Septic Systems

Groundwater levels in the vicinity of the project area will rise as a result of the proposed recharge operations. Long term groundwater levels in in the area will likely rise significantly beyond levels anticipated if the project was not to take place. Under some circumstances, recharge may raise groundwater levels enough so that there is an interaction between rising groundwater and water from septic systems percolating into the soil. Two conditions must be met before such problems occur:

- Recharge must raise groundwater levels, and
- Septic systems must be located on soils that are highly permeable so that the leacheate escapes the surface zone.

The proposed Project area is very sparsely developed and is designated as an area of non-urban, open space. The number of existing septic systems in the vicinity of the project is low. The potential for development to occur nearby the project area is minimal because of the existing land use designations. Septic systems are not intended to allow for percolation to groundwater. The design of the leach field is intended to spread out the flow from the septic tank enough so that water does not escape the top layer of soils. Ideally, the leach field would be large enough so that the rate of flow is approximately equal to (a) the ability of soil to absorb the leacheate and (b) the ability of plants to take up the leacheate from the wetted soil. This prevents discharge to the leach field from leaching into groundwater and from welling up to the surface.

Nevertheless, recharge operations have been known to raise groundwater levels with unintended consequences related to septic systems. For example, recharge at the Yucca Valley recharge basins raised groundwater levels by 240 feet, and has been associated with high nitrate concentrations and turbidity in water extracted. Although nitrate concentrations in the recharged water were low, high nitrate

concentrations in the groundwater were an indirect effect of rising groundwater encountering high nitrate water from nearby septic systems. High turbidity was an indirect result of recharged water becoming saturated with air during recharge, resulting in high levels of dissolved gas in the water pumped from the rising aquifer. Such indirect effects may occur under a wide variety of conditions. In this case, coarse sandy soils allowed rapid percolation of leacheate into the soils.

In a USGS review of nitrate contamination of groundwater (Nolan et al 1998)[20], factors affecting contamination from fertilizers and septic systems identified included:

- Soil drainage conditions (well drained soils present the highest risk because they allow fertilizers and septic discharge to leach into groundwater),
- Population density (dense areas tend to produce more nitrate contamination), and
- Depth to groundwater (shallow water is most at risk).

Loamy soils, soils with a balance of sand, silt, and clay, allow only moderately rapid drainage into the groundwater basin and have more chemical/biological activity. In these soils, recharge rates are low to moderate; the same holds true for leaching from septic systems (Engle et al 1991, cited in Washington University Extension 1993)[23]. To prevent contamination of soils by septic systems, Engle et al (1991) recommends that "it is best to avoid wet soils and very coarse textured soils altogether." Loamy soils, however are able to slow down leaching and remove pathogens from water as it leaches through them. Work by others, such as Pang et al (2006)[21] suggest that, to avoid problems associated with clusters of septic tanks and wells downslope of septic systems, groundwater levels should be deep, to take advantage of the removal of bacteria in the unsaturated zone.

There are a number of factors that thus suggest that interactions between the recharge and septic systems will be avoided:

- The proposed Project will not be setting septic facilities on soils not suitable for such purpose. A small septic system may be required for the installation of a bathroom for the bank operator. The septic system will be designed such that the potential for groundwater contamination will be avoided given the anticipated rise in the groundwater table (leach lines will be spread out over a larger area).
- The Agency will operate the bank so that groundwater levels will not rise above 75 feet below ground surface.
- The land surrounding the proposed Project site consist of fallowed and active agricultural land and a small quantity of low density residential homes to the east and south of the project.
- Existing groundwater levels are deep and the recharged water will spread out as it moves. The potential for the mounded recharge water to rise to 100 feet below ground surface is low as the Agency will monitor and change recharge operations as necessary to maintain the groundwater level below 75 ft. (100 ft is the level considered by Nolan et al 1998[20] at which it becomes a greater risk of nitrate contamination).

Therefore, interactions of recharge and septic systems are highly unlikely and no impacts to groundwater quality are anticipated.

2.10.2.2 Safety Concerns

Safety concerns that are generally raised in association with groundwater recharge projects are:

- Potential for recharge to cause liquefaction effects, and
- Potential for the recharge basins to adversely affect flood flows and drainage.

2.10.2.2.1 Potential for Liquefaction Effects

The potential for liquefaction as a result of the project recharge operations was addressed in Section 2.7 of this study. Based on the conclusions presented, it is reasonable to conclude that liquefaction potential is a concern when the depth to groundwater is about 30 feet. At 50 feet, potential liquefaction effects are very low. The Agency will monitor groundwater levels and will modify recharge operations as groundwater levels rise above 75 feet below ground surface.

2.10.2.2.2 Drainage, Runoff, Flooding

A hydrology and Hydraulic Study, see Appendix F was prepared to evaluate the project's drainage, runoff, and flooding potential. The following is a summary of the evaluation.

The proposed Project area is located in the western end of Antelope Valley in "Zone A" and "Zone X (0.2%)" as designated by the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps . These flood zones are shown in Figure 9 in Appendix A. Zone A indicates an area inundated by the 1% annual chance flood (100-year storm) with no base flood elevation determined. Zone X indicates areas inundated by the 0.2% annual chance flood (500-year storm), or areas of 1% annual chance flood with average depths less than 1 foot.

The project site has Seven (7) major tributary streams as described below. Refer to Figure 3 of Appendix F.

a. **Antelope Canyon Creek** is an unnamed stream originating from Antelope Canyon in the Tehachapi Mountains north of the project site. The stream is tributary to approximately 4,267 acres with a total elevation difference of approximately 1,845 feet. The stream is confined within the mountains and spreads into an alluvial fan once it is within Antelope Valley.
b. **Pescado Creek** is a named blue-line stream on U.S. Geographic Survey (USGS) topographic maps originating from the Tehachapi Mountains north of the project site. The stream is tributary to approximately 7,927 acres with a total elevation difference of approximately 3,000 feet. The stream is confined within the mountains and spreads into an alluvial fan once it is within Antelope Valley.
c. **Big Sycamore Canyon Creek** is a named blue-line stream on USGS topographic maps in the Tehachapi Mountains north of the project site. The stream has a well-defined channel and is tributary to approximately 4,751 acres with a total elevation difference of approximately 1,800 feet. The stream is confined within the mountains and spreads into an alluvial fan once it is within Antelope Valley.
d. **Oso Canyon Creek** is a named blue-line stream on USGS topographic maps and originates from the San Gabriel Mountains west of the project site. The stream is tributary to approximately 21,710 acres with a total elevation difference of 2,163 feet. This watershed includes Little Sycamore Canyon Creek, which is a separate named blue-line stream that joins with Oso Canyon Creek upstream of the project site. The stream crosses the California Aqueduct twice, confining it to a relatively narrow area on the west side of the project site.
e. **Tentrock Canyon Creek** is an unnamed stream originating from Tentrock Canyon in the San Gabriel Mountains south of the project site. The stream is tributary to approximately 5,890 acres with a total elevation difference of 2,575 feet. The stream is diverted by the California Aqueduct into a flume crossing above the aqueduct. Downstream of the flume flow is unrestricted.
f. **Horse Camp Canyon Creek** is an unnamed stream originating from Horse Camp Canyon in the San Gabriel Mountains south of the project site. The stream is tributary to approximately 1,983 acres with a total elevation difference of 936 feet. The stream is diverted by the California Aqueduct into a flume crossing above the aqueduct. Downstream of the flume flow is unrestricted.
g. **Cow Springs Canyon Creek** is an unnamed stream originating from Cow Springs Canyon in the San Gabriel Mountains south of the project site. The stream is tributary to approximately 3,619 acres with a total elevation difference of 2,755 feet. The stream is diverted by the California

Aqueduct into a flume crossing above the aqueduct. Downstream of the flume flow is unrestricted.

Table 2.10-6 summarizes the anticipated 100-Yr flood depths for each of the above mentioned tributary streams and the combined outflow at the eastern boundary of the proposed project site.

Table 2.10-6. Flood Depth Estimate

Watershed	Flow (cfs)	Velocity (fps)	Width (ft)	Depth (ft)
Antelope Canyon Creek	3,331	2	1,500	1.3
Pescado Creek	4,717	2	1,500	1.9
Big Sycamore Canyon Creek	3,126	2	800	2.2
Oso Canyon Creek	10,753	3	550	6.9
Horsecamp Canyon Creek & Tentrock Canyon Creek	6,351	7	200	4.6
Cow Springs Canyon Creek	3,500	24	30	3.8
Outflow (Combined Total)	31,778	2	3,400	4.7

A typical recharge program, involving the construction of large, permanent berms to retain flow would result in a significant change in the drainage patterns in the area and in particular would preclude flood flows from passing through the recharge area, thus diverting flows to adjacent properties. However, the Agency is not proposing to isolate the site from flood flows and will utilize flood irrigation methods to install only temporary berms of not greater than about 36 inches in height.

Since recharge will generally occur in above normal to wet years, there is some potential for flood flows to occur during the recharge periods.

The slope of the land in the vicinity of project drains from southwest to east. The project will preserve existing topography and not significantly alter existing drainage patterns. The intent is for runoff to continue entering and exiting the project site at the same locations they do now. During a flood event, the berms are intended to be sacrificial. Once retained flow volume exceeds the top of the berm it will fail and runoff will continue in its historic direction. The berms will dissipate energy and should reduce erosion and siltation downstream. Drainage flows would enter the recharge area, temporarily be constrained by the low berms, and then overtop and flow from one berm to the next until breaching the last berm on the eastern end of the property. A beneficial effect of the berms is that it would temporarily detain flood flows, allow for some percolation of these flows into the ground, and then allow flow to exit the site in a manner similar to pre-project conditions. Berms will also retain and recharge low flow storm runoff.

The project will also involve construction of a 250,000 gallon storage tank and booster pump station. These facilities are proposed to be built on an estimated 2-acre site adjacent to the California Aqueduct with gravel parking pads. This site is located on the high side of the site and facilities will be designed such that flows would pass around the structures without impacting the overall drainage patterns.

2.10.2.3 Impacts to Adjacent Wells

Groundwater recharge will generally raise groundwater levels when compared to no project conditions, and will benefit adjacent private well owners by reducing the cost of pumping supplies. In addition, the Agency has incorporated best management practices into its proposed project description that ensure that net extractions of groundwater by the Agency and its partners will not exceed 90% of the volume of water recharged. There is a potential, however, that the operation of large wells to extract water during drought may result in lower water levels in nearby wells. Given the general improvement in water levels as a result of recharge, there is little potential for loss of supply, but localized declines in water levels may reduce well production somewhat and raise well pumping costs.

2.10.3 Mitigation

To mitigate potential impacts associated with hydrology and water quality from the project, the Agency proposes to implement the following mitigation measures:

HWQ-1: Drainage Design - Recharge areas will be constructed so that they will not divert sheet flooding and other runoff away from the recharge areas. This will allow flood water to flow into the recharge areas where flows will be somewhat retarded by the recharge berms. Berms will be designed with berm heights below the calculated flood depth elevations and intended to be sacrificial. Flood flows would enter the site, go through the berms, overtop or destroy the berms in sequence, and eventually exit the project site along the eastern boundary of the proposed project in a manner similar to pre-project conditions.

HWQ-2: **Stormwater Pollution Prevention Plan (SWPPP)** - To reduce or eliminate Construction related water quality effects, before onset of any construction activities, the Agency or its contractor will prepare a Storm Water Pollution Prevention Plan. The SWPPP will include temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover). These measures will be employed to control erosion from disturbed areas. Measures for the control of pollutants during construction include:

- Use of existing access points to minimize dust and tracking materials onto Public Streets,
- Designated Parking, Storage, and Service Areas protected by silt fence and oil absorbents and sloped to control drainage,
- Minimize diesel storage,
- Stockpile spill cleanup materials,
- Regular vehicle inspection for leaks.
- Fuel off-channel with a secondary containment system for spills,
- Use quick connects whenever possible,
- Fueling by authorized personnel only, and
- Spill cleanup materials readily available.

The SWPPP shall include a Fugitive Dust Control Plan (FDCP) that will include extensive measures to control and manage soil erosion. The FDCP will provide for management of open soils that will contribute to management of runoff.

Consistent with the SWPPP and the Agency's current construction management practices, the Agency or its agent will perform routine inspections of the construction area to verify that the BMPs specified in the SWPPP are properly implemented and maintained. The Agency will notify its contractors immediately if there is a noncompliance issue and will require compliance.

HWQ-3: Spill Prevention Plan - Consistent with Agency's existing practices, the Agency will require from its construction contractors the preparation and implementation of a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities and operations. The plan and methods shall be in conformance with all State and Federal regulations. The Agency shall provide for routine inspection of the construction and operations areas to verify that the measures specified in the SPCCP are properly implemented and maintained and further ensure that contractors are notified immediately if there is a noncompliance issue and will require compliance.

HWQ-4: Protection of Off Site Wells. To address potential impacts to groundwater and adjacent well owners, the Agency will develop a monitoring program to monitor changes in water levels and well production in the area affected by groundwater recharge operations. The program will specify that:

- Extractions of groundwater shall not exceed 90% of the amount of water recharged,
- Water quality in recovered water and in groundwater flowing away from the Project will be monitored to ensure that water quality remains appropriate for designated beneficial uses,

- During recharge operations, water levels will be monitored and recharge operations will be suspended in the event that offsite water levels rise to within 75 feet of the ground surface, and
- During recovery operations, water levels in offsite wells will be monitored and operations will be adjusted if offsite wells are found to be adversely affected by project operations,

HWQ-5: Management of Herbicides and Pesticides - The Agency will comply with all regulations of the California Department of Pesticide Regulation regarding the use of herbicides and pesticides in areas designated for groundwater recharge.

2.10.4 CEQA Significance

Based on the analysis of the potential effects of the proposed Project, the Initial Study concludes that with mitigation measures in place, the impacts associated with hydrology and water quality will be less than significant and that the project:

a. Would not violate any water quality standards or waste discharge requirements.

The water quality analysis indicates that SWP supplies will not substantially degrade indigenous water quality to the extent that a net degradation will occur or that any beneficial use of water would be affected.

b. Would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level.

The Proposed Project would increase groundwater supplies and local groundwater levels. Implementation of monitoring and best management practices will ensure that local wells owners are not adversely affected.

c. Would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on or off site.

d. Would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site.

c & d -The atypical design of the recharge areas will preclude substantial alteration of drainage patterns. Mitigation measures will further ensure that the impacts associated with drainage be less than significant.

e. Would not 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.

Provisions of the SWPPP and Spill Prevention Plan (mitigation measure) will reduce the potential for construction related pollutant discharge. There are no stormwater facilities in the area nor are they planned to occur in the future.

f. Would not otherwise substantially degrade water quality.

The Agency will comply with all regulations of the California Department of Pesticide Regulation regarding the use of herbicides and pesticides in areas designated for groundwater recharge. Ongoing project operations will be conducted under California Department of Pesticide Regulation, which precludes use of pesticides known to contaminate water. Groundwater levels

are deep. Septic systems will be constructed with extended leach lines. Potential for conflict between recharge and septic tank discharge is low.

g. Would not Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.

The project does not include the construction of new housing.

h. Would not place within a 100-year flood hazard area structures which would impede or redirect flood flows.

Placement of temporary low earthen berms for recharge operations are not anticipated to substantially alter the natural path and intensity of flood flows. These berms will be constructed no higher than the anticipated flood depths and are intended to be sacrificial. During a flood event, flood water will either overtop and or destroy the berm in a sequential order from west to east and is anticipated to leave the site in a similar nature as existing. Construction of the pump station and tank will be sited on the upstream end of the site adjacent to the California Aqueduct and given the small foot print of these structures is not anticipated to be a substantial factor in re directing flood flows.

i. Would not expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.

The project does not involve the construction of structures that would increase the potential for flooding as a result of the failure of a levee or dam.

j. Would not have inundation by seiche, tsunami, or mudflow.

The project will not cause seiche, tsunami, or mudflow effects.

2.11 Land Use and Planning

2.11.1 Introduction

The proposed Project site is located in unincorporated areas of northern Los Angeles County in Sections 1, 2, 11, and 12 of Township 8 North, Range 17 West, northwest of the community of Neenach. Refer to Figure 1 in Appendix A to reference the project location. Land use and planning of the Project site is governed by the policies, procedures, and standards set forth in the Los Angeles County[18] and the Antelope Valley Areawide[19] General Plans. Land use designations for the project site are specified as OS-C (Open Space Conservation) and RL-10 (Rural Land with 1 dwelling unit allowed per 10 gross acres of land). The land within the project is zoned as OS (Open Space) and A-2-2 (Heavy Agricultural). See Figure 10 in Appendix A. The proposed project will not change nor conflict with the land use and zoning designations of the Project site.

The State of California recognizes the military's needs for low level flight paths special use airspace to train personnel and test weapon systems effectively. The State also recognizes that the development of certain land uses may impair the military's ability to train personnel and test weapon systems. As such, Senate Bill 1462 requires state agencies to consider the effects of civilian land uses that may be incompatible with the military's use of its assets. The Bill authorizes any branch of the U.S. Armed Forces to consult with a public agency and a project applicant to discuss the potential alternatives, mitigation measures, and the effects of the Project on its military installations.

The California Military Land Use Compatibility Analyst (CMLUCA)[22] was developed by the Governor's Office and Planning and Research to help Project sponsors determine whether a proposed project has the potential to affect military readiness and requires local planning agencies to notify the military

whenever a proposed development is located within 1,000 feet of a military installation, within special use airspace, or beneath a low-level flight plan. The Joint Service Restricted Air Space was created by the Department of Defense and the Federal Aviation Administration (FAA) in recognition that aircraft associated with these military installations extend well beyond their boundaries. The proposed Project is located outside any military training areas including the nearby R-2508 Complex but, CMLUCA identifies the project site location to be in a military operations low level flight path.

The proposed Project facilities are not inconsistent with the non-urban open space designations that apply to the area. Military operations near the site will not be significantly impacted by the proposed project. Bird aircraft strike hazards are addressed under the Hazards and Hazardous Materials section of this Study. Therefore the Proposed Project's potential to conflict with existing land uses is limited to:

- Potential to constrain future development,
- Potential to be incompatible with existing development, and
- Potential to affect low-level flight operations

2.11.2 Potential Impacts

2.11.2.1 Constraints to future Development

Given the proposed Project area land designation of open space and rural land, and the existing use as fallowed agricultural land, the provision for ongoing groundwater recharge and recovery operations do not pose a substantial constraint on future planned development for this area.

2.11.2.2 Compatibility with Existing Development

There is no evidence that the Project facilities are inherently incompatible with the existing use of the land. The Project's surrounding areas include facilities similar to those proposed for this project. These include an existing groundwater bank to the north of the proposed Project site and water infrastructure facilities associated with the California Aqueduct to the east and south of the site.

2.11.2.3 Compatibility with Military Operations

The tallest structure to be constructed for the proposed Project is a 24 to 32 foot high storage tank. This is approximately the same height as a typical power pole and large agricultural storage areas in the vicinity. The proposed Project would thus not place tall structures in the flight path of low level military operations.

2.11.3 Mitigation

No mitigation will be needed as the impacts to land use and planning associated with the Project are deemed to be less than significant.

2.11.4 CEQA Significance

Based on the analysis of the potential effects of the proposed Project facilities, the Initial Study concludes that the impacts associated with land use and planning will be less than significant and that the project:

a. Would not physically divide an established community.

The proposed Project is located in a rural area, surrounded by undeveloped land, and would not physically divide an established community. The Proposed Project construction and operation would not restrict movement through or around the area.

b. Would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.

The proposed project does not change any Land Use designations and or Zoning of the land. The proposed Project also will not prohibit low level flight military operations near the proposed project area.

c. Would not conflict with any applicable habitat conservation plan or natural community conservation plan.

There are no habitat or natural community conservation plans within the project site.

2.12 Mineral Resources

2.12.1 Introduction

Mineral resources (i.e., minerals and aggregate deposits, such as sand, gravel, and other construction aggregate) are largely produced in the washes along the southerly foothills of Los Angeles County. Each area within the County is classified into Mineral Resource Zones (MRZs) by the State of California Department of Conservation. The Antelope Valley Areawide Plan[19] does not identify the proposed Project area as being within land designated for mineral resource extraction. Refer to Figure 11 in Appendix A.

2.12.2 Potential Impacts

There are no anticipated potential impacts no mineral resources associated with the implementation of the proposed Project.

2.12.3 Mitigation

No mitigation will be needed as there are no anticipated potential impacts to mineral resources associated with the Project.

2.12.4 CEQA Significance

Based on the analysis of the potential effects of the proposed Project, the Initial Study concludes that there are no anticipated potential impacts to mineral resources as a result of the proposed Project and that the project:

a. Would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.

b. Would not result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

a & b -The Antelope Valley Areawide Plan[19] does not identify the land within the proposed project area as designated for mineral resource extraction.

2.13 Noise

2.13.1 Introduction

Noise is an environmental variable that may affect people. Environmental noise for mobile sources such as construction equipment is regulated by State and Federal agencies. These agencies establish noise standards and technology for such equipment. Noise from stationary sources is generally regulated by local agencies such as County planning commissions. There are various methods for describing noise:

- A weighted decibels (dBA) : A direct measure of sound energy intensity, adjusted for the variation in frequency response of the human ear,
- Energy equivalent noise level (Lmin) : The average noise level over a given period;
- Day-Night noise level (L_{dn}) : A weighted noise level for a 24-hour period, and
- Community noise equivalent level (CNEL) : Equal to Ldn except that a 5 dBA adjustment is added to the night noise level.

Noise energy levels (dBA) decrease with distance from the source. For line sources such as traffic, noise levels decrease by 3.0 to 4.5 dBA for every doubling of the reference distance from the source. For stationary sources, noise reduction is 6.0 to 7.5 dBA for every doubling of the reference distance from the source. For example, if traffic noise is measured at 65 dBA at 50 feet, it will be reduced to 62.0 to 60.5 dBA at 100 feet. Noise levels are also affected by topography, structures, wind direction, and humidity.

There have been a number of studies of construction noise levels. The majority of these studies have been based on tests in the 1970's and 1980's. Since then, there have been improvements in construction equipment noise management that have reduced the noise levels generated by construction equipment. Data from EPA from 1971 notes that typical construction activities generate noise levels of 78 to 89 Lmin at 50 feet. A conservative estimate of potential for construction to exceed noise standards can be made using these worst case 1971 estimates.

Construction equipment will thus generate noise levels from 78 dBA to 89 dBA at 50 feet from the construction site, with lower noise levels at greater distances. Typical agricultural equipment, such as a typical tractor, would generate about 85 to 88 dBA at 50 feet. Tractors fitted with mufflers may generate noise levels in the 69 to 75 dBA range at 50 feet. Noise levels from construction vary somewhat from the above estimates based on the number of pieces of equipment used at a single site. Where multiple pieces of heavy equipment may be used, the upper level of noise generated is raised to about 90 dBA.

Potential sources of noise associated with the Project include:

- Construction activities related to
    - Monitoring wells,
    - Extraction wells,
    - Recharge basins,
    - Pipelines,
    - Turnouts, and
    - Pump station and storage.
- Operation of the extraction wells and pump station.

With the exception of well drilling operations which may be continuous (24 hrs per day / 7 days per week), construction activities will be limited to day light hours. Project construction activities are located in a rural setting with minimal noise receptors.

2.13.2 Regulation of Noise Impacts

Los Angeles County has adopted standards for specific types of development (Los Angeles County Code[17] 12.08) and has designated the thresholds for acceptable permanent ambient noise levels in single family residential areas at 45 dBA during night time and 50 dBA during day time hours. Construction activity thresholds for single family residential areas are designated at 75 dBA during day time hours and 60 dba during night time hours. Thresholds for long-term stationary construction equipment such as a well drilling rig operating longer than 10 days are designated for single family residential areas as 60 dBA during day time and 50 dBA during night time hours.

Per the Noise Element of the County General Plan, noise levels up to 60 CNEL are considered “normally acceptable” for low-density residential development.

2.13.3 Project Designated Noise and Vibration Thresholds

2.13.3.1 Construction Noise Significance Threshold

The Los Angeles County Code limits short term, mobile operating equipment to 75 dBA at single-family residential structures between the hours of 7:00 a.m. and 8:00 p.m. on all days except Sunday and legal holidays. With the exception of well drilling operations, it is assumed that construction of the proposed project would be limited to these timeframes. Between 8:00 p.m. and 7:00 a.m., on Sundays, and on legal holidays, the maximum noise level allowed at single-family residential structures is limited to 60 dBA.

2.13.3.2 Construction Vibration Significance Threshold

Per the Los Angeles County Code of, construction vibration would be considered a significant impact if a motion velocity of 0.01 inches per second over the range of 1 to 100 Hz occurs at any individual at or beyond the property boundary of the source if on private property, or at 150 feet from the source if on a public space or public right-of-way.

2.13.3.3 Operation Noise Significance Threshold

Operational noise impacts would be considered significant if noise levels exceed those established in the Los Angeles County Code. The most restrictive noise level that would be associated with this project is the nighttime residential property line threshold of significance of 45 dBA. For transportation related noise, a significant impact would occur if the proposed project results in a 3 CNEL or greater increase in traffic noise on a roadway segment and the resultant noise levels exceeds 60 CNEL for residential uses.

2.13.3.4 Operation Vibration Significance Threshold

Per the Los Angeles County Code of Ordinances, operational vibration would be considered a significant impact if a motion velocity of 0.01 inches per second over the range of 1 to 100 Hz occurs at any individual at or beyond the property boundary of the source if on private property, or at 150 feet from the source if on a public space or public right-of-way. No operational vibration levels exceeding this threshold are anticipated.

2.13.4 Potential Impacts

2.13.4.1 Potential Noise Receptors

There are no concentrations of dense urban development within or near the Proposed Project area. The Project area is surrounded by undeveloped land. There are about 7 isolated residential homes near the

eastern boundary of the project. There are two rural residential developments near the project area. One is located about 1/2-mile south of the California Aqueduct and the second one consisting of the community of Neenach is located about 2 miles east of the project's eastern boundary. There are no existing sources of excessive noise in the area. Highway traffic is sparse, and many of the local roads are unpaved. Traffic noise is not a current problem. With the exception of seasonal exposure to noise of agricultural operations, ambient noise levels in the area are typical of rural areas.

2.13.4.2 Construction Activities

Well Construction

Well construction involving the use of heavy equipment including a large drill rig may create noise levels in the range of 95 dBA at a distance of about 50 feet. This would be a relatively continuous noise for about one month for each of the proposed production wells and about 2 weeks for each of the proposed monitoring wells. It is likely that the residents along the eastern boundary of the project area would experience noise levels in excess of the residential noise threshold as designated by Los Angeles County. It should be noted that the County residential noise threshold is intended for urban residential developments. Well construction activities for this project will affect less than 5 residences abutting the eastern boundary of the project area.

Pipeline Construction

Pipeline construction is proposed to take place in linear segments perpendicular to the potentially affected residences abutting the eastern boundary of the proposed Project area. Construction of these pipelines is anticipated to proceed at a rate of about 400 feet per day. Given the setbacks from the road (100 ft) and anticipated rate of construction, pipeline construction noise levels would not be in excess of 75 dBA during day time hours for more than a day at a time with an anticipated 7 days (7 pipeline segments) total of noise level conditions in excess of 75 dBA in the vicinity of 280th St. West (Eastern Project boundary).

Turnout, Pump Station, Storage, Maintenance Facility Construction

Activities associated with the construction of the turnout, pump station, and storage tank are located about 1.75 miles from the rural residential development south of the California Aqueduct and 2 miles west of the residences abutting the eastern boundary of the proposed Project area. Work associated with the rehabilitation of the existing turnout is also located about ½-mile from the nearest noise receptor. Noise levels associated with this phase of construction are anticipated to be below the Los Angeles County threshold of 75 dBA during day time hours.

Recharge Basin Construction

Berm construction and maintenance would involve the use of a typical agricultural tractor and or a small scraper and water truck. Noise associated with berm construction would not differ from the noise associated with agricultural operations. There are less than 5 homes abutting 280th St. West which corresponds to the eastern boundary of the proposed Project area. Construction and maintenance of the berms may occur adjacent (about 100 ft from) to these homes. Construction near these homes would be brief and would be experienced by residents as the equipment moves across fields to construct the low berms. The resulting noise levels would be from 66 dBA to 77 dBA. Given the short duration of activities in the immediate vicinity near these homes and the fact that recharge construction and maintenance are planned for day time hours, the impact related to noise for these homes has been determined to be less than significant.

2.13.4.3 Operations

The proposed Project would house all permanent pump station and turnout facilities within enclosures such as CMU block walls. No long term increase in ambient noise levels is therefore anticipated from the

operation of these facilities. Operation of the wells would result in a noise levels from the motor at approximately 75 dBA per well at the well site location. There are 7 wells planned for construction along the eastern project boundary line where there are less than 7 existing residences that have the potential to experience noise levels higher than existing during operation of the wells.

2.13.5 Mitigation

The Agency proposes the following mitigation measures to lessen the impacts related to noise to less than significant.

NOISE-1: Construction Noise Monitoring and Minimization Measures – The Agency and its construction contractors will monitor noise levels for construction activities near and along 280th Street West corresponding to the eastern boundary of the proposed Project area which includes potential noise receptors (residential homes). In the event that noise levels exceed the County of Los Angeles designated thresholds, the construction contractor will implement noise reduction measures to include:

- Providing construction equipment with sound control devices.
- With the exception of well drilling operations, restrict construction activities to day time hours.
- In the event that construction activities occur close to sensitive noise receptors, implementing appropriate additional noise mitigation measures, including but not limited to:
    - Changing the location of stationary construction equipment,
    - Shutting off idling equipment,
    - Rescheduling construction activity
    - Notifying adjacent residents in advance of construction work, and
    - Installing acoustic barriers around stationary construction noise sources.

NOISE-2: Operation Noise Minimization Measures – The Agency proposes to construct approximately 7 groundwater wells in the vicinity of 280th St. West which have the potential to increase the ambient noise level for the nearby residential homes on the east side of 280th St. West during groundwater recovery operations. The Agency proposes to equip these wells with insulated well enclosures that will reduce the operational noise level in the area to less than significant.

2.13.6 CEQA Significance

Based on the analysis of the potential effects of the proposed Project, the Initial Study concludes that with mitigation measures in place, there are no anticipated potential significant impacts to nearby receptors as a result of the proposed Project and that the project:

a. Would not result in the exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

Mitigation measures will lessen the noise impacts to nearby residential homes abutting 280th St. West to a level which is less than significant.

b. Would not result in the exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

Some vibration may be generated by construction activities. However, this vibration will be temporary and have a less than significant impact to the residents who live along 280th St. West. Most of the homes would have a 100 foot or greater setback from the construction operations. This setback decreases the vibration from the construction locations because vibration attenuates quickly in soil. Therefore, the effect from construction related vibrations will be a less than significant impact.

c. Would not include a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project

Mitigation measures will reduce the permanent noise impacts to nearby residential homes abutting 280th St. West to a level which is less than significant.

d. Would not include a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Noise levels will be monitored and if necessary noise reduction measures will be implemented to bring noise levels to acceptable standards.

e. Would not expose people residing or working in the project area to excessive noise levels on 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.

f. Would not expose people residing or working in the project area to excessive noise levels on a project located within the vicinity of a private airstrip.

e & f - There are no public or private airports within 2 miles of the project area.

2.14 Population and Housing

2.14.1 Introduction

The project area is located in a rural area of northern Los Angeles County. The closest towns and communities to the proposed Project site are as follows:

- Golden Desert Real Estate – A small rural residential community of about 320 acres located about ½-mile south of the proposed Project site.
- Neenach – A small rural residential community of about 1,280 acres located about 2 miles southeast of the proposed Project site.
- Gorman – A small commuter driven community located about 16 miles west of the proposed Project site.
- Rosamond – An unincorporated community in Kern County with a population of about 18,000 located about 32 miles east of the proposed Project site.
- Lancaster - An incorporated City in Los Angeles County with a population of about 161,000 located about 32 miles southeast of the proposed Project site.
- Palmdale – An incorporated City in Los Angeles County with a pollution of about 158,000 located about 38 miles southeast of the proposed Project site.

The proposed project would store SWP surface water during wet years when supplies exceed demands and recover the water during dry years when demands exceed supplies. It is not anticipated that the Project will induce population growth in the above mentioned communities or the region. The intent of the proposed project is to create a more reliable source of water for the Agency and its partners and is not intended as a new source of water that would be used to induce population growth.

The Proposed Project will reduce the effects of water supply fluctuations including:

- Reduction in the frequency and severity of rationing,
- Reduction in the loss of landscape planting and agricultural production, and
- Reduction in the potential for groundwater overdraft and subsequent land subsidence.

The purpose of projects like the Proposed Project is that stored supplies intended for use during severe drought and/or emergency conditions are not used to increase normal-year supply and would be conserved during periods of low supply.

The Agency notes that there are significant and unavoidable impacts associated with growth, and that growth is planned and mitigated through the following agencies: Southern California Association of Governments, Caltrans, US EPA, US Army Corps of Engineers, County of Kern, County of Los Angeles, Local cities, the Local Agency Formation Commission, the Lahontan Regional Water Quality Control Board, the State Department of Health, California Air Resources Control Board, and the Antelope Valley Air Quality Management District. The Proposed Project is part of the Agency's mandate to mitigate for past, present, and future growth and its effects on groundwater resources by providing water and by operating to optimize the quality of water that is imported. The Proposed Project enhances pre-delivery of SWP supplies to groundwater storage and thus helps to remediate long term overdraft and prevent overdraft during drought conditions in the future. It also enhances the Agency's ability to import SWP supplies in times when they are of highest quantity. Both of these effects are considered to contribute to mitigation of any potential adverse effects of growth planned and approved by other entities.

2.14.2 Potential Impacts

Section 15126.2(d) of the State CEQA Guidelines[9] provides the following direction regarding analysis of growth inducing impacts:

Discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth. Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. Also discuss the characteristic of some projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

An evaluation of the proposed Project facilities and operation show that it will not foster permanent economic, population, or housing growth. The intent of the project is to create a more reliable source of water for the Agency and its partners. Implementation of the groundwater bank would allow the Agency and its partners to offset the shortage of water supplies during dry years when SWP water allocations are expected to be in the 5% range or in the event of disruption of the water supplies due to a natural disaster in the Delta. The implementation of this project will lessen the hardship to the Agency and its banking participants customers during the water shortage periods. The implementation of the project is not intended to serve as a new source of water supply that would have the potential to induce economic, population, and housing growth.

The proposed Project does not locate substantial facilities in developing areas, nor does it preclude housing on adjacent properties. The proposed project does have the potential to affect housing through the demolition of one residential home located within the boundaries of the proposed Project site.

The mechanisms by which the Proposed Project could affect housing are:

- Demolition of housing
- Creation of jobs and thus of demand for housing
- Environmental Justice

2.14.2.1 Demolition of Housing

The proposed Project operations have the potential to displace one single family dwelling located within the project boundary. The Agency is currently in the process of negotiating the purchase of the property

which contains this active residential dwelling. Though the impact to this individual family is significant, overall the impact has been determined to be less than significant due to the small number of housing that will be displaced. The family residing in the affected dwelling has the option of purchasing land adjacent to the project area and rebuilding their home or relocate to an existing home in one of the nearby communities referenced above.

2.14.2.2 Temporary Housing Demand

Approximately 80 workers would be employed in all aspects of construction over a period of several years. The proposed Project construction is not anticipated to generate a need for new housing because:

- Workers are not anticipated to move permanently to the area but instead commute on a weekly basis from their hometowns to the project site,
- During working days, workers would stay at nearby hotels and motels in the communities of Gorman, Rosamond, Lancaster, and Palmdale, and
- Construction jobs would generally be temporary in nature with various construction disciplines moving in and out of the Project site.

Long term operations would be expected to involve several new Agency employees, but it is likely that these employees will come from the area and will not have the need for new housing.

The increase in demand for housing attributable to the Project construction, if any, would be insignificant.

2.14.2.3 Environmental Justice

The Project is located in the rural open space on the west side of the valley. This area is dominated by agriculture and small clusters of low-density housing, which are distributed in a random patchy manner along the often discontinuous road systems. Within this area, there are no clear demographic distinctions among the small communities and the project. The project does not, therefore, differentially affect a defined socio-economic or demographic group.

In addition, there may be minor improvements in employment opportunities. None of this would have a substantial effect, either positive or negative, on local demographics or socio-economic conditions.

Finally, the project's impacts to the physical environment of the community will be minor. There would be some reduction in windblown dust as a result of recharge operations. Adverse changes to the physical environment would be minor and mitigation will reduce them to a level less than significant. In short, the project will not result in an unequal distribution of adverse impacts.

2.14.3 Mitigation

No mitigation will be needed as there are no anticipated potential impacts to population and housing associated with the Project.

2.14.4 CEQA Significance

Based on the analysis of the potential effects of the proposed Project, the Initial Study concludes that there are no anticipated potential significant impacts to population and housing as a result of the proposed Project and that the project:

a. Would not induce substantial 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 intent of the proposed Project is to improve the reliability of the water supply and not to create a new source of water that would have the potential to induce growth. Additionally, the proposed project does not include an extension of roads or expansion of public services that would have the potential to induce growth.

b. Would not displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere.

There is the potential for the displacement of a single family dwelling unit within the proposed Project boundaries. The overall impact associated with this potential displacement has been determined to be less than significant due to the quantity of affected housing (single structure).

c. Would not displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

There is the potential for the displacement of a family associated with the potential demolition of an existing house within the project site. The overall impact associated with this potential displacement has been determined to be less than significant due to the number of people that would be potentially displaced (single family). The family has the option of purchasing adjacent land and rebuilding and or relocating to an existing home in a nearby established community.

d. Would not result in a substantial unbalanced or disproportional distribution of impacts of any type on a disadvantaged demographic, such as concentration of toxic emissions in an area of low income families versus high income families.

The project does not result in distribution of impacts to a disadvantaged demographic.

2.15 Public Services

2.15.1 Introduction

The Proposed Project is located in a rural area in northern Los Angeles County. Essential public services are provided by the County of Los Angeles (sheriff and fire). The Proposed Project will not increase demand on local schools, parks, or other public services.

2.15.2 Potential Impacts

The proposed Project will not change the need for public services because it will not increase population in the area or create hazards requiring an ongoing public service response. There is a potential for construction related accidents to require public emergency service personnel but these are not likely to be frequent and hospital service levels would not be affected. Emergency response time to the project area will not be affected during construction. No changes in levels of school or park use are anticipated.

2.15.3 Mitigation

No mitigation will be needed as there are no anticipated potential impacts to public services associated with the Project.

2.15.4 CEQA Significance

Based on the analysis of the potential effects of the proposed Project, the Initial Study concludes that there are no anticipated potential significant impacts to public services as a result of the proposed Project and that the project:

a. Would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:
   i. Fire protection.
   ii. Police protection.
   iii. Schools.
   iv. Parks.
   v. Other public facilities.

   No significant impacts are anticipated because the project has no mechanism by which demand for public services would be altered substantially. The Proposed Project would place no demand on schools and parks because it would not involve the construction of facilities that require such services (i.e., residences) and would not involve the introduction of a significant temporary or permanent population into this area. During construction there is a low likelihood of the need for fire, police, and ambulance services in the area to attend potential construction related accidents. Due to the low likelihood of these accidents to take place, the impact to these services are less than significant.

2.16 Recreation

2.16.1 Introduction

The Proposed Project is located in a rural area in northern Los Angeles County. There are no known recreational facilities within or near the proposed Project area.

2.16.2 Potential Impacts

The proposed Project does not directly affect existing recreational resources. It would not result in increased use of, loss of access to, or minimized quality of parks within nearby existing communities. Because the project does not affect local population or existing land uses, the project would not result in increased demand for recreation.

2.16.3 Mitigation

No mitigation will be needed as there are no anticipated potential impacts to recreational resources associated with the Project.

2.16.4 CEQA Significance

Based on the analysis of the potential effects of the proposed Project, the Initial Study concludes that there are no anticipated potential significant impacts to recreation as a result of the proposed Project and that the project:

a. Will not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.
b. Does not include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.
c. Will not substantially reduce recreational opportunities or substantially degrade recreational experiences.

a – c, The proposed project does not include an increase in population that would increase the use of or require the new construction of local recreational areas.

2.17 Transportation / Traffic

2.17.1 Introduction

The Proposed Project is bounded by:

- Avenue A (Kern / Los Angeles County Line) on the north,
- 300th Street West on the west,
- 280th Street West on the East, and
- The California Aqueduct on the south.

Access to the site is through 300th Street West (paved road) or 280th Street West (unpaved road) from State Highway 138. All access roads within the proposed project site are unpaved.

Traffic conditions are expressed in terms of Level of Service (LOS), ranked A through F, reflecting the level of congestion and delay on the road. For 2 lane arterial roads these categories can be defined quantitatively based on an assumed traffic capacity of 15,000 vehicles per day (VPD). The normal two way segment capacity is 76,800 VPD per the Highway Capacity Manual Chapter 6[6].

Caltrans compiles data on traffic along CA State Highways and publishes the data yearly on its website[10]. The intersections in the table below are approximately 4 miles east and west from the project site.

Table 2.17-1 Nearby Roads Level of Service

Roadway	Intersection	Annual Average Daily Traffic in VPD (2015)	Percent of Capacity	Level of Service
State Highway 138	Old Ridge Route Rd	3600	24%	A
State Highway 138	245th Street West	3250	22%	A

An LOS ranking of an A is characterized by free flow and insignificant delays. LOS A can be estimated as 0 to 60% of capacity, or 0 to 9,000 VPD.

2.17.2 Potential Impacts

The project would result in a short term increase in traffic during construction along State Highway 138. Project related construction traffic would include deliveries of equipment and materials and construction personnel traveling to and from the work site. Vehicle trips associated with the delivery of construction material and equipment would be negligible as such trips would be spread-out throughout the project duration anticipated at 2 years. It is anticipated that at the most there would be about 10 equipment and or material deliveries per day and would not be considered substantial in relation to the existing traffic load in the project vicinity.

Construction equipment and materials delivery trips are estimated as follows:

- Pipelines - 180 deliveries
- Extraction wells - 192 deliveries
- Monitoring Wells - 10 deliveries

- Turnouts -12 Deliveries
- Pump station – 22 deliveries
- Storage tank – 14 deliveries.

At the peak of construction there would be at least four construction phases going on at the same time including construction of the recharge basins, wells, underground pipelines, and pump station and storage tank. The estimated crews for these phases of work are identified below:

- Recharge basins – Crew of 4
- Wells – Crew of 10
- Underground Pipelines – Crew of 8
- Pump Station and Storage Tank – Crew of 12 at peak of construction

During this peak period it is estimated that up to 34 personal vehicles would access the project site during both the morning peak period (7:00 a.m. to 9:00 a.m.) and the afternoon/evening peak period (4:00 p.m. to 6:00 p.m.), with negligible vehicle traffic during the rest of the day.

Accordingly, impacts associated with increases in construction traffic would be less than significant. It is anticipated that the LOS of State Highway 138 will not drop below the A ranking.

An insignificant long term increase in traffic generation would occur as a result of project operations. The project would require a staff of 2 to 4 people to operate the bank. During periodic maintenance the bank would require up to 5 staff. Under this assumption, at the most there would be 5 additional round Vehicle trips generated associated with operators and maintenance staff traveling from their residences to the project site.

There are no traffic related impacts for ongoing construction operations as these operations will all be contained within the project site with no actively traveled roads.

<u>As is standard practice, in the event that the Agency's construction contractors have the need to transport heavy or oversized equipment and or materials, the Agency will require that these contractors obtain special transportation permits from the State of California Department of Transportation (Caltrans).</u>

2.17.3 Mitigation

No mitigation will be needed as there are no anticipated potential impacts related to traffic associated with the Project.

2.17.4 CEQA Significance

Based on the analysis of the potential effects of the proposed Project, the Initial Study concludes that there are no anticipated potential significant impacts related to transportation and traffic as a result of the proposed Project and that the project:

a. Would not conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.

The project would not conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, including alternative modes of transportation.

b. Would not conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the District congestion management agency for designated roads or highways.

The project area does not include a state highway or principal arterial within the 2010 Congestion Management Program (CMP) for Los Angeles County [16] and the project would be consistent with the Transportation Demand Management (TDM) Element and TDM Ordinance Requirements of the CMP (Los Angeles County Metropolitan Transportation Authority 2010). Additional short and long term traffic being generated as a result of the project is less than significant and is not anticipated to change the LOS of State Highway 138.

c. Would not result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks.

The project would not include any aviation components or structures where height would be an aviation concern and therefore would not affect air traffic patterns. Mitigation Measures to address potential bird strikes to aircraft are discussed in the Hazards and Hazardous Materials section of this Initial Study.

d. Would not substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). The proposed project would not include any site modifications that would result in hazards due to design features such as driveways, intersection improvements, etc., nor would it cause incompatible uses (such as tractors) on local roads.

The Project does not propose any changes to existing roads that would constitute a traffic hazard.

e. Will not result in inadequate emergency access.

Operations of the project will not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan since the project does not include the development of physical structures that would impede such a plan.

f. Would not conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

The proposed site is bordered by unpaved roads with no public transit, bicycle, or pedestrian facilities.

2.18 Tribal Cultural Resources

The following discussion is from the April 2017, Archaeological Phase I Report, refer to Appendix E and Section 2.6 of this Initial Study.

2.18.1 Introduction

To comply with listed regulations and guidelines, the Agency conducted a Phase I cultural resources assessment consisting of archival research, a Native American contact program including AB 52 Government to Government consultations, and a field survey to identify and mitigate impacts to cultural resources within the Project Area. The records search revealed that seven cultural resources investigations were previously conducted encompassing approximately half of the Project Area. Three previously recorded cultural resources were identified within the Study Area. One of these (P-19-004154) which consists of the East Branch of the California Aqueduct was identified within the Project Area.

A Native American contact program was implemented by AECOM and the Agency as part of the cultural resources assessment for the Project and included Government to Government Consultations with two tribal groups which requested formal notification. This program consisted of first contacting the Native American Heritage Commission (NAHC) to request a Sacred Lands File check and list of relevant Native American groups or individuals that might potentially have additional information or concerns relevant to the Project Area. An informational letter, response form, and map were sent to five Native American representatives designated by the NAHC. four responses have been received to date. Two had no comment, one indicated interest in receiving the final report, and one requested AB 52 consultation. None of the responses indicated that the Project Area exhibited sensitivity for tribal cultural resources.

The Agency and AECOM sought to identify impacts to tribal cultural resources within the project area. No prehistoric or historic sites of Native American origin which might include tribal cultural resources were identified within the Study Area during the archaeological records search at the South Central Coastal Information Center and Southern San Joaquin Valley Information Center.

At the time of the commissioning of this Initial Study, one Native American body has requested formal consultation with the Agency and a second one has asked to be notified on projects within its territorial boundaries. Currently, consultations between the Agency and Native American tribal bodies are in progress.

As part of the cultural resources field investigation, a pedestrian survey was conducted from March 20, 2017, through April 7, 2017, to identify the presence of any cultural resources in the Project Area. The field-intensive pedestrian study identified six new cultural resources within this footprint consisting of two prehistoric isolates and four historic sites. Refer to Section 2.6 for a description of these finds.

2.18.2 Potential Impacts

Based on the results of the archival research and survey, there is low potential that archaeological resources will be encountered during ground disturbing activities for the proposed project. No sites or objects of Native American origin were identified during the archival research, which included a complete CHRIS search conducted by AECOM and a Sacred Lands File search conducted by the NAHC. In addition, no published or unpublished material was found which indicated the possible existence of tribal cultural resources (which may include geographic features) within the Project Area. However, inadvertent unidentified tribal cultural resources may be found in the Project Area during ground disturbance.

If any Native American cultural material is encountered within the Project Area, consultation with interested Native American parties will be conducted to apprise them of any such findings and solicit any comments they may have regarding appropriate treatment and disposition of the resources. If human remains are discovered, work in the immediate vicinity of the discovery should be suspended, and the Los Angeles County Coroner contacted. The Coroner will communicate with the NAHC and identify a Most Likely Descendant under PRC Section 5097.98 and California Code of Regulations Section 15064.5 if the remains are considered Native American in origin.

2.18.3 Management and Mitigation

The Agency will use the following mitigation measures to lessen the impact of significance to tribal cultural resources.

TCR-1: Inadvertent Finds –

1. If human remains or funerary objects are encountered during any activities associated with the project, work in the immediate vicinity (within a 100-foot buffer of the find) shall cease and the County Coroner shall be contacted pursuant to State Health and Safety Code §7050.5 and that code enforced for the duration of the project.

2. In the event that Native American cultural resources are discovered during project activities, all work in the immediate vicinity of the find (within a 60-foot buffer) shall cease and a qualified archaeologist meeting Secretary of Interior (SOI) standards shall be hired to assess the find. Work on the other portions of the project outside of the buffered area may continue during this assessment period. Additionally, San Manuel Band of Mission Indians will be contacted if any such find occurs and be provided information and permitted/invited to perform a site visit when the archaeologist makes his/her assessment, so as to provide Tribal input.

3. If significant Native American historical resources, as defined by CEQA (as amended, 2015), are discovered and avoidance cannot be ensured, an SOI-qualified archaeologist shall be retained to develop a cultural resources Treatment Plan, as well as a Discovery and Monitoring Plan, the drafts of which shall be provided to San Manuel Band of Mission Indians for review and comment.

a. All in-field investigations, assessments, and/or data recovery enacted pursuant to the finalized Treatment Plan shall be monitored by a San Manuel Band of Mission Indians Tribal Participant(s).
b. The Lead Agency and/or applicant shall, in good faith, consult with San Manuel Band of Mission Indians on the disposition and treatment of any artifacts or other cultural materials encountered during the project.

2.18.4 CEQA Significance

Based on the analysis of the potential effects of the proposed Project, the Initial Study concludes that with mitigation measures in place, the impact to tribal cultural resources will be less than significant and that the Project:

a. Would not cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

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

a – Records search and field surveys did not find the existence of tribal cultural resources. Unknown buried cultural resources may possibly be affected by the Project, however, the incorporation of management and monitoring protocols will reduce this to less than significant.

2.19 Utilities and Service Systems

2.19.1 Introduction

The proposed Project site is currently undeveloped and is not served by public water, wastewater, stormwater, and solid waste collection facilities. Therefore, these services and facilities are not discussed further here. Utility services for those few single family homes within and near the vicinity of the proposed Project area are privately served. Domestic water is provided by private groundwater wells. Irrigation water for farming is provided by irrigation groundwater wells and or surface water from the California Aqueduct. Wastewater disposal is managed through the use of septic systems. The nearest landfill (Kern County Landfill) is located about 20 miles west of the project. There are no oil and gas facilities known to

occur in the proposed Project area. Powerlines run through the southern boundary of the proposed Project area on the north side of the California Aqueduct Right of Way.

The proposed Project consisting of storing surface water during wet weather year periods and recovering the stored water during dry weather year periods will not require an expansion of the capacity of the California Aqueduct and its pumping facilities which is the source for recharge operations and the point of delivery for recovery operations. Recharge and recovery operations will stay within the capacity of the California Aqueduct and the Agency and its partners capacity allocations.

2.19.2 Potential Impacts

The proposed Project would not increase demand for utilities and service systems including water, wastewater, stormwater, and solid waste management. The proposed Project would utilize electric water pumps that are anticipated to be served off the existing grid system running along the southern boundary of the proposed Project. This new electric demand may require the expansion of the existing power grid to meet the new power demands of the proposed project. Additionally, new electric lines would be required to connect the various well pumps and pump station to the existing grid.

2.19.3 Mitigation

To minimize any impacts associated with the expansion that may be required of the existing electrical grid system and the construction of the new electrical lines to connect the various wells and pump station to the existing electrical grid, the Agency will implement the following mitigation measure:

UTIL-1: Electrical Service Upgrade Minimization Measures – In the event that the existing electrical grid system needs to be expanded to meet the proposed project demands, the Agency will require that the Electric Company comply with all mitigation measures identified in this Initial Study during the construction of the expansion.

2.19.4 CEQA Significance

Based on the analysis of the potential effects of the proposed Project, the Initial Study concludes that with mitigation measures in place, there are no anticipated potential significant impacts to utilities and services systems as a result of the proposed Project and that the project:

a. Would not exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.

There are no wastewater treatment facilities associated with this Project.

b. Would not require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

There are no new or an expansion to existing water or wastewater treatment facilities associated with this project.

c. Would not require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

There are no new or an expansion to existing storm water drainage facilities associated with this project.

d. Would have sufficient water supplies available to serve the project from existing entitlements and resources, no new or expanded entitlements needed.

Water for the project will come from the Agency and its partners State Water Project allocations. There is no new demand for water associated with this project.

e. Would not 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.

There is no wastewater treatment required from the proposed project. The amount of wastewater that may be generated by a bathroom for the bank operator at the site will be insignificant and will be disposed by means of a septic system.

f. Would not be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs.

g. Would comply with federal, state, and local statutes and regulations related to solid waste.

f & g - Other than during construction operations, there are no permanent solid waste disposal needs for the operation of this project.

2.20 Mandatory findings of Significance

2.20.1 Introduction

This Section of the Initial Study evaluates the project specific and cumulative impacts associated with the proposed Project. Refer to Appendix B for the completed CEQA Checklist. Additionally, Appendix G summarizes the "No Impact" and "Less than Significant Impact" determinations as evaluated in this Initial Study.

2.20.2 Potential Impacts

Implementation of the proposed project could potentially result in impacts to sensitive species. The project also may potentially result in impacts to unknown cultural resources. Any degradation of the quality of the environment would be reduced to below a level of significance through implementation of the mitigation measures identified in the respective sections of this Initial Study.

Cumulative impacts are considered as two or more individual project effects that, when considered together with other projects combine to result in a significant impact within an identified region. In order for a project to contribute to cumulative impacts, it must result in some level of impact on a project specific level. For the most part the proposed Project will cause no impact to aesthetics, land use and planning, mineral resources, population and housing, public services, recreation, and transportation and traffic.

Potential regional cumulative effects were considered for the topics of agricultural and forest, air quality, biological, cultural, greenhouse gas, geology and soils, hazards and hazardous conditions, hydrology and water quality, noise, and utilities and service systems for which the project was found to result in less than significant impacts with mitigation.

- Agricultural and Forest Resources – The project would not remove existing active farmland. Farmland designated as Prime will remain but given its current state may be used for recharge operations which are consistent with agricultural uses.

- Air Quality / Green House Gas Emissions – The generation of criteria pollutants is considered to be a cumulative impact as it contributes to impacts from past, present, and future projects in the region, state, nation, and world. Regional air quality management plans provide air quality thresholds to minimize such cumulative impacts. With mitigation measures, the proposed project does not exceed such designated thresholds and thus the cumulative impact is considered to be less than significant.

- Biological – Conducting ground disturbance and the introduction of noise and human presence to the area may result in project related impacts to sensitive species. The project would implement mitigation to reduce potential impacts to less than significant levels. Potential impacts to these biological resources occurring as a result of past, present, and future development also would require mitigation; thus, project related impacts to biological resources would be less than cumulatively considerable.

- Cultural – Conducting ground disturbance may result in project related impacts to unknown cultural resources. The project would implement mitigation to reduce potential impacts to less than significant levels. Potential impacts to cultural resources occurring as a result of past, present, and future development would also require mitigation; thus, project related impacts to cultural resources would be less than cumulatively considerable.

- Geology and Soils – With mitigation measures, impacts associated with erosion are inherently restricted to the project area and would not contribute to cumulative impacts associated with other planned or proposed development. The Project has the potential to raise the groundwater table to levels that increase the potential for liquefaction of the soils. Groundwater table levels are expected to increase as far as 8 miles east of the site. The Agency is proposing mitigation measures to monitor these levels and take necessary action. This issue is confined to the nearby area and is not anticipated to contribute to a cumulative impact.

- Hazards and Hazardous Materials – In the event that the Project would result in accidental discharge associated with transport, use, storage, and/or disposal of hazardous materials during construction or operation of the facility, there are prescribed activities to be conducted in accordance with NPDES Construction General Permit, as well as the associated project SWPPP prepared for the project, that would reduce impacts associated with the discharge of contaminants to less than a level of significance. With mitigation measures in place, hazards associated with mosquitos and bird strikes to military operations are not anticipated to have a cumulative impact to the region as other past, present, and future projects would require similar mitigation measure implementation.

- Hydrology and Water Quality – Potential water quality impacts associated with the proposed project would include short term construction related erosion/sedimentation with no potential long term impacts to water quality anticipated. The project would also result in minor modifications to onsite drainage. These minor modifications would not result in an increased risk of flooding or cumulatively considerable impacts. Implementation of a SWPPP and BMPs as part of project conformance with NPDES permit conditions would effectively eliminate the potential for drainage and water quality related impacts. The project also involves the import of SWP water into the local groundwater supply and the export of blended water supplies back to the California Aqueduct. A comparison of water qualities for both supplies shows that the import / export operations are not anticipated to substantially change the beneficial use of either of the water supplies before or after the operation. No cumulative impacts are anticipated.

- Noise – Considering that noise impacts within the project vicinity are regulated by the General Plan and Los Angeles County Municipal Code and that the project would incorporate mitigation measures to reduce construction and operational noise impacts to less than significant levels, the project would not incrementally contribute to a significant cumulative noise impact.

- Utilities and Service Systems – Other than a possible expansion of the electrical grid system to serve the proposed Project, there are no additional needs for any utilities and service systems. The cumulative impacts associated with the construction of the possible expansion would be covered under the other resources evaluated.

Because of the general lack of ongoing development projects within the project vicinity, it is unlikely that localized cumulative impacts would occur. For these reasons, impacts associated with cumulative effects would be less than significant.

2.20.3 Mitigation

There are no additional mitigation measures anticipated as a result of evaluation of the project as a whole and considering any cumulative impacts.

2.20.4 CEQA Significance

Based on the analysis of the potential effects of the proposed Project, the Initial Study concludes that with mitigation measures in place, there are no anticipated potential significant cumulative impacts to the environment as a result of the proposed Project and that the project

a. Would not have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory.

There are no waters within the project site that have the ability to support suitable habitat for fish. The potential impacts to wildlife and plant species will be mitigated to a level which would be considered less than significant. Though the potential to encounter cultural resources is low to moderate, mitigation measures will be implemented to minimize the impacts of unknown cultural resources to a level which is less than significant.

b. Would not 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 proposed Project is not inconsistent with regional land use plans including land use, zoning, and minerals. The impacts associated with this project will be mitigated and the same is understood to have taken place for past and expected for future projects. Refer to Section 2.19.2 for additional details of the evaluation of cumulative impacts for each of the affected resources.

c. Would not have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly.

With the exception of noise impacts to adjacent residences, the project would not consist of any use or activities that would negatively affect any persons in the vicinity. Mitigation measures identified in this Initial Study, would reduce noise impacts to less than significant levels. In addition, all resource topics associated with the project have been analyzed in accordance with State CEQA Guidelines and found to pose no impact, less than significant impact, or less than significant impact with mitigation. Consequently, the project would not result in any environmental effects that would cause substantial adverse effects on human beings directly or indirectly; therefore, the impact would be less than significant.

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SECTION 3
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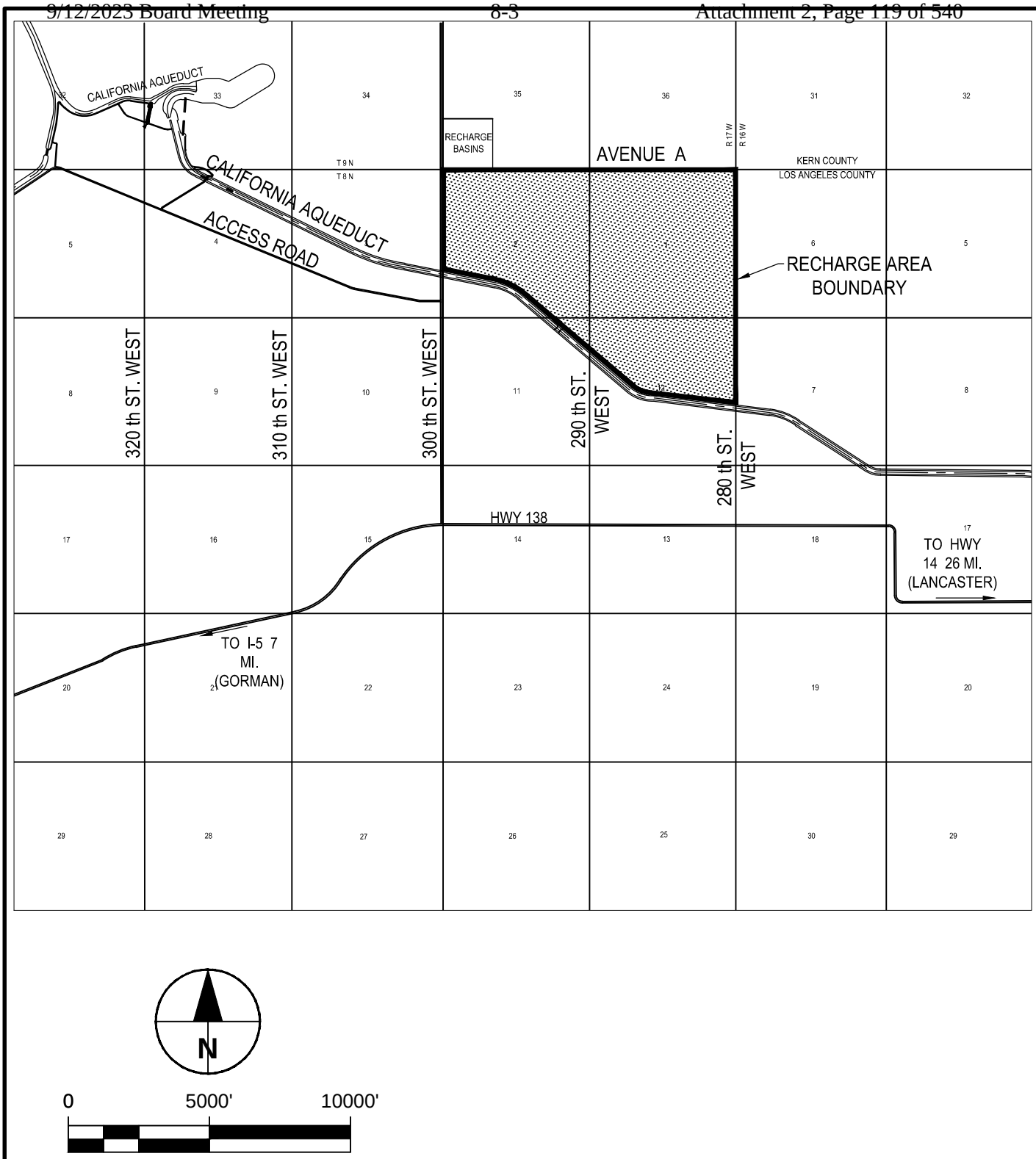
Appendix A: Figures



ANTELOPE VALLEY-EAST KERN WATER AGENCY
HIGH DESERT WATER BANK
VICINITY MAP
60537613

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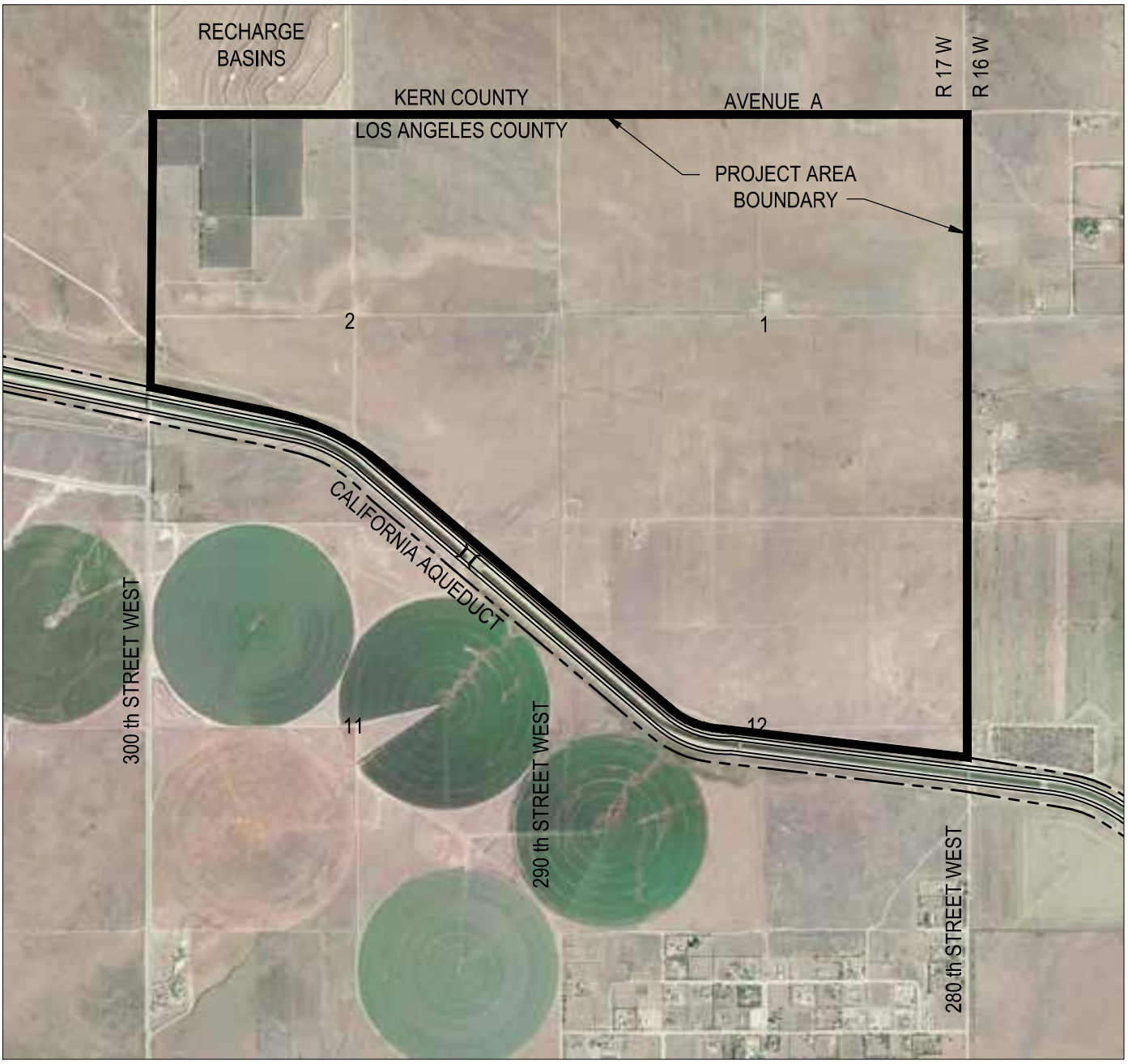
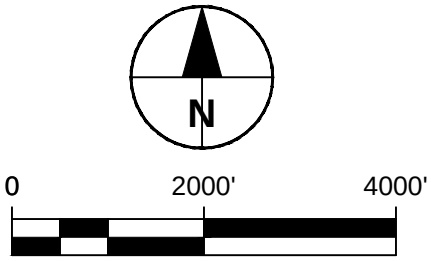
FIGURE 1A





ANTELOPE VALLEY-EAST KERN WATER AGENCY
HIGH DESERT WATER BANK
AERIAL VICINITY MAP
60537613

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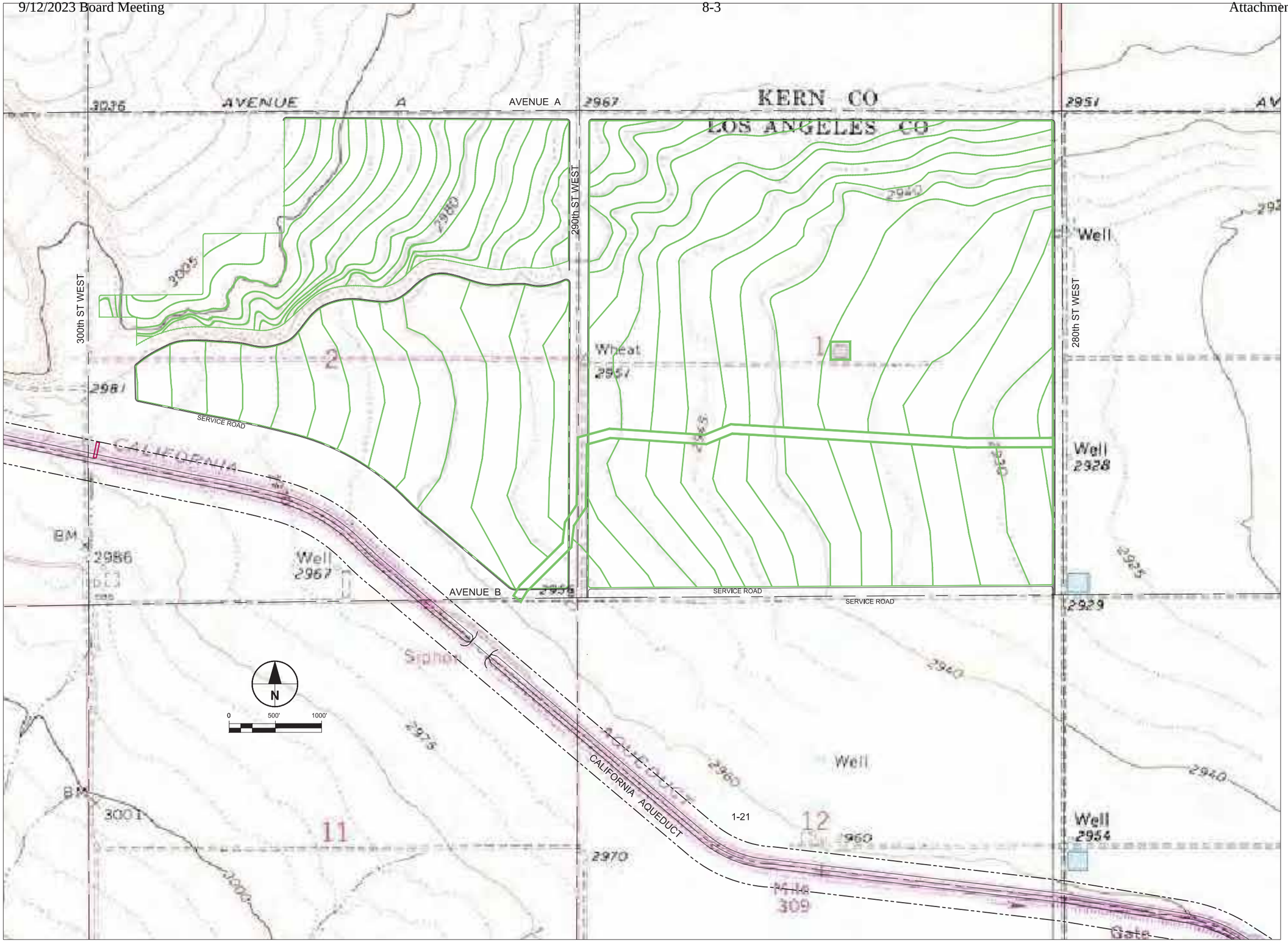
FIGURE 1B



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PROJECT

HIGH DESERT WATER BANK

PROJECT NUMBER

60537613

SHEET TITLE

SCHEMATIC FLOOD RECHARGE OPERATIONS

SHEET NUMBER

FIGURE 2

ANSI D 22" x 34"

Project Management Initials: Designer:____ Checked:____ Approved:____

ved by: CAMPBELLV Last Plotted: 2017-11-30
...ne: S:\AD\160537613 - ENTERPRISE WATERBANK CEQA\900 WORKINGDOCS-CAD\03-SKETCHES\60537613-FIG-2.DWG

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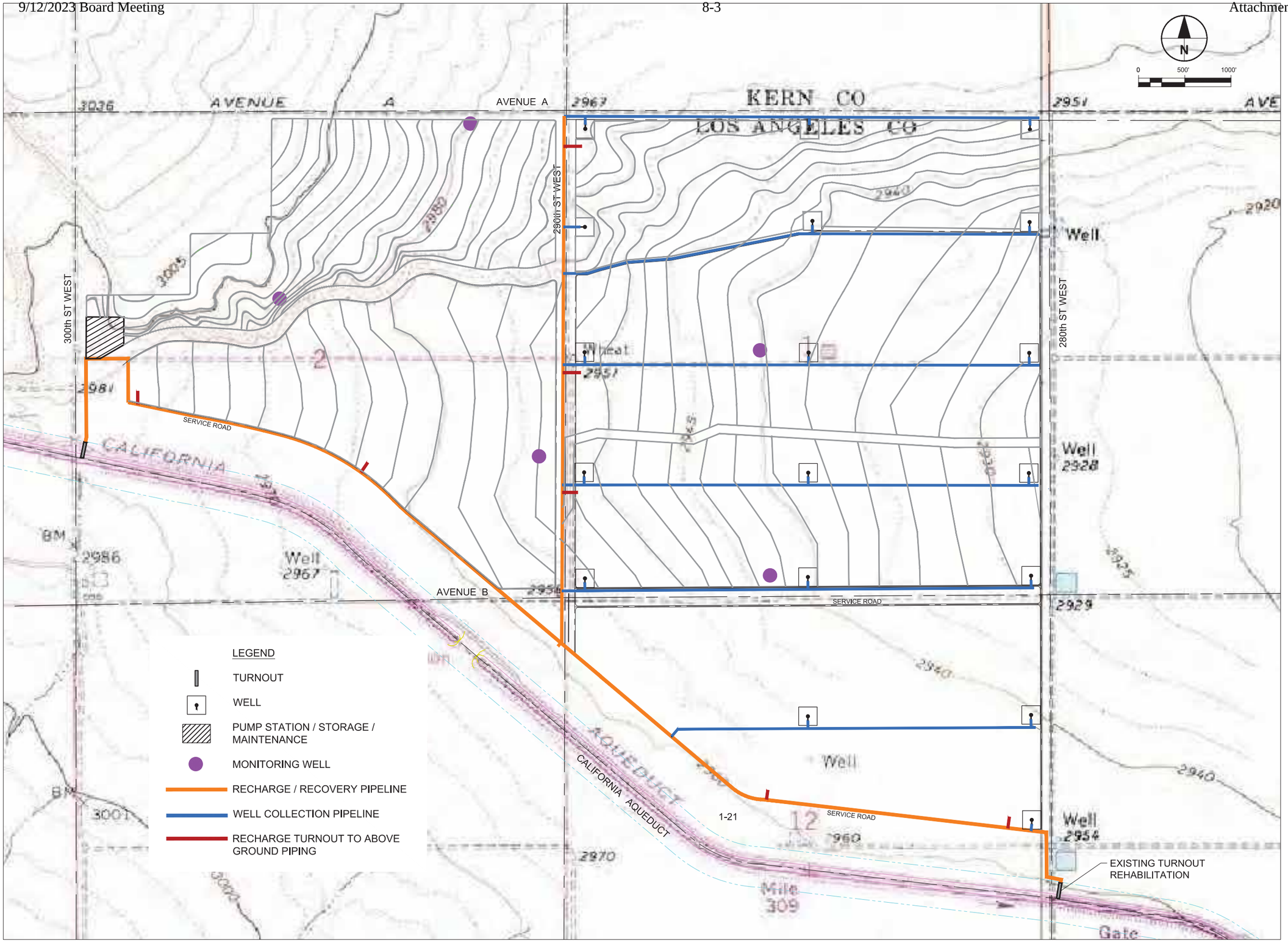

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PROJECT

HIGH DESERT WATER BANK

PROJECT NUMBER

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SHEET TITLE

SCHEMATIC OF PROPOSED PROJECT FACILITIES MAP

SHEET NUMBER

FIGURE 3

ANSI D 22" x 34"

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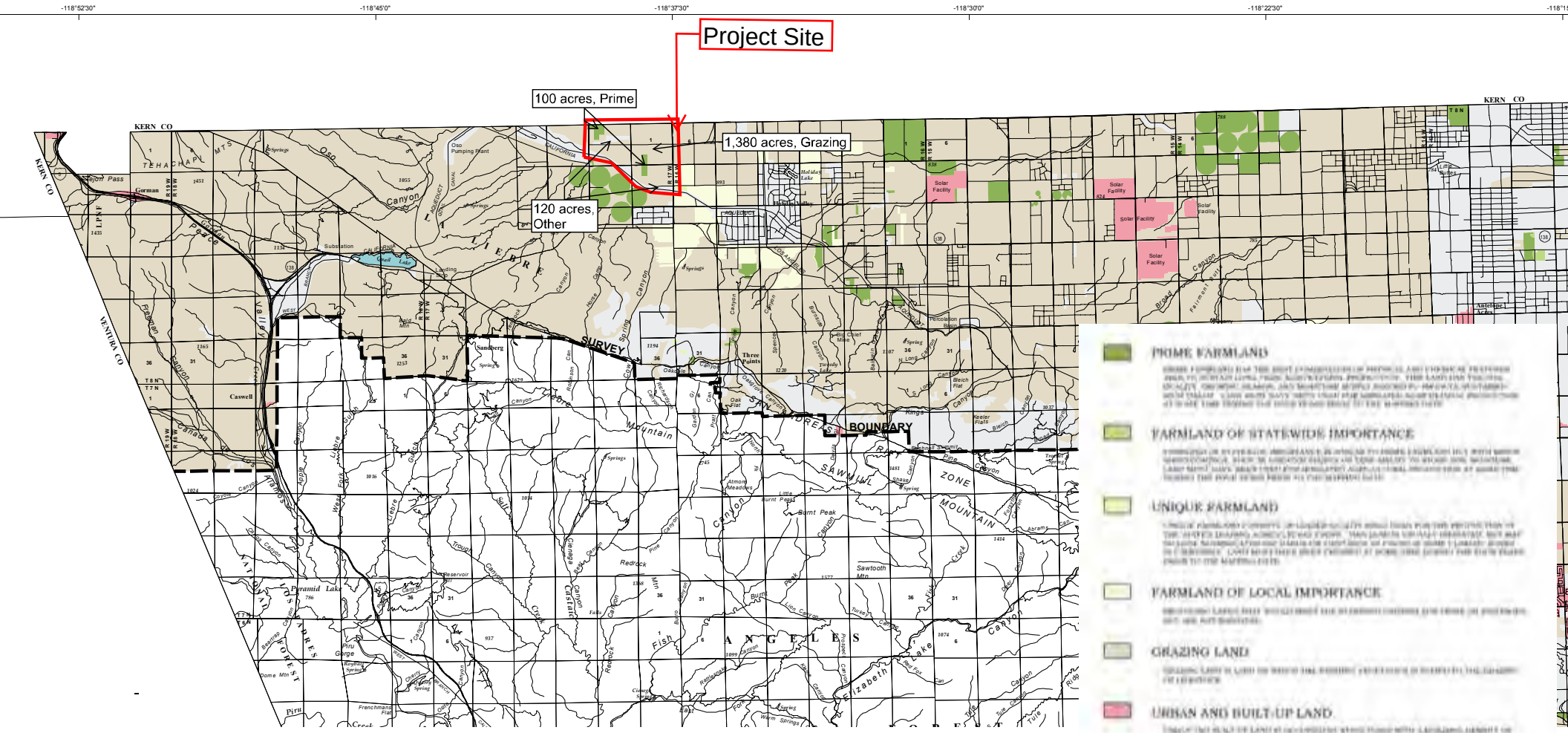
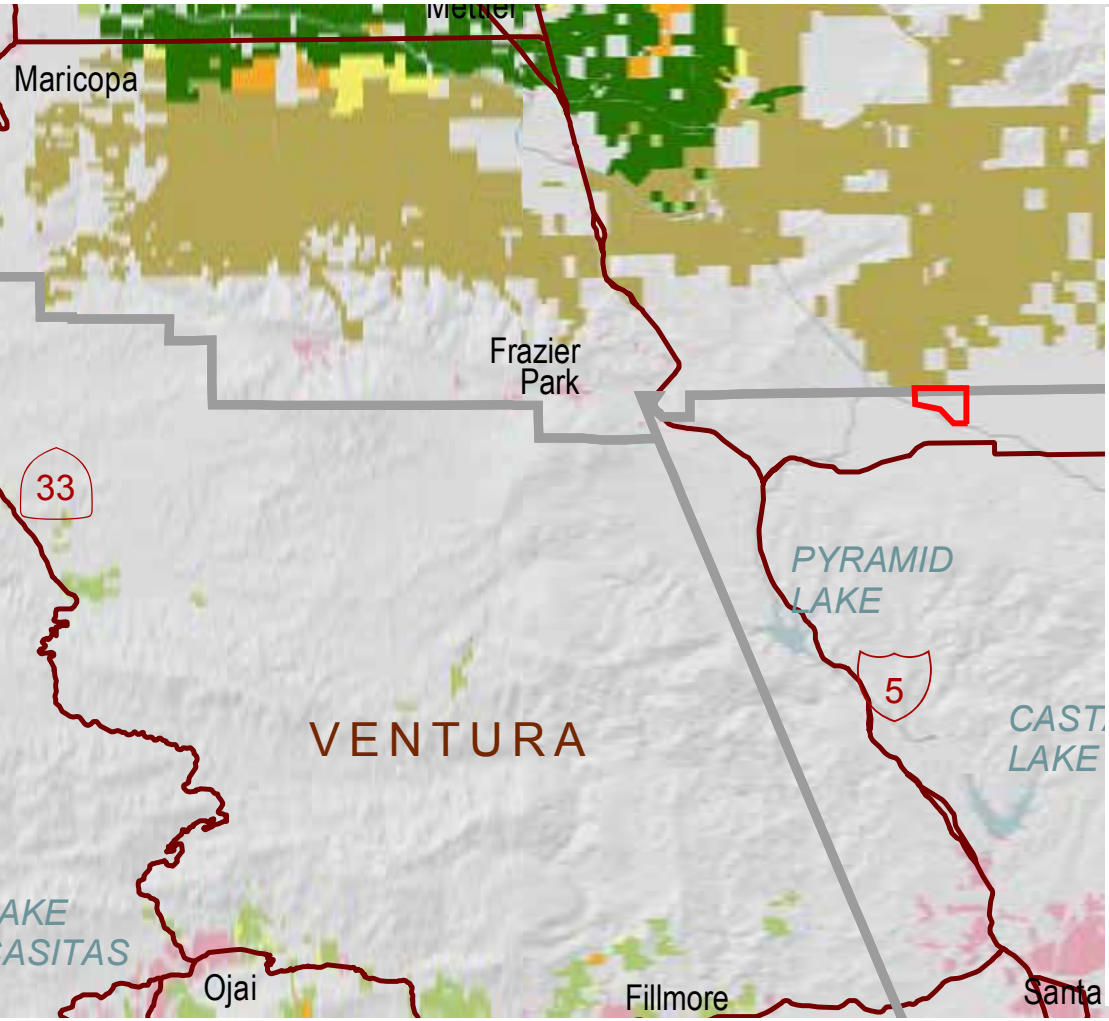
ANTELOPE VALLEY - EAST KERN WATER AGENCY
HIGH DESERT WATER BANK
LOS ANGELES COUNTY IMPORTANT FARMLAND MAP

FIGURE 4



ANTELOPE VALLEY - EAST KERN WATER AGENCY HIGH DESERT WATER BANK WILLIAMSON ACT CONTRACT LAND MAP

FIGURE 5



WILLIAMSON ACT- PRIME AGRICULTURAL LAND

Land which is enrolled under California Land Conservation Act contract and meets any of the following criteria (as set forth under California Government Code Section 51201):
1: Land which qualifies for rating as class I or class II in the Natural Resources Conservation Service land use capability classifications;
2: Land which qualifies for rating 80 to 100 in the Storie Index Rating;
3: Land which supports livestock used for the production of food and fiber and which has an annual carrying capacity equivalent to at least one animal unit per acre as defined by the United States Department of Agriculture;
4: Land planted with fruit or nut-bearing trees, vines, bushes or crops which have a nonbearing period of less than five years and which will normally return during the commercial bearing period on an annual basis from the production of unprocessed agricultural plant production not less than two hundred dollars per acre;
5: Land which has returned from the production of unprocessed agricultural plant production and has an annual gross value of not less than two hundred dollars per acre for three of the previous five years.

WILLIAMSON ACT- NON - PRIME AGRICULTURAL LAND

Land which is enrolled under California Land Conservation Act contract and does not meet any of the criteria for classification as Prime Agricultural Land. Non-Prime Land is defined as Open Space Land of Statewide Significance under the California Open Space Subvention Act (see California Government Code Section 16143), and may be identified as such in other documents. Most Non-Prime Land is in agricultural uses such as grazing or non-irrigated crops. However, Non-Prime Land may also include other open space uses which are compatible with agriculture and consistent with local general plans.

WILLIAMSON ACT- FARMLAND SECURITY ZONE (FSZ)

Enrolled parcels containing either Prime or Non-Prime agricultural land restricted by a 20 year contract pursuant to Government Code Section 51296.

WILLIAMSON ACT- MIXED ENROLLMENT AGRICULTURAL LAND

Enrolled lands containing a combination of Prime, Non-Prime, Open Space Easement, or other contracted or enrolled lands not yet delineated by the county.

WILLIAMSON ACT- NON-RENEWAL

Enrolled lands for which non-renewal has been filed pursuant to Government Code Section 51245. Upon the filing of non-renewal, the existing contract remains in effect for the balance of the period remaining on the contract. During the non-renewal process, the annual tax assesment gradually increases. At the end of the 9 year non-renewal period (or 19 year non-renewal period if FSZ), the contract expires and the land is no longer enforceably restricted.

NON-ENROLLED LAND

Land not enrolled in a Williamson Act contract and not mapped by Farmland Mapping & Monitoring Program (FMMP) as Urban and Built-Up Land or Water.

URBAN AND BUILT-UP LAND

Urban and Built-Up Land is occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel. Common examples include residential, industrial, commercial, institutional facilities, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, and water control structures. This definition and extent of mapping is derived from the latest Farmland Mapping and Monitoring Program Important Farmland Maps.

WATER

Perennial water bodies with an extent of at least 40 acres. This definition and extent of mapping is derived from the latest Farmland Mapping and Monitoring Program Important Farmland Maps.

STATE OF CALIFORNIA WILLIAMSON ACT CONTRACT LAND

DATA SUBMISSIONS CURRENT TO 2014

STATE OF CALIFORNIA
Edmund G. Brown Jr., *Governor*
THE NATURAL RESOURCES AGENCY
John Laird, *Secretary*
DEPARTMENT OF CONSERVATION
David Bunn, *Director*

CALIFORNIA DEPARTMENT OF CONSERVATION
DIVISION OF LAND RESOURCE PROTECTION
CONSERVATION PROGRAM SUPPORT

Legend

Proposed Project Area

100-ft Buffer

Soil

- HcA: Hanford sandy loam, 0 to 2 percent slopes
- OaC: Oakdale sandy loam, 2 to 9 percent slopes
- ObC: Oak Glen sandy loam, 2 to 9 percent slopes
- VaA: Vernalis sandy loam, 0 to 2 percent slopes
- VbA: Vernalis loam, 0 to 2 percent slopes
- VcA: Vernalis clay loam, 0 to 2 percent slopes

0 0.1 0.2 0.4 Miles

N

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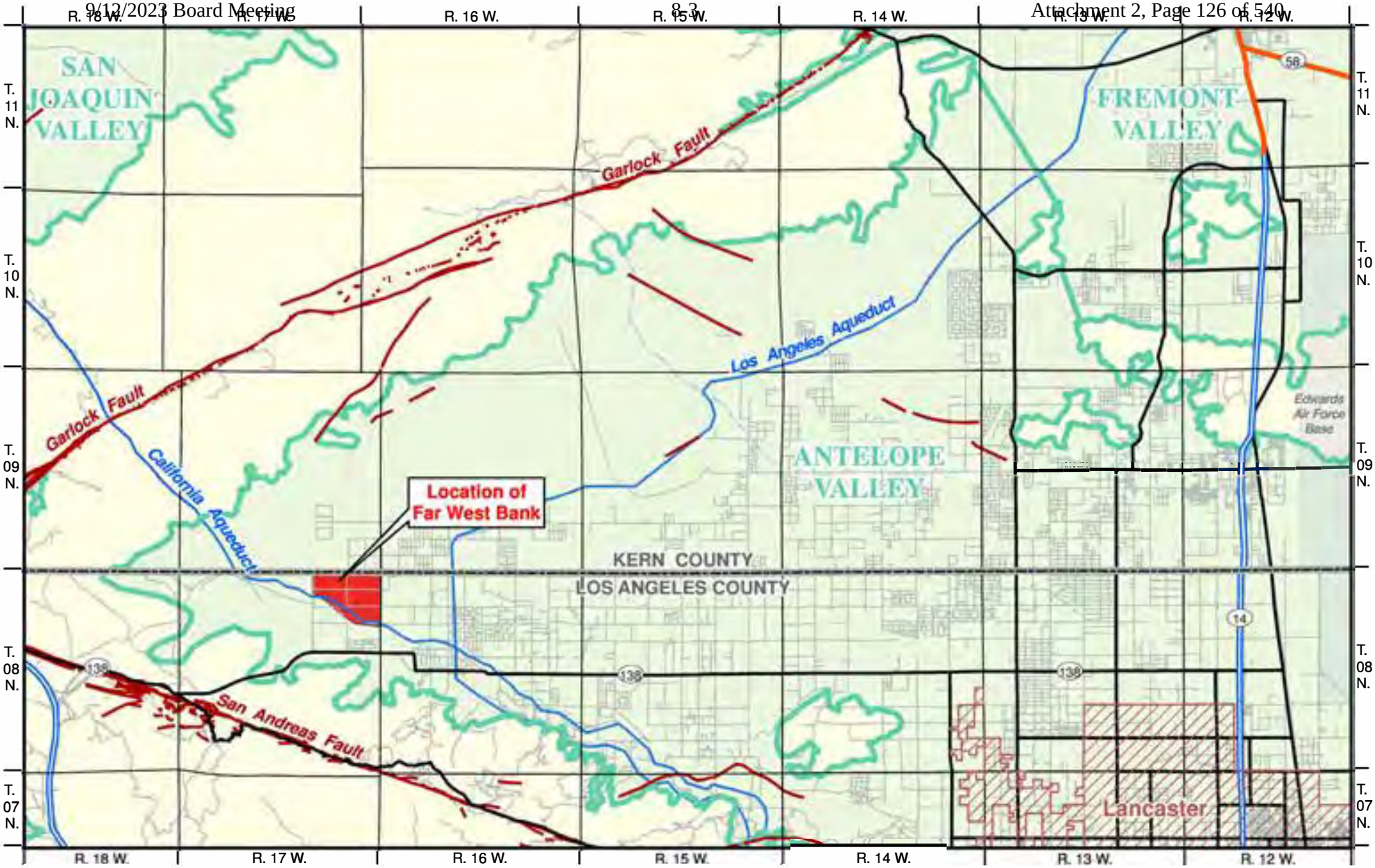
Antelope Valley - East Kern Water Agency
High Desert Water Bank
Soils Type Map

DRWG: Sara Snyder | Date: 5/3/2017 | Revision: 1

Figure 6



EXPLANATION

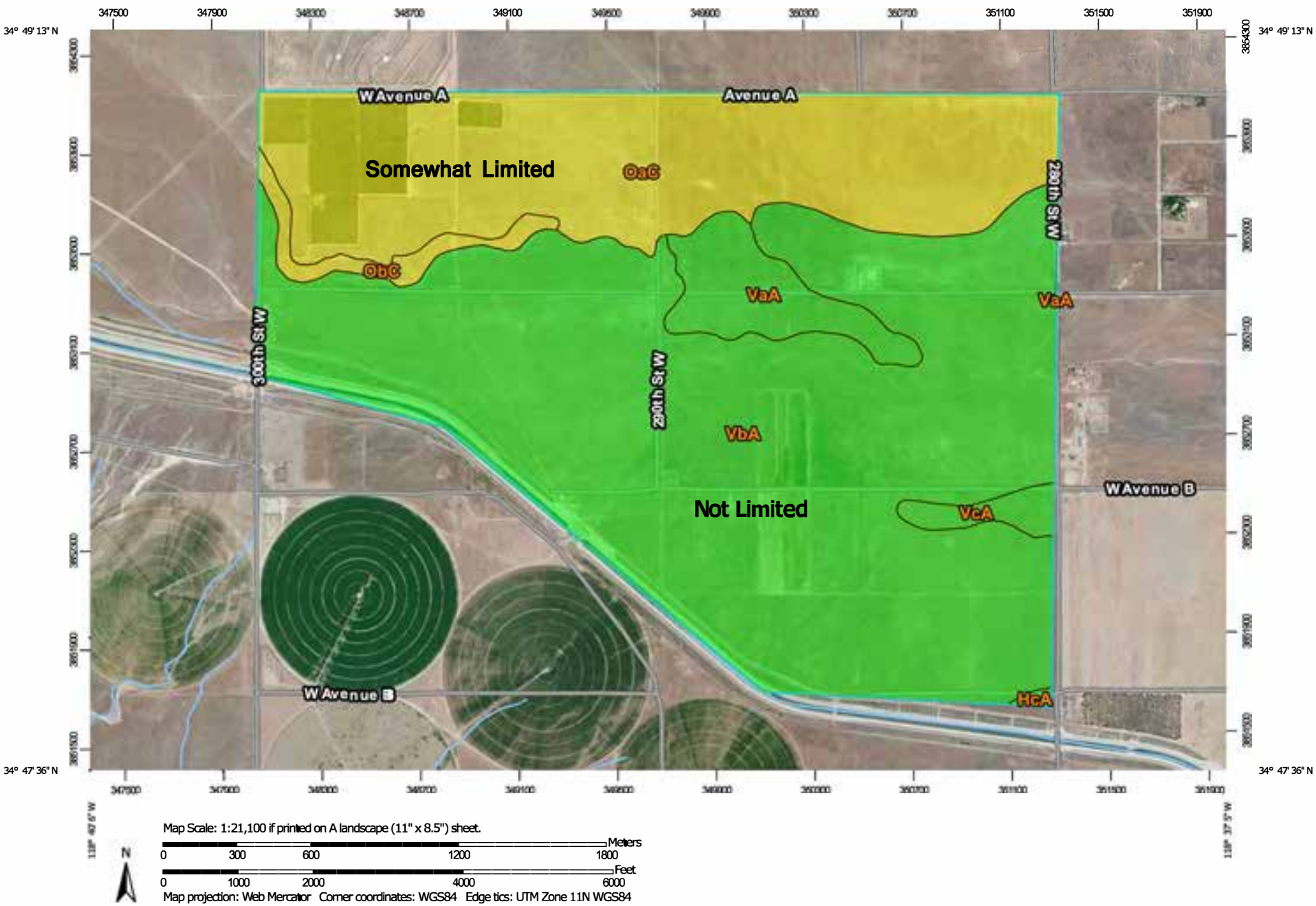
- Project Area
- Groundwater Basin
- Fault
- Limited Access
- Highway
- Major Road
- Local Road

N

0 1 2 3 4
Miles

FIGURE 7. SEISMIC HAZARDS MAP

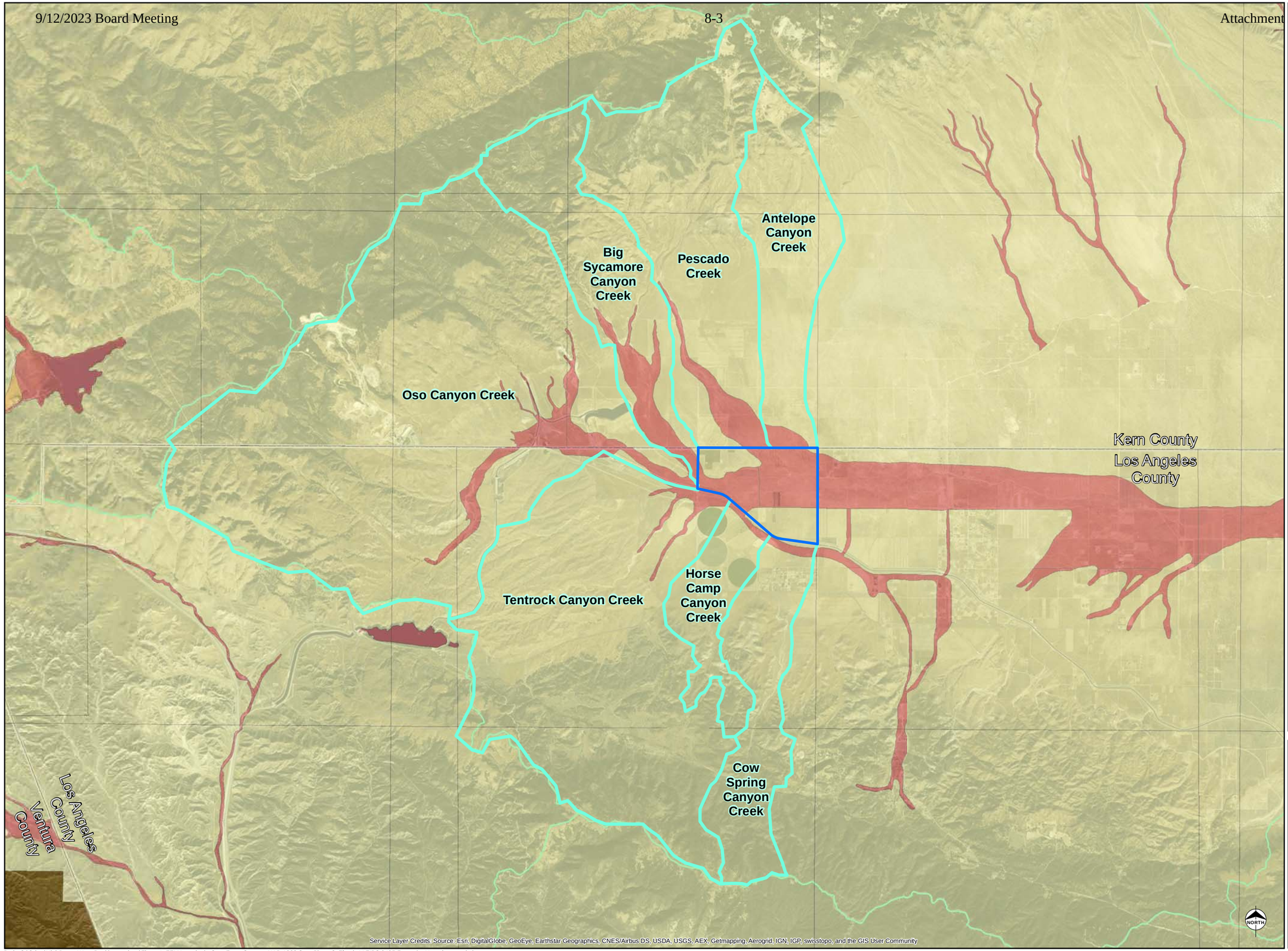
Antelope Valley — East Kern Water Agency
High Desert Water Bank
Site Development Limitations Map



USDA Natural Resources Conservation Service

Web Soil Survey
National Cooperative Soil Survey

FIGURE 8



Legend

- Project Area
- Watershed Boundary
- County Boundaries

FEMA Flood Zones

Moderate to Low Risk Areas

- X: Area determined to be outside the 100- and 500-yr floodplains
- X500: Area inundated by 500-yr flooding

High Risk Areas

- A: Area inundated by 100-yr flooding, for which no BFEs have been established

Undetermined Risk Areas

- D: Area of undetermined but possible flood hazards

Scale 1:96,000
1 inch = 8,000 feet

0 4,000 8,000 12,000
Feet

0 1,000 2,000 3,000
Meters

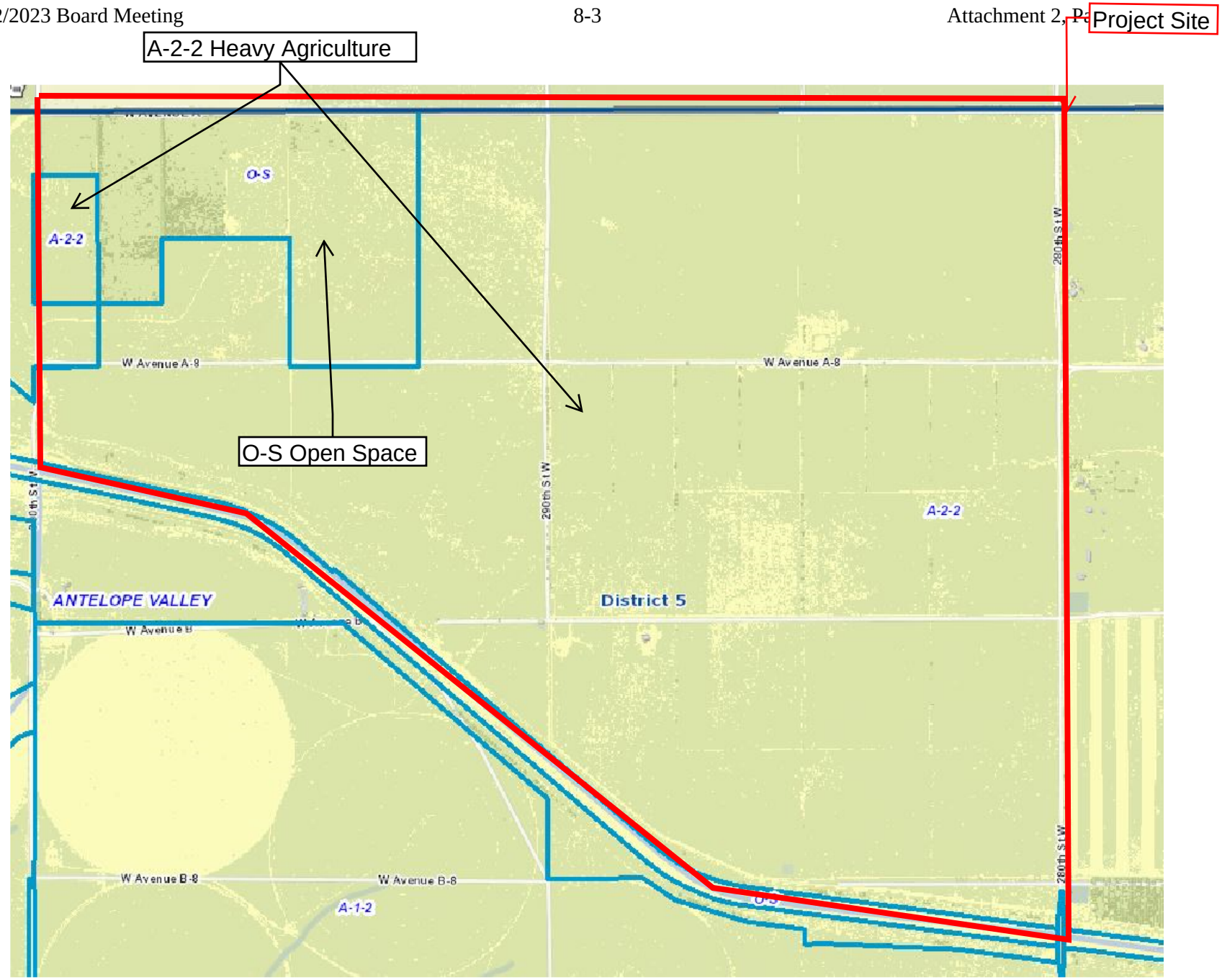
Antelope Valley - East Kern Water Agency
High Desert Water Bank

FEMA Flood Zones

AECOM

Figure 9

Path: G:\Other\HighDesertWaterBank\map_docs\Figure4_FEMA.mxd | Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet | User: jason.sokol



ANTELOPE VALLEY - EAST KERN WATER AGENCY
HIGH DESERT WATER BANK
ZONING MAP

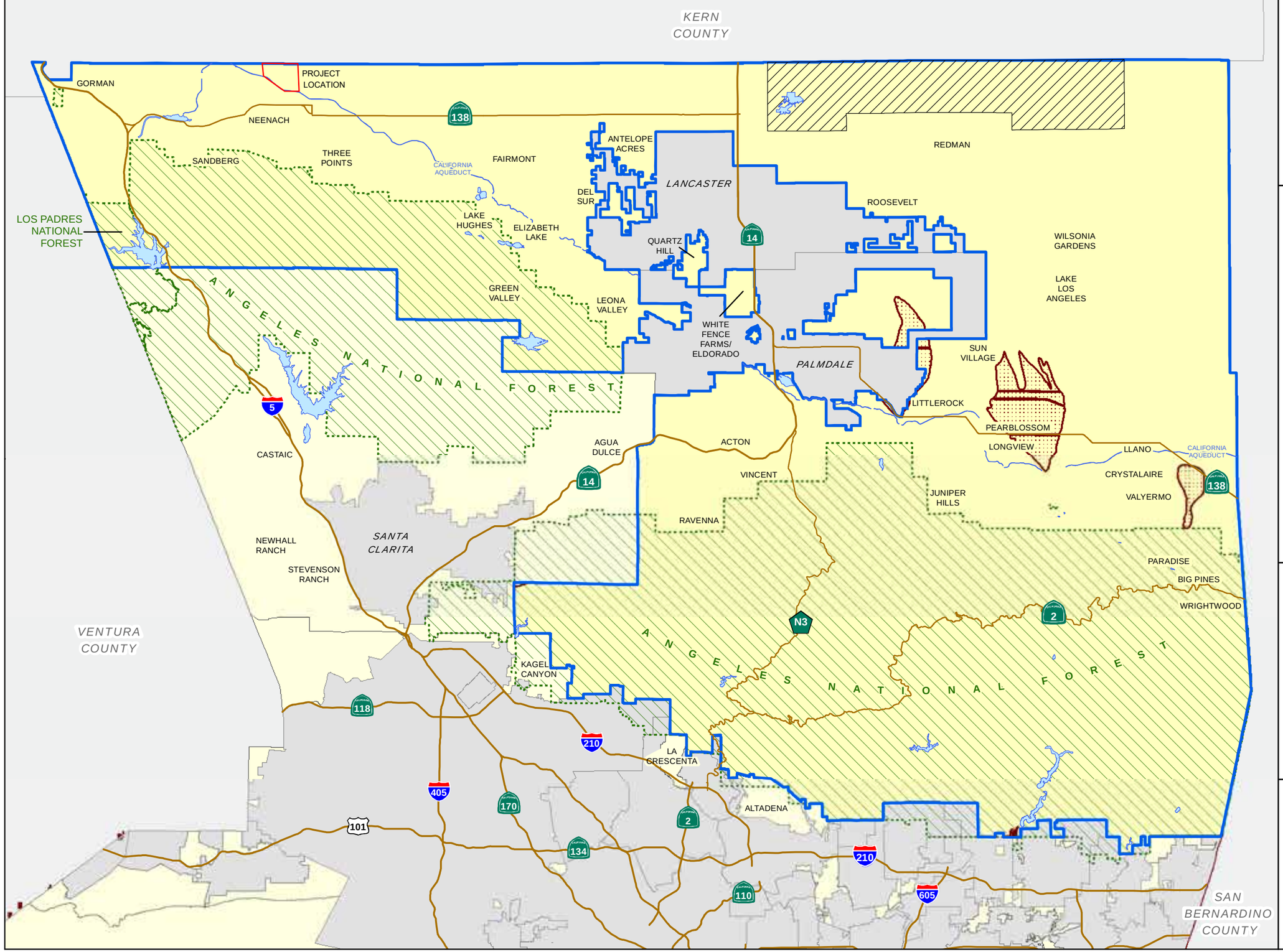
FIGURE 10

FIGURE 11

COUNTY OF LOS ANGELES

Town and Country Planning Area

Mineral Resource Zones



LEGEND:

- *Mineral Resource Zones**
- *Planning Area*
- *Incorporated Cities*
- *Other Unincorporated Area*
- *Edwards Air Force Base*
- *Lakes and Reservoirs*
- *National Forest*

* SOURCE: California Department of Conservation, Division of Mines and Geology

Note: This map is a component of the Los Angeles County Antelope Valley Area Plan Update Program (Town & Country).

Information within cities is for reference only.

LOS ANGELES COUNTY
Department of Regional Planning
320 W. Temple St.
Los Angeles, CA 90012

VICINITY MAP:

Current as of: 8/19/14

0 1 2 3 4 5
Miles

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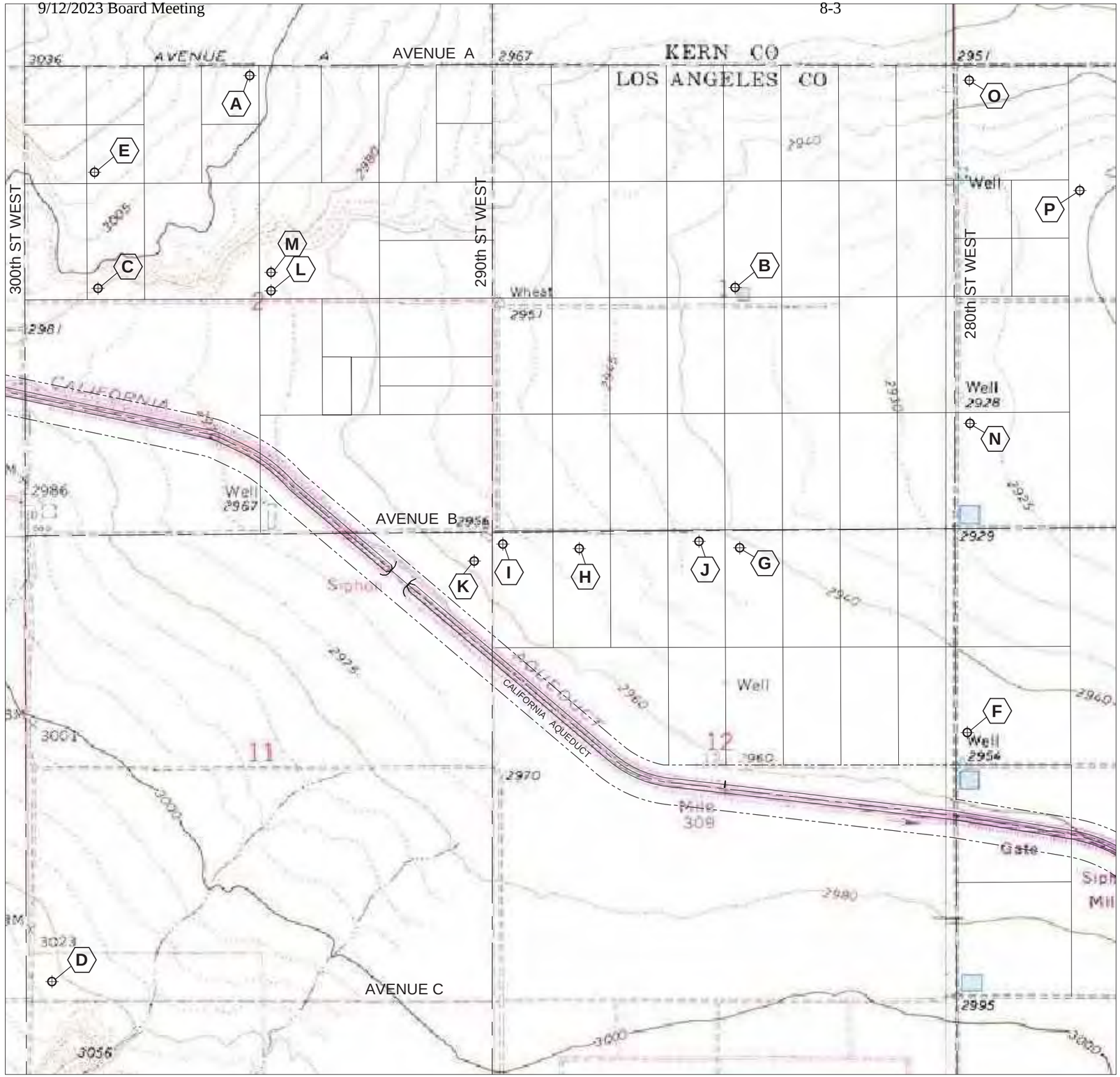

N

0 500' 1000'

LEGEND

G EXISTING WELL LOCATION

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PROJECT

HIGH DESERT WATER BANK

PROJECT NUMBER

60537613

SHEET TITLE

EXISTING WELL LOCATIONS

SHEET NUMBER

FIGURE 12

ANSI D 22" x 34"
Approved:
Checked:
Designer:
Project Management Initials:
Last Plotted: 2017-05-30
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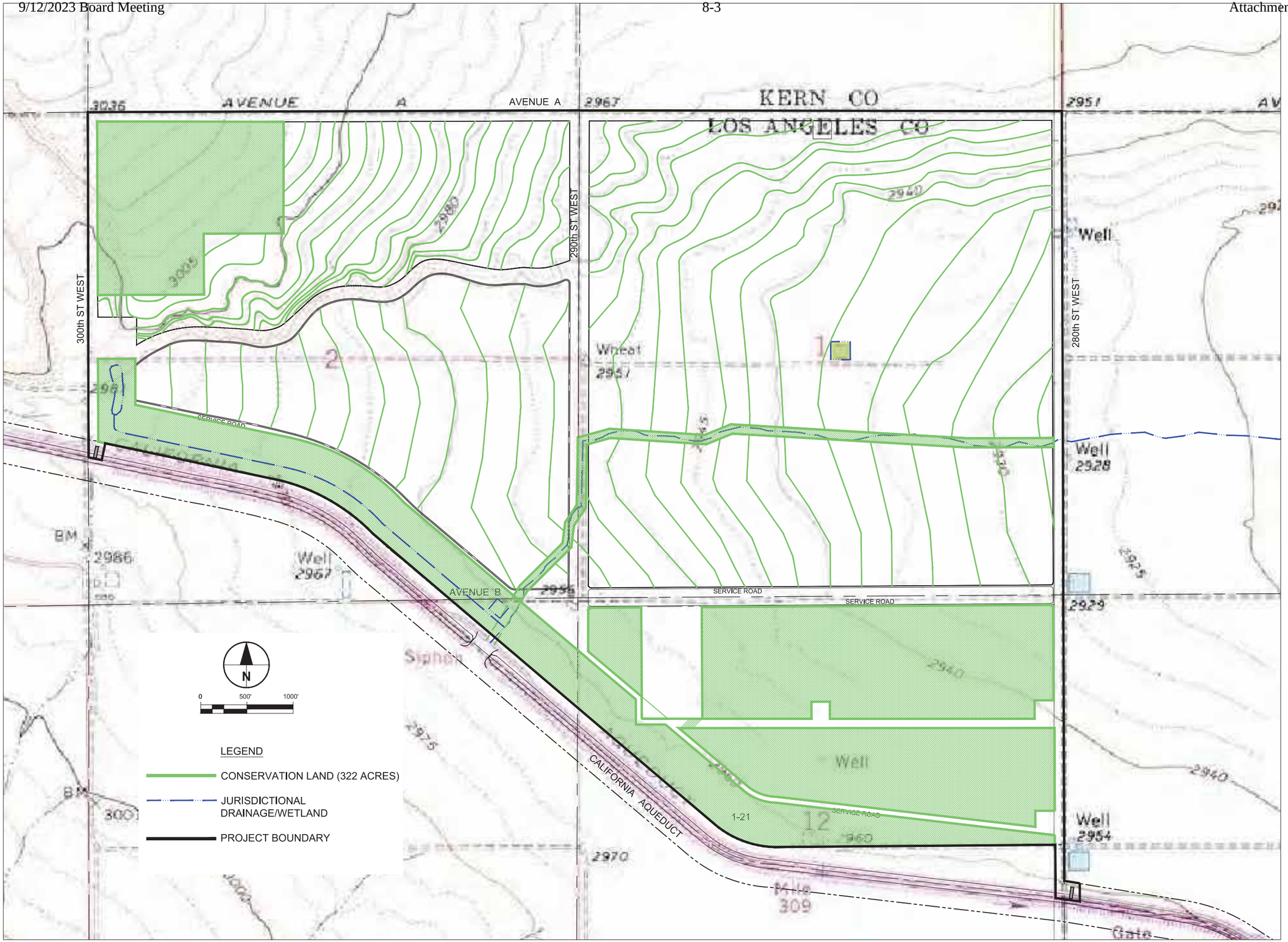

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PROJECT

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PROJECT NUMBER

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SHEET TITLE

CONSERVATION PLAN

SHEET NUMBER

FIGURE 13

ANSI D 22" x 34"

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ved by: CAMPBELLV Last Plotted: 2017-12-05
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0 30' 60'

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PROJECT

HIGH DESERT
WATER BANK

PROJECT NUMBER

60537614

SHEET TITLE

280th STREET WEST
TURNOUT MODIFICATIONS
PLAN

SHEET NUMBER

FIGURE 14

ANSI D 22" x 34"

Project Management Initials: Designer:_____ Checked:_____ Approved:_____

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0 30' 60'

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I/R	DATE	DESCRIPTION

PROJECT

HIGH DESERT
WATER BANK

PROJECT NUMBER

60537614

SHEET TITLE

300th STREET WEST TURNOU PLAN

SHEET NUMBER

FIGURE 15

ANSI D 22" x 34"

Approved:

Checked:

Designer:

Project Management Initials:

Last Plotted: 2017-09-20

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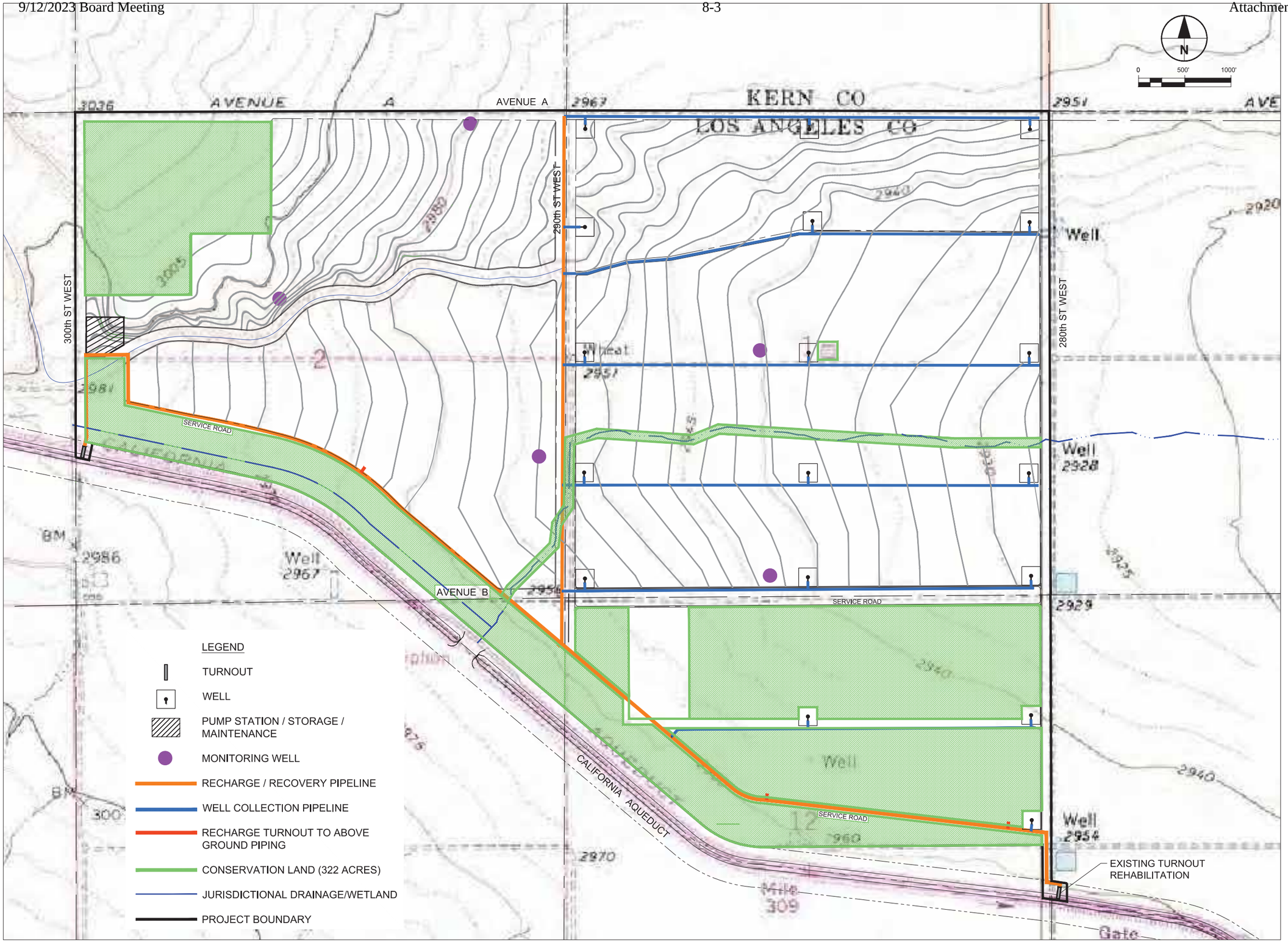

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I/R	DATE	DESCRIPTION
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PROJECT

HIGH DESERT WATER BANK

PROJECT NUMBER

60537613

SHEET TITLE

COMBINED
PROJECT FACILITIES MAP

SHEET NUMBER

FIGURE 16

ANSI D 22" x 34"

Project Management Initials: Designer: Checked: Approved:

ved by: CAMPBELLV Last Plotted: 2017-11-30
ME: S:\AO\160537613 - ENTERPRISE WATERBANK CEQA\900 WORKINGDOCS-CAD\03-SKETCHES\60537613-FIG-16.DWG

Appendix B: CEQA Checklist

ANTELOPE VALLEY – EAST KERN WATER AGENCY
CEQA CHECKLIST

High Desert Water Bank

PROJECT DESCRIPTION AND BACKGROUND

Project Title:	High Desert Water Bank
Lead Agency Name and Address:	Antelope Valley – East Kern Water Agency 6500 West Avenue N Palmdale, CA 93551
Contact Person and Phone Number:	Dwayne Chisam, General Manager (661) 943 3201
Project Location:	Portions of Sections 1, 2, 11, and 12 of Township 8 North, Range 17 West, northwest of the community of Neenach bounded by: Avenue A on the north,, 280th St. West on the east, 300th St. West on the west, and the California Aqueduct on the south.
Project sponsor's name and address:	Antelope Valley – East Kern Water Agency 6500 West Avenue N Palmdale, CA 93551
General Plan Description:	The General Plan designations within the project limits are Open Space Conservation (OS-C) and Rural Land (RL10).
Zoning:	A portion of the property in the northwest corner is zoned as Open Space (OS). The remainder of the proposed project site is zone as Heavy Agricultural (A-2-2).
Description of Project:	The Antelope Valley – East Kern Water Agency proposes the development and operation of a groundwater bank on approximately 1,500 acres of land in the western edges of the Antelope Valley. The project would store State Water Project water supplies from the Agency and other banking partners during wet weather periods when supplies exceed demands and would recover the water for use by the Agency and its partners during dry weather years when demands exceed supplies and other times when there are disruptions to State Water Project Supplies.
Surrounding Land Uses and Setting;	The project area is primarily surrounded by open space on the west and north borders. To the east there is open space with sparse residential homes. The south border is an aqueduct separating the project site from agricultural land and a community of about 50 residential homes.
Other Public Agencies Whose Approval is Required (e.g. Permits, Financial Approval, or Participation Agreements):	Department of Water Resources. Regional Water Quality Control Board Los Angeles County Banking Partners

Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, has consultation begun?	Yes, the San Manuel Band of Mission Indians and the San Gabriel Band of Mission Indians have requested notification of projects by the Lead Agency. The Lead Agency has sent out letters to these tribal groups requesting initiation of consultation.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this Project. Please Refer to the project's Initial Study for additional details which determined the conclusions of the below noted findings.

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

DETERMINATION:

On the basis of this initial evaluation:

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

Signature:	**Date:**
Printed Name: **Dwayne Chisam, PE** **General Manager**	

CEQA Environmental Checklist

This checklist identifies physical, biological, social and economic factors that might be affected by the proposed Project. In many cases, background studies performed in connection with the Projects indicate no impacts. A NO IMPACT answer in the last column reflects this determination. Where there is a need for clarifying discussion, the discussion is included either following the applicable section of the checklist or is within the body of the environmental document itself. The words "significant" and "significance" used throughout the following checklist are related to CEQA impacts. The questions in this form are intended to encourage the thoughtful assessment of impacts and do not represent thresholds of significance.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
I. AESTHETICS: Would the Project:				
a) Have a substantial adverse effect on a scenic vista	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☐	☒
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐
II. AGRICULTURE AND FOREST RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the Project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☒	☐	☐
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	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?	☐	☐	☐	☒
III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the Project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or Projected air quality violation?	☐	☒	☐	☐
c) 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☒	☐	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☒	☐	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒
IV. BIOLOGICAL RESOURCES: Would the Project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☐	☐	☒
c) 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?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	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?	☐	☐	☐	☒
V. CULTURAL RESOURCES: Would the Project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☒	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐
VI. GEOLOGY AND SOILS: Would the Project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	☐	☒	☐	☐
ii) Strong seismic ground shaking?	☐	☒	☐	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☒	☐	☐
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☒	☐	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☒	☐	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

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

VIII. HAZARDS AND HAZARDOUS MATERIALS: Would the Project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☒	☐	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project result in a safety hazard for people residing or working in the Project area?	☐	☐	☐	☒
f) For a Project within the vicinity of a private airstrip, would the Project result in a safety hazard for people residing or working in the Project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

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IX. HYDROLOGY AND WATER QUALITY: Would the Project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☐	☒
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☒	☐	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	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, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☒	☐	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☒	☐	☐
e) 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?	☐	☐	☒	☐
f) Otherwise substantially degrade water quality?	☐	☐	☒	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☒	☐	☐
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☒	☐
j) Inundation by seiche, tsunami, or mudflow	☐	☐	☐	☒
X. LAND USE AND PLANNING: Would the Project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒
XI. MINERAL RESOURCES: Would the Project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

XII. NOISE: Would the Project result in:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☒	☐	☐
c) A substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project?	☐	☒	☐	☐
d) A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project?	☐	☒	☐	☐
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 expose people residing or working in the Project area to excessive noise levels?	☐	☐	☐	☒
f) For a Project within the vicinity of a private airstrip, would the Project expose people residing or working in the Project area to excessive noise levels?	☐	☐	☐	☒
XIII. POPULATION AND HOUSING: Would the Project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐
XIV. PUBLIC SERVICES:				
a) Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	☐	☐	☒	☐
Fire protection?	☐	☐	☒	☐
Police protection?	☐	☐	☒	☐
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

XV. RECREATION: Would the Project result in:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒
XVI. TRANSPORTATION/TRAFFIC: Would the Project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☐	☒
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the District congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?	☐	☐	☒	☐
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒
XVII. TRIBAL CULTURAL RESOURCES: Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☐	☒	☐
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☒	☐

XVIII. UTILITIES AND SERVICE SYSTEMS: Would the Project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the Project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) 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?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

XIV. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the Project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the Project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a Project are considerable when viewed in connection with the effects of past Projects, the effects of other current Projects, and the effects of probable future Projects)?	☐	☒	☐	☐
c) Does the Project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

Appendix C: Air Quality Technical Memorandum

Antelope Valley – East Kern Water Agency

High Desert Water Bank

AECOM – Air Quality Technical Memorandum

AECOM conducted an analysis of criteria air pollutant and greenhouse gas (GHG) impacts associated with the proposed High Desert Water Bank project in Antelope Valley, California (Project). This analysis was performed at the request of the Antelope Valley East - Kern Water Agency to support the Project's California Environmental Quality Act (CEQA) documentation.

Project Description

The 1,500-acre Project site is in Los Angeles County, bounded by Avenue A (Kern / Los Angeles County Line) on the north, 300th Street West on the west, 280th Street West on the East, and the California Aqueduct on the south.

Objectives and Methodology

The purpose of this air quality technical memorandum is to assess potential criteria pollutant, ozone precursors, and greenhouse gas (GHG) emissions that would result from construction and operation of the Project consistent with guidelines and methodologies from air quality agencies; specifically, the Antelope Valley Air Quality Management District (AVAQMD).

Consistent with CEQA requirements, this memorandum evaluates:

- Mass emissions of criteria air pollutants from both construction and operational emissions; and
- Mass emissions of GHG emissions from both construction and operational emissions.

To provide guidance for project analysis under CEQA, the AVAQMD has established recommended thresholds of significance, as shown in Tables 1 and 2 for criteria pollutants and Table 6 for GHGs (AVAQMD 2016). A project with emission rates below these thresholds is considered to have a less-than-significant effect on regional and local air quality throughout the AVAQMD.

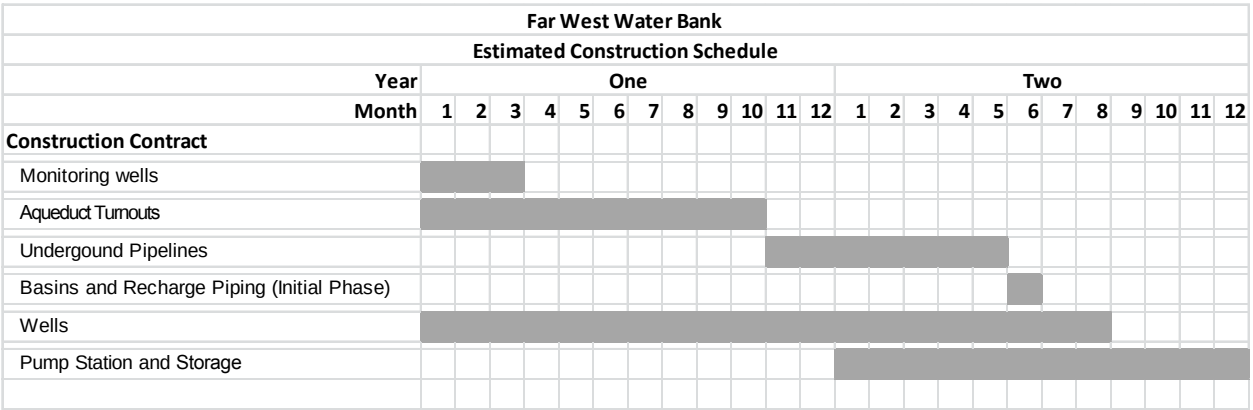
Estimation Methodology

Criteria pollutants and GHG emissions were estimated for construction and operation of the proposed Project using the methodology and assumptions discussed below.

Construction Emissions

Construction of the proposed Project would generate emissions associated with heavy-duty construction equipment; water and delivery trucks; and worker vehicles. AECOM calculated short-term construction criteria air pollutant and precursor emissions using spreadsheet calculations and emission factors from California Air Resources Board (ARB) OFFROAD and EMFAC 2014 inventory models (ARB 2015). Construction emissions from the operation of diesel-fueled off-road equipment were estimated by multiplying daily usage (i.e., hours per day) and total days of construction by OFFROAD equipment-specific factors. Emissions from on-road motor vehicles were estimated using vehicle trips, vehicle miles traveled, and EMFAC 2014 mobile source emission factors. The emission factors represent the fleet-wide average emission factors within the AVAQMD region. Fugitive dust emissions were estimated using the U.S. Environmental Protection Agency (EPA) Compilation of Air Pollutant Factors (AP-42) and are based on vehicle miles traveled, material loading, excavation, and stockpiling.

Construction would involve demolition of several structures, including one small residence; the amount of demolition was deemed negligible due to the overall project size. The remainder of the project consists primarily of drilling, earthmoving, and small construction projects (e.g. turnout installation [to withdraw water from the California Aqueduct], underground pipeline placement; pump metering/booster station and storage tank construction). The drilling would include installation of five monitoring wells and 18 extraction wells, and would both take place in parallel with other projects as shown via the construction schedule below.



Emissions were calculated using Project-specific equipment lists and construction schedules estimated by the AECOM project team. Spreadsheet calculations, including construction assumptions, are provided in Attachment A. The following primary construction assumptions were used to model construction-related air quality emissions:

- Construction Schedule: 24 months

- Areas to be Disturbed:
  - Monitoring Well (5) drilling: 40 x 40 foot drilling pad area per well
  - Extraction Well (18) drilling: 100 x 100 foot drilling pad area per well
  - Underground Pipeline installation: Excavation/trench of 6 to11 feet depth, 6 feet wide at bottom and up to 20 feet wide at surface (if not shored) with a daily disturbance of 400 feet per day. The daily work area would be approximately 500 feet long by 60 feet wide, although not all of this area would be disturbed continuously.
  - Recharge Basin construction: maximum 3-foot high earthen berms across 400 acres (initial) of the 1,500 acre site. Berms would be placed to take advantage of existing topography. The approach to berm construction for the proposed Project will not result in the substantial removal of top soils and will minimize the area of soils affected by this aspect of construction when compared to traditional engineered recharge basin construction. It is anticipated that earthen berms and recharge operations will eventually cover 1,200 acres of the site; however, these would be built at a slower pace than the initial 400 acres.
- Demolition: Assumed negligible, as discussed above;
- Cut/Fill Volumes: Net zero
- Maximum Daily Construction Workers: 30 workers per day (assumed during all phases)

Construction of the proposed Project is estimated to take approximately 24 months to complete with various activities occurring in an overlapping manner. Total construction emissions were calculated in pounds per day and tons per year. Eight-hour work days were assumed for all but the drilling phases (which are assumed to run 24 hours per day, seven days per week). Table 1 presents the proposed Project's maximum daily emissions during construction for criteria pollutants for four overlapping activity scenarios.

Operational Emissions

Operations would be limited to one-full-time worker performing berm maintenance to offset the effects of erosion, and to continuously add new earthen berms and recharge basins over the remaining 800 acres of the project site. Two additional employees would be responsible for performing above-ground pipe relocations for approximately five days every four months. Other than these activities, emissions would primarily be limited to indirect greenhouse gas (GHG) emissions associated with electricity provided by Southern California Edison (SCE). AECOM estimated the Project's daily and long-term operational air quality emissions from these activities.

Air Quality – Unmitigated Emissions Results

The following section presents estimates of the proposed Project's air quality construction and operational emissions.

Construction

As shown in Tables 1 and 2, the proposed Project's unmitigated annual and daily construction emissions would not exceed AVAQMD's thresholds of significance, except for daily nitrogen oxides (NOx) emissions. Spreadsheet calculations, including construction assumptions, are provided in Attachment A.

Table 1. Unmitigated Project Annual Construction Emissions

Construction Year/Phase	VOC (tons)	NO_X (tons)	CO (tons)	PM_{10} (tons)	$PM_{2.5}$ (tons)
Year1 / Activity 1: Monitoring Wells (Installation)	0.06	0.59	0.64	0.08	0.05
Year1 / Activity 2: Aqueduct Turnout, Construction	0.24	2.90	2.07	0.54	0.32
Year 1 / Activity 3: Underground Pipelines, Trenching	0.09	0.94	0.72	0.21	0.09
Year 1 / Activity 4: Recharge Basin, Grading, and Above-ground Pipeline, Installation	n/a	n/a	n/a	n/a	n/a
Year 1 / Activity 5: Extraction Wells, Installation	0.48	5.84	3.86	4.16	0.79
Year 1 / Activity 6: Booster Pump Station, Construction, and Water Storage, Construction	n/a	n/a	n/a	n/a	n/a
Year 1 TOTAL (tons)	0.87	10.27	7.28	5.00	1.25
Year 2 / Activity 1: Monitoring Wells (Installation)	n/a	n/a	n/a	n/a	n/a
Year 2 / Activity 2: Aqueduct Turnout, Construction	n/a	n/a	n/a	n/a	n/a
Year 2 / Activity 3: Underground Pipelines, Trenching	0.19	1.95	1.45	0.50	0.21
Year 2 / Activity 4: Recharge Basin, Grading, and Above-ground Pipeline, Installation	0.01	0.06	0.13	0.03	0.02
Year 2 / Activity 5: Extraction Wells, Installation	0.35	4.31	3.16	3.94	0.66
Year 2 / Activity 6: Booster Pump Station, Construction, and Water Storage, Construction	0.53	6.10	4.09	0.77	0.47
Year 2 TOTAL (tons)	1.08	12.41	8.83	5.24	1.36
MAXIMUM Annual Construction Emissions (tons)	1.08	12.41	8.83	5.24	1.36
AVAQMD Significance Threshold (tons)	25	25	100	15	12
Exceeds AVAQMD thresholds?	No	No	No	No	No

Note: For purposes of calculating emissions, construction was assumed to start in January 2018 (corresponds with Year 1). In the event that the Project begins at a later date, the estimated durations are assumed to remain the same and the analysis would remain conservative as the equipment and vehicle fleets used would be expected to improve with a later start (i.e. the fleet would consist of a newer and less polluting equipment/vehicles).

Table 2. Unmitigated Project Daily Construction Emissions

Construction Phase	VOC (lbs/day)	NO_X (lbs/day)	CO (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
Activity 1: Monitoring Wells (Installation)	2.77	32.14	25.46	2.15	1.57
Activity 2: Aqueduct Turnout, Construction	2.27	27.59	19.71	18.11	4.64
Activity 3: Underground Pipelines, Trenching	4.32	45.00	34.31	11.86	4.64
Activity 4: Recharge Basin, Grading, and Above-ground Pipeline, Installation	0.80	5.53	11.98	3.18	1.88
Activity 5: Extraction Wells, Installation	5.95	71.16	40.80	40.25	7.34
Activity 6: Booster Pump Station, Construction, and Water Storage, Construction	29.19	48.42	32.44	23.01	5.79
Subtotal of Activities 1,2,5 (overlap Year 1, months 1-3)	10.99	130.89	85.96	60.52	13.54
Subtotal of Activities 3,5 (overlap Year 1, months 11,12)	10.27	116.16	75.11	52.11	11.98
Subtotal of Activities 3,5,6 (overlap Year 2, months 1-5)	39.45	164.57	107.55	75.13	17.77
Subtotal of Activities 4,5,6 (overlap Year 2, months 6)	35.93	125.10	85.21	66.45	15.01
Maximum Daily Construction Emissions (lbs/day)	39.45	164.57	107.55	75.13	17.77
AVAQMD Significance Threshold (lbs/day)	137	137	548	82	65
Exceeds AVAQMD thresholds?	No	YES	No	No	No

Note: For purposes of calculating emissions, construction was assumed to start in January 2018 (corresponds with Year 1). In the event that the Project begins at a later date, the estimated durations are assumed to remain the same and the analysis would remain conservative as the equipment and vehicle fleets used would be expected to improve with a later start (i.e. the fleet would consist of a newer and less polluting equipment/vehicles).

Operations

Tables 3 and 4 present the proposed Project's annual and daily operational emissions from criteria pollutants, respectively.

Table 3. Project Annual Operational Emissions

Operational Emission Source	VOC	NO_X	CO	PM_{10}	$PM_{2.5}$
Total Operational Emissions (tons)	0.10	0.72	1.56	1.79	0.58
AVAQMD Significance Threshold (tons)	25	25	100	15	12
Exceeds AVAQMD thresholds?	No	No	No	No	No

Table 4. Project Daily Operational Emissions

Operational Emission Source	VOC (lbs/day)	NO_X (lbs/day)	CO (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
Total Construction Emissions (lbs/day)	0.80	5.53	11.98	7.01	3.95
AVAQMD Significance Threshold (lbs/day)	137	137	548	82	65
Exceeds AVAQMD thresholds?	No	No	No	No	No

Air Quality – Mitigated Emissions Results

As shown in the prior section, without mitigation, the Project would emit NOx in excess of the AVAQMD's quantitative daily thresholds.

Per AVAQMD's CEQA guidance document: "A significant project must incorporate mitigation sufficient to reduce its impact to a level that is not significant. A project that cannot be mitigated to a level that is not significant must incorporate all feasible mitigation." (AVAQMD 2016)

Since the project must comply with AVAQMD Rule 403 and will result in a Disturbed Surface Area greater than 5 acres and/or in the moving, depositing or relocating more than 2,500 cubic yards of Bulk Materials on at least three days (as detailed in Section [D][1] of the rule), the project will need to assemble and submit a Dust Control Plan (DCP) to the AVAQMD (AVAQMD 2017). The DCP must be reviewed and conditionally approved by the Air Pollution Control Officer (APCO). In addition, the project owner must provide written notice to the APCO at least 10 days prior to commencement of earth-moving activities.

As part of construction design features, berms will be constructed perpendicular to the prevailing wind (where possible), speed limits will be posted and enforced on unpaved roads, and disturbed areas will be watered down at a rate not less than every three hours during construction hours. To keep dust down, native plants will be allowed to propagate in and around the basins and berms. This vegetation will minimize dust potential, also during recharge operations, the soil will be wet. During non-recharge operations, the

conditions are no different than they are now (fallowed undeveloped land).Incorporation of Mitigation Measure AQ-1 would be required to reduce criteria pollutant emissions.

AQ-1 The construction contractor shall use off-road construction diesel engines that meet, at a minimum, the Tier 4 interim California Emissions Standards, unless such an engine is not available for a particular item of equipment. Tier 3 engines will be allowed on a case by case basis when the contractor has documented that no Tier 4 interim equipment, or emissions equivalent retrofit equipment, is available for a particular equipment type that must be used to complete construction. Documentation shall consist of signed written statements from at least two construction equipment rental firms.

Implementation of Mitigation Measure AQ-1 would ensure construction activities associated with the construction of the project would minimize criteria pollutant emissions. Mitigation Measure AQ-1 requires engines in diesel-fueled construction equipment above 50 horsepower to meet Tier 4 emission standards. Emission standards for diesel off-road equipment are based on the engine model year. Implementation of these standards, referred to as Tier 1 emission standards, became effective in 1996. The more stringent Tier 2 and Tier 3 emission standards became effective between 2001 and 2008, with the effective date dependent on engine horsepower. Tier 4 interim standard became effective between 2008 and 2012, and Tier 4 final standards became effective in 2014 and 2015. Table 5 presents the proposed Project's daily construction emissions of criteria pollutants with implementation of Mitigation Measure AQ-1. As shown in Table 5, the proposed Project's mitigated daily construction emissions would not exceed the AVAQMD's thresholds of significance.

Table 5. Mitigated Project Daily Construction Emissions

Construction Phase	VOC (lbs/day)	NO_X (lbs/day)	CO (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
Activity 1: Monitoring Wells (Installation)	1.89	24.82	46.70	1.47	0.95
Activity 2: Aqueduct Turnout, Construction	1.11	18.12	22.33	17.36	3.94
Activity 3: Underground Pipelines, Trenching	1.36	21.76	39.21	10.05	2.98
Activity 4: Recharge Basin, Grading, and Above-ground Pipeline, Installation	0.61	4.43	12.02	3.01	1.73
Activity 5: Extraction Wells, Installation	2.79	45.12	77.05	38.47	5.67
Activity 6: Booster Pump Station, Construction, and Water Storage, Construction	26.84	30.21	37.33	21.57	4.46

Subtotal of Activities 1,2,5 (overlap Year 1, months 1-3)	5.79	88.06	146.07	57.30	10.56
Subtotal of Activities 3,5 (overlapYear 1, months 11,12)	4.15	66.88	116.26	48.52	8.65
Subtotal of Activities 3,5,6 (overlapYear 2, months 1-5)	30.99	97.09	153.59	70.08	13.11
Subtotal of Activities 4,5,6 (overlapYear 2, months 6)	30.24	79.76	126.40	63.05	11.86
Maximum Daily Construction Emissions (lbs/day)	30.99	97.09	153.59	70.08	13.11
AVAQMD Significance Threshold (lbs/day)	137	137	548	82	65
Exceeds AVAQMD thresholds?	No	No	No	No	No

Note: For purposes of calculating emissions, construction was assumed to start in January 2018 (corresponds with Year 1). In the event that the Project begins at a later date, the estimated durations are assumed to remain the same and the analysis would remain conservative as the equipment and vehicle fleets used would be expected to improve with a later start (i.e. the fleet would consist of a newer and less polluting equipment/vehicles).

Greenhouse Gases - Introduction

Certain gases in the earth's atmosphere, classified as greenhouse gases (GHG), play a critical role in determining the earth's surface temperature. A portion of the solar radiation that enters earth's atmosphere is absorbed by the earth's surface, and a smaller portion of this radiation is reflected back toward space. Infrared radiation is absorbed by GHGs; as a result, infrared radiation released from the earth 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.

GHGs are present in the atmosphere naturally, are released by natural sources and anthropogenic sources, and are formed from secondary reactions taking place in the atmosphere. The following are GHGs that are widely accepted as the principal contributors to human-induced global climate change that are relevant to the proposed project:

- Carbon dioxide (CO_2)
- Methane (CH_4)
- Nitrous oxide (N_2O)

Emissions of CO_2 are byproducts of fossil fuel combustion. CH_4 is the main component of natural gas and is associated with agricultural practices and landfills. N_2O is a colorless GHG that results from industrial processes, vehicle emissions, and agricultural practices.

Global warming potential (GWP) is a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to CO_2. The GWP of a GHG is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and length of time (i.e., lifetime) that the gas remains in the atmosphere ("atmospheric lifetime"). The reference gas for GWP is CO_2; therefore, CO_2 has a GWP of 1. The other main GHGs that have been attributed to human activity include CH_4, which has a GWP of 28, and N_2O, which has a GWP of 265 (IPCC 2013). For example, 1 ton of CH_4 has the same contribution to the greenhouse effect as approximately 28 tons of CO_2. GHGs with lower emissions rates than CO_2 may still contribute to climate change, because they are more effective at absorbing outgoing infrared radiation than CO_2 (i.e., high GWP). The concept of CO_2-equivalents (CO_2e) is used to account for the different GWP potentials of GHGs to absorb infrared radiation.

Greenhouse Gas - Potential Impacts

During construction, direct emissions would be generated from worker and vendor vehicle trips, and off-road equipment. During operation, direct emissions would result from vehicle trips and area sources and indirect emissions would occur from project electrical demand. Construction and operational GHG emissions from the proposed GHG emissions were modeled using the same methods and assumptions as those described for criteria pollutants, except that the GHG emissions factors associated with indirect emissions were obtained from the Edison International's 2015 Corporate Responsibility Report (Edison 2015). Table 5 shows the estimated annual and daily GHG emissions. Spreadsheet calculations, including construction assumptions, are provided in Attachment A.

Table 5 Annual and Daily GHG Emission Estimates

Emission Source	Annual GHG Emission Estimate (tons CO_2e/yr)	Daily GHG Emissions Estimate (lbs/day)
Construction Emissions	5,308	37,601
Operational Emissions	14,766	74,535
AVAQMD Significance Threshold	100,000	548,000
Exceeds AVAQMD thresholds?	No	No

References

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Attachment A: Emissions Estimation Spreadsheets

AVEK HDWB
Construction Emissions Summary--MITIGATED

		Emissions (lbs/day)					Metric Tons	Emissions (tons/2018)					Metric Tons	Emissions (tons/2019)					Metric Tons
	Construction Phase/Emissions Source	**ROG**	**NO_X**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**	**ROG**	**NO_X**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**	**ROG**	**NO_X**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**
1	**Monitoring Wells (Installation)**																		
	Construction Equipment	1.27	18.98	36.96	0.16	0.16	3.14	0.01	0.21	0.42	0.00	0.00	71.06						
	On-Road Vehicles (workers, delivery, vendors)	0.62	5.85	9.74	0.72	0.46	1.69	0.03	0.26	0.44	0.03	0.02	0.08						
	Fugitive Dust, Paved & Unpaved Road Dust				0.59	0.32					0.04	0.02							
	Total Construction Emissions	**1.89**	**24.82**	**46.70**	**1.47**	**0.95**	**4.83**	**0.04**	**0.48**	**0.86**	**0.07**	**0.04**	**71.13**						
2	**Aqueduct Turnout, Construction**																		
	Construction Equipment	0.32	6.42	11.94	0.03	0.03	0.88	0.03	0.67	1.25	0.00	0.00	184.47						
	On-Road Vehicles (workers, delivery, vendors)	0.79	11.70	10.38	0.86	0.53	2.47	0.08	1.23	1.09	0.09	0.06	0.26						
	Fugitive Dust, Paved & Unpaved Road Dust				16.47	3.39					0.37	0.19							
	Total Construction Emissions	**1.11**	**18.12**	**22.33**	**17.36**	**3.94**	**3.35**	**0.12**	**1.90**	**2.34**	**0.46**	**0.25**	**184.73**						
3	**Underground Pipelines, Trenching**																		
	Construction Equipment	0.74	15.91	29.47	0.08	0.08	2.16	0.02	0.33	0.62	0.00	0.00	90.51	0.04	0.84	1.55	0.00	0.00	222.65
	On-Road Vehicles (workers, delivery, vendors)	0.62	5.85	9.74	0.72	0.46	1.69	0.01	0.12	0.20	0.02	0.01	0.04	0.01	0.12	0.20	0.02	0.01	248.65
	Fugitive Dust, Paved & Unpaved Road Dust				9.25	2.44					0.16	0.05					0.40	0.12	
	Total Construction Emissions	**1.36**	**21.76**	**39.21**	**10.05**	**2.98**	**3.85**	**0.03**	**0.46**	**0.82**	**0.18**	**0.06**	**90.55**	**0.05**	**0.96**	**1.75**	**0.42**	**0.13**	**471.30**
4	**Recharge Basin, Grading, and Above-ground Pipeline, Installation**																		
	Construction Equipment	0.08	1.51	2.61	0.01	0.01	0.16							0.00	0.02	0.03	0.00	0.00	3.29
	On-Road Vehicles (workers, delivery, vendors)	0.54	2.92	9.41	0.66	0.43	1.30							0.01	0.03	0.10	0.01	0.00	27.31
	Fugitive Dust, Paved & Unpaved Road Dust				2.35	1.29											0.02	0.01	
	Total Construction Emissions	**0.61**	**4.43**	**12.02**	**3.01**	**1.73**	**1.46**							**0.01**	**0.05**	**0.13**	**0.03**	**0.02**	**30.60**
5	**Extraction Wells, Installation**																		
	Construction Equipment	2.00	33.42	66.66	0.20	0.20	5.89	0.09	1.71	3.32	0.01	0.01	904.30	0.06	1.14	2.21	0.01	0.01	356.29
	On-Road Vehicles (workers, delivery, vendors)	0.79	11.70	10.38	0.86	0.53	2.47	0.14	2.11	1.87	0.15	0.09	0.45	0.14	2.11	1.87	0.15	0.09	1483.88
	Fugitive Dust, Paved & Unpaved Road Dust				37.41	4.94					3.86	0.56					3.69	0.48	
	Total Construction Emissions	**2.79**	**45.12**	**77.05**	**38.47**	**5.67**	**8.36**	**0.24**	**3.82**	**5.19**	**4.02**	**0.66**	**904.75**	**0.20**	**3.25**	**4.08**	**3.85**	**0.58**	**1840.17**
6	**Booster Pump Station, Construction, and Water Storage, Construction**																		
	Construction Equipment	1.00	15.59	26.63	0.16	0.16	1.98							0.13	1.96	3.35	0.02	0.02	500.06
	On-Road Vehicles (workers, delivery, vendors)	0.87	14.62	10.71	0.92	0.56	2.86							0.11	1.84	1.35	0.12	0.07	721.71
	Fugitive Dust, Paved & Unpaved Road Dust				20.49	3.74											0.45	0.21	
	Surface Coating (spray equip included above)	24.96												0.06					
	Total Construction Emissions	**26.84**	**30.21**	**37.33**	**21.57**	**4.46**	**4.85**							**0.24**	**3.81**	**4.70**	**0.58**	**0.30**	**1221.77**
Over-lapping Activity Groups **	Activities 1,2,5 (2018, Months 1-3)	5.79	88.06	146.07	57.30	10.56	16.54												
	Activities 3,5 (2018, Months 11,12)	4.15	66.88	116.26	48.52	8.65	12.21												
	Activities 3,5,6 (2019, Months 1-5)	30.99	97.09	153.59	70.08	13.11	17.06												
	Activities 4,5,6 (2019,Months 6)	30.24	79.76	126.40	63.05	11.86	14.67												
	Maximums	**30.99**	**97.09**	**153.59**	**70.08**	**13.11**		**Total**	**0.42**	**6.65**	**9.22**	**4.73**	**1.01**	**1251.16**	**0.50**	**8.06**	**10.66**	**4.89**	**1.04**	**3563.84**
	AVAPCD Significant Emissions Thresholds	137	137	548	82	65			25	25	100	15	12		25	25	100	15	12	
	Exceeds Significance Threshold?	No	No	No	No	No			No	No	No	No	No		No	No	No	No	No	

Construction GHG Emissions (MT CO_2e)	4,815
Construction GHG Emissions (tons CO_2e)	5,308

Maximum Daily GHG Emissions (MT CO_2e/day)	17
Maximum Daily GHG Emissions (lbs CO_2e/day)	37,601

** Since all overlapping activity groups include Activity 5, emissions associated with the maximum 30 employee roundtrips were calculated there.

AVEK HDWB
Construction Emissions Summary--UNMITIGATED

		Emissions (lbs/day)					Metric Tons	Emissions (tons/2018)					Metric Tons	Emissions (tons/2019)					Metric Tons
	Construction Phase/Emissions Source	**ROG**	**NO_X**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**	**ROG**	**NO_X**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**	**ROG**	**NO_X**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**
1	**Monitoring Wells (Installation)**																		
	Construction Equipment	2.14	26.29	15.72	0.84	0.78	3.14	0.03	0.33	0.20	0.01	0.01	71.06						
	On-Road Vehicles (workers, delivery, vendors)	0.62	5.85	9.74	0.72	0.46	1.69	0.03	0.26	0.44	0.03	0.02	0.08						
	Fugitive Dust, Paved & Unpaved Road Dust				0.59	0.32					0.04	0.02							
	Total Construction Emissions	**2.77**	**32.14**	**25.46**	**2.15**	**1.57**	**4.83**	**0.06**	**0.59**	**0.64**	**0.08**	**0.05**	**71.13**						
2	**Aqueduct Turnout, Construction**																		
	Construction Equipment	1.48	15.90	9.32	0.79	0.73	0.88	0.16	1.67	0.98	0.08	0.08	184.47						
	On-Road Vehicles (workers, delivery, vendors)	0.79	11.70	10.38	0.86	0.53	2.47	0.08	1.23	1.09	0.09	0.06	0.26						
	Fugitive Dust, Paved & Unpaved Road Dust				16.47	3.39					0.37	0.19							
	Total Construction Emissions	**2.27**	**27.59**	**19.71**	**18.11**	**4.64**	**3.35**	**0.24**	**2.90**	**2.07**	**0.54**	**0.32**	**184.73**						
3	**Underground Pipelines, Trenching**																		
	Construction Equipment	3.70	39.15	24.58	1.89	1.74	2.16	0.08	0.82	0.52	0.04	0.04	90.51	0.18	1.82	1.25	0.09	0.08	222.65
	On-Road Vehicles (workers, delivery, vendors)	0.62	5.85	9.74	0.72	0.46	1.69	0.01	0.12	0.20	0.02	0.01	0.04	0.01	0.12	0.20	0.02	0.01	248.65
	Fugitive Dust, Paved & Unpaved Road Dust				9.25	2.44					0.16	0.05					0.40	0.12	
	Total Construction Emissions	**4.32**	**45.00**	**34.31**	**11.86**	**4.64**	**3.85**	**0.09**	**0.94**	**0.72**	**0.21**	**0.09**	**90.55**	**0.19**	**1.95**	**1.45**	**0.50**	**0.21**	**471.30**
4	**Recharge Basin, Grading, and Above-ground Pipeline, Installation**																		
	Construction Equipment	0.26	2.60	2.56	0.17	0.16	0.16							0.00	0.03	0.03	0.00	0.00	3.29
	On-Road Vehicles (workers, delivery, vendors)	0.54	2.92	9.41	0.66	0.43	1.30							0.01	0.03	0.10	0.01	0.00	27.31
	Fugitive Dust, Paved & Unpaved Road Dust				2.35	1.29											0.02	0.01	
	Total Construction Emissions	**0.80**	**5.53**	**11.98**	**3.18**	**1.88**	**1.46**							**0.01**	**0.06**	**0.13**	**0.03**	**0.02**	**30.60**
5	**Extraction Wells, Installation**																		
	Construction Equipment	5.16	59.46	30.41	1.98	1.87	5.89	0.34	3.73	1.99	0.15	0.14	904.30	0.21	2.20	1.29	0.09	0.08	356.29
	On-Road Vehicles (workers, delivery, vendors)	0.79	11.70	10.38	0.86	0.53	2.47	0.14	2.11	1.87	0.15	0.09	0.45	0.14	2.11	1.87	0.15	0.09	1483.88
	Fugitive Dust, Paved & Unpaved Road Dust				37.41	4.94					3.86	0.56					3.69	0.48	
	Total Construction Emissions	**5.95**	**71.16**	**40.80**	**40.25**	**7.34**	**8.36**	**0.48**	**5.84**	**3.86**	**4.16**	**0.79**	**904.75**	**0.35**	**4.31**	**3.16**	**3.94**	**0.66**	**1840.17**
6	**Booster Pump Station, Construction, and Water Storage, Construction**																		
	Construction Equipment	3.35	33.80	21.73	1.61	1.49	1.98							0.42	4.26	2.74	0.20	0.19	500.06
	On-Road Vehicles (workers, delivery, vendors)	0.87	14.62	10.71	0.92	0.56	2.86							0.11	1.84	1.35	0.12	0.07	721.71
	Fugitive Dust, Paved & Unpaved Road Dust				20.49	3.74											0.45	0.21	
	Surface Coating (spray equip included above)	24.96												0.06					
	Total Construction Emissions	**29.19**	**48.42**	**32.44**	**23.01**	**5.79**	**4.85**							**0.53**	**6.10**	**4.09**	**0.77**	**0.47**	**1221.77**
Over-lapping Activity Groups **	Activities 1,2,5 (2018, Months 1-3)	10.99	130.89	85.96	60.52	13.54	16.54												
	Activities 3,5 (2018, Months 11,12)	10.27	116.16	75.11	52.11	11.98	12.21												
	Activities 3,5,6 (2019, Months 1-5)	39.45	164.57	107.55	75.13	17.77	17.06												
	Activities 4,5,6 (2019,Months 6)	35.93	125.10	85.21	66.45	15.01	14.67												
	Maximums	**39.45**	**164.57**	**107.55**	**75.13**	**17.77**		**Total**	**0.87**	**10.27**	**7.28**	**5.00**	**1.25**	**1251.16**	**1.08**	**12.41**	**8.83**	**5.24**	**1.36**	**3563.84**
	AVAPCD Significant Emissions Thresholds	137	**137**	548	82	65			25	25	100	15	12		25	25	100	15	12	
	Exceeds Significance Threshold?		**YES**	No	No	No			No	No	No	No	No		No	No	No	No	No	

Construction GHG Emissions (MT CO_2e)	4,815
Construction GHG Emissions (tons CO_2e)	5,308

Maximum Daily GHG Emissions (MT CO_2e/day)	17
Maximum Daily GHG Emissions (lbs CO_2e/day)	37,601

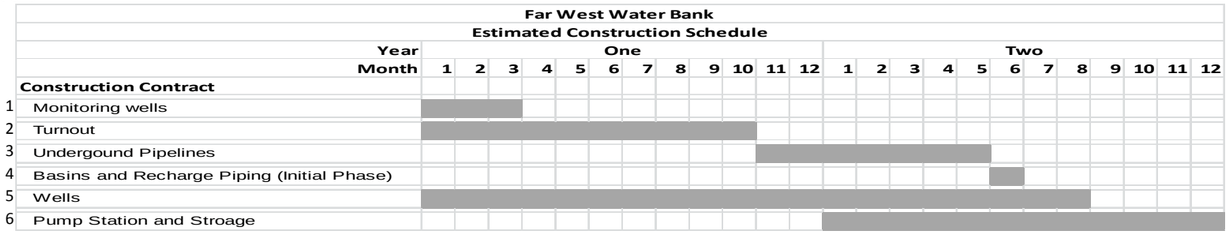
** Since all overlapping activity groups include Activity 5, emissions associated with the maximum 30 employee roundtrips were calculated there.

AVEK HDWB
Operational Emissions Summary--UNMITIGATED

		Emissions (lbs/day)					Metric Tons	Annual Emissions (tons/year)					Metric Tons
	Operations/Emissions Source	**ROG**	**NO_X**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**	**ROG**	**NO_X**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**
1													
2													
3													
4	**Recharge Basin, Grading, and Above-ground Pipeline, Installation**												
	Construction Equipment	0.26	2.60	2.56	0.17	0.16	0.16	0.03	0.34	0.33	0.02	0.02	40.74
	On-Road Vehicles (workers)	0.54	2.92	9.41	0.66	0.43	1.30	0.07	0.38	1.22	0.09	0.06	338.18
	Fugitive Dust, Paved & Unpaved Road Dust				6.18	3.36					1.68	0.51	
	Total Construction Emissions	**0.80**	**5.53**	**11.98**	**7.01**	**3.95**	**1.46**	**0.10**	**0.72**	**1.56**	**1.79**	**0.58**	**378.92**
5													
6													
	Total	**0.80**	**5.53**	**11.98**	**7.01**	**3.95**	**1.46**	**0.10**	**0.72**	**1.56**	**1.79**	**0.58**	**379**
	AVAPCD Significant Emissions Thresholds	137	137	548	82	65		25	25	100	15	12	100,000

	direct	indirect	TOTAL	AVAQMD Significance Thresholds	Exceeds Significance Threshold?
Opertational GHG Emissions (MT CO_2e)	379	13,016			
Operational GHG Emissions (tons CO_2e)	418	14,348	14,766	100,000	No
Maximum Daily GHG Emissions (MT CO_2e/day)	1	--			
Maximum Daily GHG Emissions (lbs CO_2e/day)	3,213	71,322	74,535	548,000	No

AVEK HDWB
Assumptions



Construction Phases	Start Date (assumed)	Workers	Duration (months)	Work days/wk (worst case)
1. Monitoring Wells (Installation)	1-Jan-18	30	3	7
2. Aqueduct Turnout, Construction	1-Jan-18	30	10	5
3. Underground Pipelines, Trenching	1-Nov-18	30	7	5
4. Recharge Basin, Grading, and Above-ground Pipeline, Installation	1-Jun-19	30	1	5
5. Extraction Wells, Installation	1-Jan-18	30	20	7
6. Booster Pump Station, Construction, and Water Storage, Construction	1-Jan-19	30	12	5

Notes

5 monitoring wells
2 acre disturbed construction area.
400 ft excavation (stockpiling)/day spread excess soil
Used Heavy Construction PM emission factors.
18 extraction wells Text mentions wet drilling spoil, so assume negligible emissions due to wet drilling method.

CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY
AVEK HDWB

	Primary Equipment Description	Estimated Horse-Power	Probable Fuel Type	Primary Equipment Quantity	Estimated Workforce	Estimated Schedule (Days)	Duration of Use (Hrs/Day, unless otherwise noted at right)	
1.	**Monitoring Wells (Installation)**				**30**	**90**		
	drilling rig	500	diesel	1		20	24	**/day/20 days**
	small roller compactor	114	diesel	1		90	1	
	skip loader	88	diesel	1		90	1	
	wheeled loader	313	diesel	1		90	1	
	water truck	200	diesel	1		90	1	
	Test pump	10	gas	1		5	12	**/well**
2.	**Aqueduct Turnout, Construction**				**30**	**210**		
	crane	190	diesel	1		210	6	
	hydraulic excavator	180	diesel	1		210	6	
	backhoe	108	diesel	1		210	5	
	roller compactor	114	diesel	1		210	4	
	wheeled loader	165	diesel	1		210	6	
	water truck	200	diesel	1		210	4	
3.	**Underground Pipelines, Trenching**				**30**	**147**		
	crane	190	diesel	1		147	2	
	hydraulic excavator	180	diesel	1		147	6	
	grader	174	diesel	1		147	6	
	off-highway truck	479	diesel	1		147	4	
	water trucks	200	diesel	2		147	4	
	belly scraper	313	diesel	1		147	4	
	wheeled loaders	165	diesel	2		147	8	
	skip loader	88	diesel	1		147	3	
	backhoes	108	diesel	2		147	5	
4.	**Recharge Basin, Grading, and Above-ground Pipeline, Installation**				**30**	**21**		
	backhoes	108	diesel	1		21	8	

5. **Extraction Wells, Installation**				**30**	**600**		
drilling rig	500	diesel	1		90	24	**/day/90 days**
hydraulic excavator	180	diesel	1		600	6	
grader	174	diesel	1		600	6	
off-highway truck	479	diesel	1		600	4	
small roller compactor	114	diesel	1		600	1	
skip loader	88	diesel	1		600	1	
wheeled loader	313	diesel	1		600	1	
water truck	200	diesel	1		600	1	
Test pump	200	diesel	1		45	60	**/well**
6. **Booster Pump Station, Construction, and Water Storage, Construction**				**30**	**252**		
crane	190	diesel	1		252	6	
hydraulic excavator	180	diesel	1		252	6	
grader	174	diesel	1		252	6	
off-highway truck	479	diesel	1		252	4	
water truck	200	diesel	1		252	4	
belly scraper	313	diesel	1		252	4	
wheeled loader	165	diesel	1		252	8	
roller	114	diesel	1		252	3	
backhoes	108	diesel	2		252	5	
skip loader	88	diesel	1		252	1	
Welder	25	diesel	1		252	8	
Air compressor (for sandblasting/coating)	25	diesel	1		252	8	

Deliveries

	Number of Deliveries	Frequency	Duration	Number trips (total)	
Pipe	2	per day	90 days	180	3. Underground Pipelines, Trenching
Extraction wells casing and components	2	every two weeks	32 weeks	64	5. Extraction Wells, Installation
Extraction Wells Well Equipping	4	every two weeks	32 weeks	128	5. Extraction Wells, Installation
Monitoring wells casing and materials	2	per week	5 weeks	10	1. Monitoring Wells (Installation)
Turnout concrete	6	total from Mojave		6	2. Aqueduct Turnout, Construction
Turnout Bock	1	rom Mojave		1	2. Aqueduct Turnout, Construction
Turnout Equipment	3	from Bakersfield.		3	2. Aqueduct Turnout, Construction
Turnout steel and components	2	total from Bakersfield		2	2. Aqueduct Turnout, Construction
Pump station concrete	8	total from Mojave		8	6. Booster Pump Station, Construction, and Water Storage, Construction
Pump Station Block	2	from Mojave.		2	6. Booster Pump Station, Construction, and Water Storage, Construction
Pump station steel and components	4	total from Bakersfield		4	6. Booster Pump Station, Construction, and Water Storage, Construction
Pump Station Equipment	8	from Bakersfield total.		8	6. Booster Pump Station, Construction, and Water Storage, Construction
Storage tank foundation materials	8	total from Mojave		8	6. Booster Pump Station, Construction, and Water Storage, Construction
Storage tank components	6	total from Santa Fe Springs		6	6. Booster Pump Station, Construction, and Water Storage, Construction

Power Demand

Each extraction well will have a power use range of 0 to 2,720,000 kW-hrs per year. The booster station will have a power use range of 0 to 2,380,000 kW-hrs per year. During dry years, recharge operations, the power usage will be zero. During wet years, recovery operations, wells and pump station may be running continuously. Please note that through the life of the project there will be more dry years than wet years.

Extraction Well	low	0	kW-hrs per year per well
	high	2,720,000	kilowatt hours (kWh) per year per well
		18	wells
Booster Station	low	0	kW-hrs per year per station
	high	2,380,000	kWh per year per station
		1	station

AVEK HDWB
Off-Road Construction Emissions, Daily and Annual--MITIGATED

Construction Year

	2018									Emissions Factors (g/bhp-hr)						Emissions (lbs/day)					MT/day	MT Per Phase	Construction Emissions (tons/2018)					MT
	Construction Phase/Equipment		Number	Usage Factor (hrs/day)	Total Hours/Day (Number * Usage Factor)	Total Days	Horsepower	Lookup Row	Load Factor	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	CO_2e	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	CO_2e	CO_2e	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	CO_2e
1	**Monitoring Wells (Installation)**															***1.27***	***18.98***	***36.96***	***0.16***	***0.16***	***3.14***	***71.06***	***0.01***	***0.21***	***0.42***	***0.00***	***0.00***	***71.06***
	drilling rig	Bore/Drill Rigs	1	24	24	20	500	430	0.50	0.08	1.29	2.60	0.01	0.01	489.92	1.06	17.15	34.56	0.11	0.11	2.95	59.08	0.01	0.17	0.35	0.00	0.00	59.08
	small roller compactor	Rollers	1	1	1	90	114	3092	0.38	0.11	2.14	3.70	0.01	0.01	496.50	0.01	0.20	0.35	0.00	0.00	0.02	1.91	0.00	0.01	0.02	0.00	0.00	1.91
	skip loader	Skid Steer Loaders	1	1	1	90	88	3818	0.37	0.11	2.14	3.70	0.01	0.01	494.37	0.01	0.15	0.26	0.00	0.00	0.02	1.44	0.00	0.01	0.01	0.00	0.00	1.44
	wheeled loader	Rubber Tired Loaders	1	1	1	90	313	3477	0.36	0.08	1.29	2.60	0.01	0.01	488.80	0.02	0.32	0.65	0.00	0.00	0.06	4.98	0.00	0.01	0.03	0.00	0.00	4.98
	water truck	Off-Highway Trucks	1	1	1	90	200	1904	0.38	0.08	1.29	2.60	0.01	0.01	491.89	0.01	0.22	0.44	0.00	0.00	0.04	3.38	0.00	0.01	0.02	0.00	0.00	3.38
	Test pump	Pumps	1	12	12	5	10	2916	0.74	0.77	4.76	3.58	0.26	0.26	570.23	0.15	0.93	0.70	0.05	0.05	0.05	0.25	0.00	0.00	0.00	0.00	0.00	0.25
2	**Aqueduct Turnout, Construction**															***0.32***	***6.42***	***11.94***	***0.03***	***0.03***	***0.88***	***184.47***	***0.03***	***0.67***	***1.25***	***0.00***	***0.00***	***184.47***
	crane	Cranes	1	6	6	210	190	738	0.29	0.08	1.29	2.60	0.01	0.01	495.69	0.06	0.93	1.88	0.01	0.01	0.16	34.19	0.01	0.10	0.20	0.00	0.00	34.19
	hydraulic excavator	Excavators	1	6	6	210	180	1222	0.38	0.08	1.29	2.60	0.01	0.01	494.53	0.07	1.17	2.36	0.01	0.01	0.20	42.83	0.01	0.12	0.25	0.00	0.00	42.83
	backhoe	Tractors/Loaders/Backhoes	1	5	5	210	108	4192	0.37	0.11	2.14	3.70	0.01	0.01	498.43	0.05	0.94	1.63	0.00	0.00	0.10	20.91	0.01	0.10	0.17	0.00	0.00	20.91
	roller compactor	Rollers	1	4	4	210	114	3092	0.38	0.11	2.14	3.70	0.01	0.01	496.50	0.04	0.81	1.40	0.00	0.00	0.08	17.84	0.00	0.08	0.15	0.00	0.00	17.84
	wheeled loader	Rubber Tired Loaders	1	6	6	210	165	3477	0.36	0.06	2.15	3.70	0.01	0.01	493.78	0.05	1.70	2.92	0.01	0.01	0.18	37.14	0.00	0.18	0.31	0.00	0.00	37.14
	water truck	Off-Highway Trucks	1	4	4	210	200	1904	0.38	0.08	1.29	2.60	0.01	0.01	491.89	0.05	0.87	1.75	0.01	0.01	0.15	31.56	0.01	0.09	0.18	0.00	0.00	31.56
3	**Underground Pipelines, Trenching**															***0.74***	***15.91***	***29.47***	***0.08***	***0.08***	***2.16***	***316.79***	***0.02***	***0.33***	***0.62***	***0.00***	***0.00***	***90.51***
	crane	Cranes	1	2	2	147	190	738	0.29	0.08	1.29	2.60	0.01	0.01	495.69	0.02	0.31	0.63	0.00	0.00	0.05	7.98	0.00	0.01	0.01	0.00	0.00	2.28
	hydraulic excavator	Excavators	1	6	6	147	180	1222	0.38	0.08	1.29	2.60	0.01	0.01	494.53	0.07	1.17	2.36	0.01	0.01	0.20	29.98	0.00	0.02	0.05	0.00	0.00	8.57
	grader	Graders	1	6	6	147	174	1673	0.41	0.06	2.15	3.70	0.01	0.01	501.71	0.06	2.02	3.48	0.01	0.01	0.21	31.47	0.00	0.04	0.07	0.00	0.00	8.99
	off-highway truck	Off-Highway Trucks	1	4	4	147	479	1904	0.38	0.08	1.29	2.60	0.01	0.01	497.81	0.13	2.08	4.19	0.01	0.01	0.36	53.55	0.00	0.04	0.09	0.00	0.00	15.30
	water trucks	Off-Highway Trucks	2	4	8	147	200	1904	0.38	0.08	1.29	2.60	0.01	0.01	491.89	0.11	1.74	3.50	0.01	0.01	0.30	44.18	0.00	0.04	0.07	0.00	0.00	12.62
	belly scraper	Scrapers	1	4	4	147	313	3620	0.48	0.08	1.29	2.60	0.01	0.01	495.05	0.11	1.72	3.46	0.01	0.01	0.30	43.95	0.00	0.04	0.07	0.00	0.00	12.56
	wheeled loaders	Rubber Tired Loaders	2	8	16	147	165	3477	0.36	0.06	2.15	3.70	0.01	0.01	493.78	0.13	4.53	7.79	0.02	0.02	0.47	69.33	0.00	0.10	0.16	0.00	0.00	19.81
	skip loader	Skid Steer Loaders	1	3	3	147	88	3818	0.37	0.11	2.14	3.70	0.01	0.01	494.37	0.02	0.46	0.79	0.00	0.00	0.05	7.07	0.00	0.01	0.02	0.00	0.00	2.02
	backhoes	Tractors/Loaders/Backhoes	2	5	10	147	108	4192	0.37	0.11	2.14	3.70	0.01	0.01	498.43	0.10	1.89	3.26	0.01	0.01	0.20	29.28	0.00	0.04	0.07	0.00	0.00	8.37
4	**Recharge Basin, Grading, and Above-ground Pipeline, Installation**															***0.08***	***1.51***	***2.61***	***0.01***	***0.01***	***0.16***	***3.35***						
	backhoes	Tractors/Loaders/Backhoes	1	8	8	21	108	4192	0.37	0.11	2.14	3.70	0.01	0.01	498.43	0.08	1.51	2.61	0.01	0.01	0.16	3.35						
5	**Extraction Wells, Installation**															***2.00***	***33.42***	***66.66***	***0.20***	***0.20***	***5.89***	***904.30***	***0.09***	***1.71***	***3.32***	***0.01***	***0.01***	***904.30***
	drilling rig	Bore/Drill Rigs	1	24	24	90	500	430	0.50	0.08	1.29	2.60	0.01	0.01	489.92	1.06	17.15	34.56	0.11	0.11	2.95	265.88	0.03	0.46	0.93	0.00	0.00	265.88
	hydraulic excavator	Excavators	1	6	6	600	180	1222	0.38	0.08	1.29	2.60	0.01	0.01	494.53	0.07	1.17	2.36	0.01	0.01	0.20	122.38	0.01	0.21	0.43	0.00	0.00	122.38
	grader	Graders	1	6	6	600	174	1673	0.41	0.06	2.15	3.70	0.01	0.01	501.71	0.06	2.02	3.48	0.01	0.01	0.21	128.44	0.01	0.36	0.63	0.00	0.00	128.44
	off-highway truck	Off-Highway Trucks	1	4	4	600	479	1904	0.38	0.08	1.29	2.60	0.01	0.01	497.81	0.13	2.08	4.19	0.01	0.01	0.36	218.55	0.02	0.37	0.75	0.00	0.00	218.55
	small roller compactor	Rollers	1	1	1	600	114	3092	0.38	0.11	2.14	3.70	0.01	0.01	496.50	0.01	0.20	0.35	0.00	0.00	0.02	12.74	0.00	0.04	0.06	0.00	0.00	12.74
	skip loader	Skid Steer Loaders	1	1	1	600	88	3818	0.37	0.11	2.14	3.70	0.01	0.01	494.37	0.01	0.15	0.26	0.00	0.00	0.02	9.62	0.00	0.03	0.05	0.00	0.00	9.62
	wheeled loader	Rubber Tired Loaders	1	1	1	600	313	3477	0.36	0.08	1.29	2.60	0.01	0.01	488.80	0.02	0.32	0.65	0.00	0.00	0.06	33.21	0.00	0.06	0.12	0.00	0.00	33.21
	water truck	Off-Highway Trucks	1	1	1	600	200	1904	0.38	0.08	1.29	2.60	0.01	0.01	491.89	0.01	0.22	0.44	0.00	0.00	0.04	22.54	0.00	0.04	0.08	0.00	0.00	22.54
	Test pump	Pumps	1	24	24	45	200	2916	0.74	0.08	1.29	2.60	0.01	0.01	568.89	0.63	10.10	20.36	0.06	0.06	2.02	90.93	0.01	0.14	0.27	0.00	0.00	90.93
6	**Booster Pump Station, Construction, and Water Storage, Construction**															***0.68***	***13.70***	***25.60***	***0.07***	***0.07***	***1.91***	***481.09***						
	crane	Cranes	1	6	6	252	190	738	0.29	0.08	1.29	2.60	0.01	0.01	495.69	0.06	0.93	1.88	0.01	0.01	0.16	41.03						
	hydraulic excavator	Excavators	1	6	6	252	180	1222	0.38	0.08	1.29	2.60	0.01	0.01	494.53	0.07	1.17	2.36	0.01	0.01	0.20	51.40						
	grader	Graders	1	6	6	252	174	1673	0.41	0.06	2.15	3.70	0.01	0.01	501.71	0.06	2.02	3.48	0.01	0.01	0.21	53.95						
	off-highway truck	Off-Highway Trucks	1	4	4	252	479	1904	0.38	0.08	1.29	2.60	0.01	0.01	497.81	0.13	2.08	4.19	0.01	0.01	0.36	91.79						
	water truck	Off-Highway Trucks	1	4	4	252	200	1904	0.38	0.08	1.29	2.60	0.01	0.01	491.89	0.05	0.87	1.75	0.01	0.01	0.15	37.87						
	belly scraper	Scrapers	1	4	4	252	313	3620	0.48	0.08	1.29	2.60	0.01	0.01	495.05	0.11	1.72	3.46	0.01	0.01	0.30	75.35						
	wheeled loader	Rubber Tired Loaders	1	8	8	252	165	3477	0.36	0.06	2.15	3.70	0.01	0.01	493.78	0.06	2.26	3.90	0.01	0.01	0.24	59.43						
	roller	Rollers	1	3	3	252	114	3092	0.38	0.11	2.14	3.70	0.01	0.01	496.50	0.03	0.61	1.05	0.00	0.00	0.06	16.05						
	backhoes	*Tractors/Loaders/Backhoes*	2	5	10	252	108	4192	0.37	0.11	2.14	3.70	0.01	0.01	498.43	0.10	1.89	3.26	0.01	0.01	0.20	50.19						
	skip loader	Skid Steer Loaders	1	1	1	252	88	3818	0.37	0.11	2.14	3.70	0.01	0.01	494.37	0.01	0.15	0.26	0.00	0.00	0.02	4.04						
	Welder	Welders	1	8	8	252	25	4522	0.45	0.81	4.66	2.53	0.23	0.23	570.32	0.16	0.92	0.50	0.05	0.05	0.05	12.93						
	Air compressor (for sandblasting/coating)	Air Compressors	1	8	8	252	25	232	0.48	0.81	4.66	2.53	0.23	0.23	570.32	0.17	0.99	0.54	0.05	0.05	0.05	13.80						
	2018 SUM OF ACTIVITIES (OFF-ROAD EXHAUST)																				***2018 SUM OF ACTIVITIES (OFF-ROAD EXHAUST), tpy***		0.16	2.93	5.62	0.02	0.02	1250.34
	1,2,5 Months 1-3															*3.59*	*58.82*	*115.57*	*0.39*	*0.39*	*9.90*	*1159.83*						
	or 3,5 Months 11,12															*2.74*	*49.34*	*96.14*	*0.28*	*0.28*	*8.04*	*1221.09*						

AVEK HDWB

On-Road Construction Emissions, Daily and Annual--MITIGATED

						Emissions Factors (g/mi)						Emissions (lb/day)					MT/day	MT/phase	Emissions (tons/2018)					MT
	Project Component/On-Road Vehicles	Days	Trips/Day	Trip Distance (one-way)	Daily VMT	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	CO_2e	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	CO_2e	CO_2e	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	CO_2e
1	**Monitoring Wells (Installation)**											***0.62***	***5.85***	***9.74***	***0.72***	***0.46***	***1.69***	***152.23***	***0.03***	***0.26***	***0.44***	***0.03***	***0.02***	***0.08***
	worker vehicles	90	60	60	3,600	0.07	0.36	1.19	0.08	0.05	359.94	0.54	2.89	9.41	0.66	0.43	1.30	116.62	0.02	0.13	0.42	0.03	0.02	0.06
	delivery vehicles	90	4	60	240	0.16	5.53	0.61	0.12	0.06	1,628.40	0.08	2.92	0.32	0.07	0.03	0.39	35.17	0.00	0.13	0.01	0.00	0.00	0.02
	water truck	90	2	1.5	3	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.04	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00
2	**Aqueduct Turnout, Construction**											***0.79***	***11.70***	***10.38***	***0.86***	***0.53***	***2.47***	***519.36***	***0.08***	***1.23***	***1.09***	***0.09***	***0.06***	***0.26***
	worker vehicles	210	60	60	3,600	0.07	0.36	1.19	0.08	0.05	359.94	0.54	2.89	9.41	0.66	0.43	1.30	272.12	0.06	0.30	0.99	0.07	0.05	0.14
	delivery vehicles	210	12	60	720	0.16	5.53	0.61	0.12	0.06	1,628.40	0.25	8.77	0.97	0.20	0.10	1.17	246.21	0.03	0.92	0.10	0.02	0.01	0.12
	water truck	210	2	1.5	3	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.04	0.00	0.00	0.00	0.00	1.03	0.00	0.00	0.00	0.00	0.00	0.00
3	**Underground Pipelines, Trenching**											***0.62***	***5.85***	***9.74***	***0.72***	***0.46***	***1.69***	***248.65***	***0.01***	***0.12***	***0.20***	***0.02***	***0.01***	***0.04***
	worker vehicles	147	60	60	3,600	0.07	0.36	1.19	0.08	0.05	359.94	0.54	2.89	9.41	0.66	0.43	1.30	190.48	0.01	0.06	0.20	0.01	0.01	0.03
	delivery vehicles	147	4	60	240	0.16	5.53	0.61	0.12	0.06	1,628.40	0.08	2.92	0.32	0.07	0.03	0.39	57.45	0.00	0.06	0.01	0.00	0.00	0.01
	water truck	147	2	1.5	3	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.04	0.00	0.00	0.00	0.00	0.72	0.00	0.00	0.00	0.00	0.00	0.00
4	**Recharge Basin, Grading, and Above-ground Pipeline, Installation**											***0.54***	***2.92***	***9.41***	***0.66***	***0.43***	***1.30***	***27.31***						
	worker vehicles	21	60	60	3,600	0.07	0.36	1.19	0.08	0.05	359.94	0.54	2.89	9.41	0.66	0.43	1.30	27.21						
	delivery vehicles	21	0	60	-	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
	water truck	21	2	1.5	3	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.04	0.00	0.00	0.00	0.00	0.10						
5	**Extraction Wells, Installation**											***0.79***	***11.70***	***10.38***	***0.86***	***0.53***	***2.47***	***1483.88***	***0.14***	***2.11***	***1.87***	***0.15***	***0.09***	***0.45***
	worker vehicles	600	60	60	3,600	0.07	0.36	1.19	0.08	0.05	359.94	0.54	2.89	9.41	0.66	0.43	1.30	777.48	0.10	0.52	1.69	0.12	0.08	0.23
	delivery vehicles	600	12	60	720	0.16	5.53	0.61	0.12	0.06	1,628.40	0.25	8.77	0.97	0.20	0.10	1.17	703.47	0.05	1.58	0.17	0.04	0.02	0.21
	water truck	600	2	1.5	3	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.04	0.00	0.00	0.00	0.00	2.93	0.00	0.01	0.00	0.00	0.00	0.00
6	**Booster Pump Station, Construction, and Water Storage, Construction**											***0.87***	***14.62***	***10.71***	***0.92***	***0.56***	***2.86***	***721.71***						
	worker vehicles	252	60	60	3,600	0.07	0.36	1.19	0.08	0.05	359.94	0.54	2.89	9.41	0.66	0.43	1.30	326.54						
	delivery vehicles	252	16	60	960	0.16	5.53	0.61	0.12	0.06	1,628.40	0.34	11.70	1.29	0.26	0.13	1.56	393.94						
	water truck	252	2	1.5	3	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.04	0.00	0.00	0.00	0.00	1.23						
	2018 SUM OF ACTIVITIES (ON-ROAD EXHAUST)																	***2018 SUM OF ACTIVITIES (ON-ROAD EXHAUST), tpy***	0.27	3.72	3.60	0.29	0.18	0.82
	1,2,5 Months 1-3											*2.20*	*29.24*	*30.50*	*2.44*	*1.52*	*6.64*	*2155.47*						
	or 3,5 Months 11,12											*1.41*	*17.54*	*20.12*	*1.58*	*0.99*	*4.16*	*1732.53*						
	2018 SUM OF ACTIVITIES (OFF- AND ON-ROAD EXHAUST)											***5.79***	***88.06***	***146.07***	***2.83***	***1.91***	***16.54***	***3315.31 HAUST), tpy***	0.42	6.65	9.22	0.31	0.20	1251.16

AVEK HDWB
Off-Road Construction Emissions, Daily and Annual--MITIGATED, plus Operations

Construction Year

	2019									Emissions Factors (g/bhp-hr)						Emissions (lbs/day)					MT/day	MT Per Phase	Construction Emissions (tons/2019)					MT	Annual Operational Emissions (tons/year)					MT
	Construction Phase/Equipment		Number	Usage Factor (hrs/day)	Total Hours/Day (Number * Usage Factor)	Total Days	Horsepower	Lookup Row	Load Factor	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	CO_2e	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	CO_2e	CO_2e	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	CO_2e	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	CO_2e
1	**Monitoring Wells (Installation)**															***1.26***	***18.95***	***36.96***	***0.16***	***0.16***	***3.08***	***69.83***												
	drilling rig	Bore/Drill Rigs	1	24	24	20	500	439	0.50	0.08	1.29	2.60	0.01	0.01	481.27	1.06	17.15	34.56	0.11	0.11	2.90	58.04												
	small roller compactor	Rollers	1	1	1	90	114	3099	0.38	0.11	2.14	3.70	0.01	0.01	488.63	0.01	0.20	0.35	0.00	0.00	0.02	1.88												
	skip loader	Skid Steer Loaders	1	1	1	90	88	3821	0.37	0.11	2.14	3.70	0.01	0.01	486.66	0.01	0.15	0.26	0.00	0.00	0.02	1.42												
	wheeled loader	Rubber Tired Loaders	1	1	1	90	313	3485	0.36	0.08	1.29	2.60	0.01	0.01	481.27	0.02	0.32	0.65	0.00	0.00	0.05	4.91												
	water truck	Off-Highway Trucks	1	1	1	90	200	1909	0.38	0.08	1.29	2.60	0.01	0.01	484.42	0.01	0.22	0.44	0.00	0.00	0.04	3.33												
	Test pump	Pumps	1	12	12	5	10	2925	0.74	0.75	4.65	3.56	0.24	0.24	570.18	0.15	0.91	0.70	0.05	0.05	0.05	0.25												
2	**Aqueduct Turnout, Construction**															***0.32***	***6.42***	***11.94***	***0.03***	***0.03***	***0.86***	***181.54***												
	crane	Cranes	1	6	6	210	190	745	0.29	0.08	1.29	2.60	0.01	0.01	487.75	0.06	0.93	1.88	0.01	0.01	0.16	33.64												
	hydraulic excavator	Excavators	1	6	6	210	180	1229	0.38	0.08	1.29	2.60	0.01	0.01	486.52	0.07	1.17	2.36	0.01	0.01	0.20	42.14												
	backhoe	Tractors/Loaders/Backhoes	1	5	5	210	108	4199	0.37	0.11	2.14	3.70	0.01	0.01	490.16	0.05	0.94	1.63	0.00	0.00	0.10	20.57												
	roller compactor	Rollers	1	4	4	210	114	3099	0.38	0.11	2.14	3.70	0.01	0.01	488.63	0.04	0.81	1.40	0.00	0.00	0.08	17.56												
	wheeled loader	Rubber Tired Loaders	1	6	6	210	165	3485	0.36	0.06	2.15	3.70	0.01	0.01	486.00	0.05	1.70	2.92	0.01	0.01	0.17	36.56												
	water truck	Off-Highway Trucks	1	4	4	210	200	1909	0.38	0.08	1.29	2.60	0.01	0.01	484.42	0.05	0.87	1.75	0.01	0.01	0.15	31.08												
3	**Underground Pipelines, Trenching**															***0.74***	***15.91***	***29.47***	***0.08***	***0.08***	***2.12***	***311.71***	***0.04***	***0.84***	***1.55***	***0.00***	***0.00***	***222.65***						
	crane	Cranes	1	2	2	147	190	745	0.29	0.08	1.29	2.60	0.01	0.01	487.75	0.02	0.31	0.63	0.00	0.00	0.05	7.85	0.00	0.02	0.03	0.00	0.00	5.61						
	hydraulic excavator	Excavators	1	6	6	147	180	1229	0.38	0.08	1.29	2.60	0.01	0.01	486.52	0.07	1.17	2.36	0.01	0.01	0.20	29.50	0.00	0.06	0.12	0.00	0.00	21.07						
	grader	Graders	1	6	6	147	174	1679	0.41	0.06	2.15	3.70	0.01	0.01	493.37	0.06	2.02	3.48	0.01	0.01	0.21	30.95	0.00	0.11	0.18	0.00	0.00	22.10						
	off-highway truck	Off-Highway Trucks	1	4	4	147	479	1909	0.38	0.08	1.29	2.60	0.01	0.01	489.68	0.13	2.08	4.19	0.01	0.01	0.36	52.67	0.01	0.11	0.22	0.00	0.00	37.62						
	water trucks	Off-Highway Trucks	2	4	8	147	200	1909	0.38	0.08	1.29	2.60	0.01	0.01	484.42	0.11	1.74	3.50	0.01	0.01	0.30	43.51	0.01	0.09	0.18	0.00	0.00	31.08						
	belly scraper	Scrapers	1	4	4	147	313	3625	0.48	0.08	1.29	2.60	0.01	0.01	487.01	0.11	1.72	3.46	0.01	0.01	0.29	43.24	0.01	0.09	0.18	0.00	0.00	30.88						
	wheeled loaders	Rubber Tired Loaders	2	8	16	147	165	3485	0.36	0.06	2.15	3.70	0.01	0.01	486.00	0.13	4.53	7.79	0.02	0.02	0.46	68.24	0.01	0.24	0.41	0.00	0.00	48.74						
	skip loader	Skid Steer Loaders	1	3	3	147	88	3821	0.37	0.11	2.14	3.70	0.01	0.01	486.66	0.02	0.46	0.79	0.00	0.00	0.05	6.96	0.00	0.02	0.04	0.00	0.00	4.97						
	backhoes	Tractors/Loaders/Backhoes	2	5	10	147	108	4199	0.37	0.11	2.14	3.70	0.01	0.01	490.16	0.10	1.89	3.26	0.01	0.01	0.20	28.79	0.01	0.10	0.17	0.00	0.00	20.57						
4	**Recharge Basin, Grading, and Above-ground Pipeline, Installation**															***0.08***	***1.51***	***2.61***	***0.01***	***0.01***	***0.16***	***3.29***	***0.00***	***0.02***	***0.03***	***0.00***	***0.00***	***3.29***	***0.01***	***0.20***	***0.34***	***0.00***	***0.00***	***40.74***
	backhoes	Tractors/Loaders/Backhoes	1	8	8	21	108	4199	0.37	0.11	2.14	3.70	0.01	0.01	490.16	0.08	1.51	2.61	0.01	0.01	0.16	3.29	0.00	0.02	0.03	0.00	0.00	3.29	0.01	0.20	0.34	0.00	0.00	40.74
5	**Extraction Wells, Installation**															***2.00***	***33.42***	***66.66***	***0.20***	***0.20***	***5.82***	***890.72***	***0.06***	***1.14***	***2.21***	***0.01***	***0.01***	***356.29***						
	drilling rig	Bore/Drill Rigs	1	24	24	90	500	439	0.50	0.08	1.29	2.60	0.01	0.01	481.27	1.06	17.15	34.56	0.11	0.11	2.90	261.19	0.02	0.31	0.62	0.00	0.00	104.47						
	hydraulic excavator	Excavators	1	6	6	600	180	1229	0.38	0.08	1.29	2.60	0.01	0.01	486.52	0.07	1.17	2.36	0.01	0.01	0.20	120.40	0.01	0.14	0.28	0.00	0.00	48.16						
	grader	Graders	1	6	6	600	174	1679	0.41	0.06	2.15	3.70	0.01	0.01	493.37	0.06	2.02	3.48	0.01	0.01	0.21	126.31	0.01	0.24	0.42	0.00	0.00	50.52						
	off-highway truck	Off-Highway Trucks	1	4	4	600	479	1909	0.38	0.08	1.29	2.60	0.01	0.01	489.68	0.13	2.08	4.19	0.01	0.01	0.36	214.99	0.02	0.25	0.50	0.00	0.00	85.99						
	small roller compactor	Rollers	1	1	1	600	114	3099	0.38	0.11	2.14	3.70	0.01	0.01	488.63	0.01	0.20	0.35	0.00	0.00	0.02	12.54	0.00	0.02	0.04	0.00	0.00	5.02						
	skip loader	Skid Steer Loaders	1	1	1	600	88	3821	0.37	0.11	2.14	3.70	0.01	0.01	486.66	0.01	0.15	0.26	0.00	0.00	0.02	9.47	0.00	0.02	0.03	0.00	0.00	3.79						
	wheeled loader	Rubber Tired Loaders	1	1	1	600	313	3485	0.36	0.08	1.29	2.60	0.01	0.01	481.27	0.02	0.32	0.65	0.00	0.00	0.05	32.70	0.00	0.04	0.08	0.00	0.00	13.08						
	water truck	Off-Highway Trucks	1	1	1	600	200	1909	0.38	0.08	1.29	2.60	0.01	0.01	484.42	0.01	0.22	0.44	0.00	0.00	0.04	22.20	0.00	0.03	0.05	0.00	0.00	8.88						
	Test pump	Pumps	1	24	24	45	200	2925	0.74	0.08	1.29	2.60	0.01	0.01	568.86	0.63	10.10	20.36	0.06	0.06	2.02	90.93	0.01	0.09	0.18	0.00	0.00	36.37						
6	**Booster Pump Station, Construction, and Water Storage, Construction**															***1.00***	***15.59***	***26.63***	***0.16***	***0.16***	***1.98***	***500.06***	***0.13***	***1.96***	***3.35***	***0.02***	***0.02***	***500.06***						
	crane	Cranes	1	6	6	252	190	745	0.29	0.08	1.29	2.60	0.01	0.01	487.75	0.06	0.93	1.88	0.01	0.01	0.16	40.37	0.01	0.12	0.24	0.00	0.00	40.37						
	hydraulic excavator	Excavators	1	6	6	252	180	1229	0.38	0.08	1.29	2.60	0.01	0.01	486.52	0.07	1.17	2.36	0.01	0.01	0.20	50.57	0.01	0.15	0.30	0.00	0.00	50.57						
	grader	Graders	1	6	6	252	174	1679	0.41	0.06	2.15	3.70	0.01	0.01	493.37	0.06	2.02	3.48	0.01	0.01	0.21	53.05	0.01	0.25	0.44	0.00	0.00	53.05						
	off-highway truck	Off-Highway Trucks	1	4	4	252	479	1909	0.38	0.08	1.29	2.60	0.01	0.01	489.68	0.13	2.08	4.19	0.01	0.01	0.36	90.29	0.02	0.26	0.53	0.00	0.00	90.29						
	water truck	Off-Highway Trucks	1	4	4	252	200	1909	0.38	0.08	1.29	2.60	0.01	0.01	484.42	0.05	0.87	1.75	0.01	0.01	0.15	37.30	0.01	0.11	0.22	0.00	0.00	37.30						
	belly scraper	Scrapers	1	4	4	252	313	3625	0.48	0.08	1.29	2.60	0.01	0.01	487.01	0.11	1.72	3.46	0.01	0.01	0.29	74.12	0.01	0.22	0.44	0.00	0.00	74.12						
	wheeled loader	Rubber Tired Loaders	1	8	8	252	165	3485	0.36	0.06	2.15	3.70	0.01	0.01	486.00	0.06	2.26	3.90	0.01	0.01	0.23	58.49	0.01	0.29	0.49	0.00	0.00	58.49						
	roller	Rollers	1	3	3	252	114	3099	0.38	0.11	2.14	3.70	0.01	0.01	488.63	0.03	0.61	1.05	0.00	0.00	0.06	15.80	0.00	0.08	0.13	0.00	0.00	15.80						
	backhoes	*Tractors/Loaders/Backhoes*	2	5	10	252	108	4199	0.37	0.11	2.14	3.70	0.01	0.01	490.16	0.10	1.89	3.26	0.01	0.01	0.20	49.36	0.01	0.24	0.41	0.00	0.00	49.36						
	skip loader	Skid Steer Loaders	1	1	1	252	88	3821	0.37	0.11	2.14	3.70	0.01	0.01	486.66	0.01	0.15	0.26	0.00	0.00	0.02	3.98	0.00	0.02	0.03	0.00	0.00	3.98						
	Welder	Welders	1	8	8	252	25	4529	0.45	0.79	4.60	2.50	0.22	0.22	570.29	0.16	0.91	0.50	0.04	0.04	0.05	12.93	0.02	0.11	0.06	0.01	0.01	12.93						
	Air compressor (for sandblasting/coating)	Air Compressors	1	8	8	252	25	241	0.48	0.79	4.60	2.50	0.22	0.22	570.29	0.17	0.97	0.53	0.05	0.05	0.05	13.80	0.02	0.12	0.07	0.01	0.01	13.80						
	2019 SUM OF ACTIVITIES (OFF-ROAD EXHAUST)																				***2019 SUM OF ACTIVITIES (OFF-ROAD EXHAUST), tpy***		0.23	3.96	7.14	0.03	0.03	1082.28						
	3,5,6 Months 1-5															*3.74*	*64.92*	*122.76*	*0.44*	*0.44*	*9.93*	*1702.48*												
	4,5,6 Months 6															*3.08*	*50.52*	*95.90*	*0.37*	*0.37*	*7.96*	*1394.06*												

AVEK HDWB

On-Road Construction Emissions, Daily and Annual--MITIGATED, plus Operations

	Project Component/On-Road Vehicles	Days	Trips/Day	Trip Distance (one-way)	Daily VMT	Emissions Factors (g/mi) ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	CO_2e	Emissions (lb/day) ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	MT/day CO_2e	MT/phase CO_2e	Emissions (tons/2019) ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	MT CO_2e	Annual Operational Emissions (tons/year) ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	MT CO_2e
1	**Monitoring Wells (Installation)**											***0.62***	***5.85***	***9.74***	***0.72***	***0.46***	***1.69***	***152.23***												
	worker vehicles	90	60	60	3,600	0.07	0.36	1.19	0.08	0.05	359.94	0.54	2.89	9.41	0.66	0.43	1.30	116.62												
	delivery vehicles	90	4	60	240	0.16	5.53	0.61	0.12	0.06	1,628.40	0.08	2.92	0.32	0.07	0.03	0.39	35.17												
	water truck	90	2	2	3	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.04	0.00	0.00	0.00	0.00	0.44												
2	**Aqueduct Turnout, Construction**											***0.79***	***11.70***	***10.38***	***0.86***	***0.53***	***2.47***	***519.36***												
	worker vehicles	210	60	60	3,600	0.07	0.36	1.19	0.08	0.05	359.94	0.54	2.89	9.41	0.66	0.43	1.30	272.12												
	delivery vehicles	210	12	60	720	0.16	5.53	0.61	0.12	0.06	1,628.40	0.25	8.77	0.97	0.20	0.10	1.17	246.21												
	water truck	210	2	2	3	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.04	0.00	0.00	0.00	0.00	1.03												
3	**Underground Pipelines, Trenching**											***0.62***	***5.85***	***9.74***	***0.72***	***0.46***	***1.69***	***248.65***	***0.01***	***0.12***	***0.20***	***0.02***	***0.01***	***248.65***						
	worker vehicles	147	60	60	3,600	0.07	0.36	1.19	0.08	0.05	359.94	0.54	2.89	9.41	0.66	0.43	1.30	190.48	0.01	0.06	0.20	0.01	0.01	190.48						
	delivery vehicles	147	4	60	240	0.16	5.53	0.61	0.12	0.06	1,628.40	0.08	2.92	0.32	0.07	0.03	0.39	57.45	0.00	0.06	0.01	0.00	0.00	57.45						
	water truck	147	2	2	3	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.04	0.00	0.00	0.00	0.00	0.72	0.00	0.00	0.00	0.00	0.00	0.72						
4	**Recharge Basin, Grading, and Above-ground Pipeline, Installation**											***0.54***	***2.92***	***9.41***	***0.66***	***0.43***	***1.30***	***27.31***	***0.01***	***0.03***	***0.10***	***0.01***	***0.00***	***27.31***	***0.07***	***0.38***	***1.22***	***0.09***	***0.06***	***338.18***
	worker vehicles	21	60	60	3,600	0.07	0.36	1.19	0.08	0.05	359.94	0.54	2.89	9.41	0.66	0.43	1.30	27.21	0.01	0.03	0.10	0.01	0.00	27.21	0.07	0.38	1.22	0.09	0.06	336.91
	delivery vehicles	21	0	60	-	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	water truck	21	2	2	3	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.04	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	1.27
5	**Extraction Wells, Installation**											***0.79***	***11.70***	***10.38***	***0.86***	***0.53***	***2.47***	***1483.88***	***0.14***	***2.11***	***1.87***	***0.15***	***0.09***	***1483.88***						
	worker vehicles	600	60	60	3,600	0.07	0.36	1.19	0.08	0.05	359.94	0.54	2.89	9.41	0.66	0.43	1.30	777.48	0.10	0.52	1.69	0.12	0.08	777.48						
	delivery vehicles	600	12	60	720	0.16	5.53	0.61	0.12	0.06	1,628.40	0.25	8.77	0.97	0.20	0.10	1.17	703.47	0.05	1.58	0.17	0.04	0.02	703.47						
	water truck	600	2	2	3	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.04	0.00	0.00	0.00	0.00	2.93	0.00	0.01	0.00	0.00	0.00	2.93						
6	**Booster Pump Station, Construction, and Water Storage, Construction**											***0.87***	***14.62***	***10.71***	***0.92***	***0.56***	***2.86***	***721.71***	***0.11***	***1.84***	***1.35***	***0.12***	***0.07***	***721.71***						
	worker vehicles	252	60	60	3,600	0.07	0.36	1.19	0.08	0.05	359.94	0.54	2.89	9.41	0.66	0.43	1.30	326.54	0.07	0.36	1.19	0.08	0.05	326.54						
	delivery vehicles	252	16	60	960	0.16	5.53	0.61	0.12	0.06	1,628.40	0.34	11.70	1.29	0.26	0.13	1.56	393.94	0.04	1.47	0.16	0.03	0.02	393.94						
	water truck	252	2	2	3	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.04	0.00	0.00	0.00	0.00	1.23	0.00	0.00	0.00	0.00	0.00	1.23						
	2019 SUM OF ACTIVITIES (ON-ROAD EXHAUST)																***2019 SUM OF ACTIVITIES (ON-ROAD EXHAUST), tpy***		0.27	4.10	3.52	0.29	0.18	2481.56						
	3,5,6 Months 1-5											*2.29*	*32.16*	*30.82*	*2.50*	*1.55*	*7.03*	*2454.24*												
	4,5,6 Months 6											*2.20*	*29.24*	*30.50*	*2.44*	*1.52*	*6.64*	*2232.91*												
	2019 SUM OF ACTIVITIES (OFF- AND ON-ROAD EXHAUST)											***6.02***	***97.09***	***153.59***	***2.94***	***1.99***	***16.95***	***4156.72 (HAUST), tpy***	0.50	8.06	10.66	0.32	0.21	3563.84						

AVEK HDWB
Off-Road Construction Emissions, Daily and Annual--UNMITIGATED

Construction Year: 2018

	Construction Phase/Equipment		Number	Usage Factor (hrs/day)	Total Hours/Day (Number * Usage Factor)	Total Days	Horsepower	Lookup Row	Load Factor	Emissions Factors (g/bhp-hr) ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	CO_2e	Emissions (lbs/day) ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	MT/day CO_2e	MT Per Phase CO_2e	Construction Emissions (tons/2018) ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	MT CO_2e
1	**Monitoring Wells (Installation)**															***2.14***	***26.29***	***15.72***	***0.84***	***0.78***	***3.14***	***71.06***	***0.03***	***0.33***	***0.20***	***0.01***	***0.01***	***71.06***
	drilling rig	Bore/Drill Rigs	1	24	24	20	500	430	0.50	0.13	1.75	1.03	0.05	0.05	489.92	1.79	23.21	13.72	0.69	0.64	2.95	59.08	0.02	0.23	0.14	0.01	0.01	59.08
	small roller compactor	Rollers	1	1	1	90	114	3092	0.38	0.48	4.65	3.61	0.32	0.29	496.50	0.05	0.44	0.34	0.03	0.03	0.02	1.91	0.00	0.02	0.02	0.00	0.00	1.91
	skip loader	Skid Steer Loaders	1	1	1	90	88	3818	0.37	0.22	2.86	3.28	0.14	0.13	494.37	0.02	0.20	0.23	0.01	0.01	0.02	1.44	0.00	0.01	0.01	0.00	0.00	1.44
	wheeled loader	Rubber Tired Loaders	1	1	1	90	313	3477	0.36	0.33	3.73	1.87	0.14	0.13	488.80	0.08	0.93	0.47	0.03	0.03	0.06	4.98	0.00	0.04	0.02	0.00	0.00	4.98
	water truck	Off-Highway Trucks	1	1	1	90	200	1904	0.38	0.34	3.45	1.54	0.14	0.13	491.89	0.06	0.58	0.26	0.02	0.02	0.04	3.38	0.00	0.03	0.01	0.00	0.00	3.38
	Test pump	Pumps	1	12	12	5	10	2916	0.74	0.77	4.76	3.58	0.26	0.26	570.23	0.15	0.93	0.70	0.05	0.05	0.05	0.25	0.00	0.00	0.00	0.00	0.00	0.25
2	**Aqueduct Turnout, Construction**															***1.48***	***15.90***	***9.32***	***0.79***	***0.73***	***0.88***	***184.47***	***0.16***	***1.67***	***0.98***	***0.08***	***0.08***	***184.47***
	crane	Cranes	1	6	6	210	190	738	0.29	0.48	5.77	2.13	0.25	0.23	495.69	0.35	4.18	1.55	0.18	0.17	0.16	34.19	0.04	0.44	0.16	0.02	0.02	34.19
	hydraulic excavator	Excavators	1	6	6	210	180	1222	0.38	0.20	2.59	1.15	0.08	0.07	494.53	0.18	2.36	1.05	0.07	0.07	0.20	42.83	0.02	0.25	0.11	0.01	0.01	42.83
	backhoe	Tractors/Loaders/Backhoes	1	5	5	210	108	4192	0.37	0.42	4.15	3.69	0.29	0.27	498.43	0.19	1.83	1.63	0.13	0.12	0.10	20.91	0.02	0.19	0.17	0.01	0.01	20.91
	roller compactor	Rollers	1	4	4	210	114	3092	0.38	0.48	4.65	3.61	0.32	0.29	496.50	0.18	1.75	1.36	0.12	0.11	0.08	17.84	0.02	0.18	0.14	0.01	0.01	17.84
	wheeled loader	Rubber Tired Loaders	1	6	6	210	165	3477	0.36	0.45	4.37	3.42	0.24	0.22	493.78	0.35	3.45	2.70	0.19	0.18	0.18	37.14	0.04	0.36	0.28	0.02	0.02	37.14
	water truck	Off-Highway Trucks	1	4	4	210	200	1904	0.38	0.34	3.45	1.54	0.14	0.13	491.89	0.23	2.32	1.04	0.10	0.09	0.15	31.56	0.02	0.24	0.11	0.01	0.01	31.56
3	**Underground Pipelines, Trenching**															***3.70***	***39.15***	***24.58***	***1.89***	***1.74***	***2.16***	***316.79***	***0.08***	***0.82***	***0.52***	***0.04***	***0.04***	***90.51***
	crane	Cranes	1	2	2	147	190	738	0.29	0.48	5.77	2.13	0.25	0.23	495.69	0.12	1.39	0.52	0.06	0.06	0.05	7.98	0.00	0.03	0.01	0.00	0.00	2.28
	hydraulic excavator	Excavators	1	6	6	147	180	1222	0.38	0.20	2.59	1.15	0.08	0.07	494.53	0.18	2.36	1.05	0.07	0.07	0.20	29.98	0.00	0.05	0.02	0.00	0.00	8.57
	grader	Graders	1	6	6	147	174	1673	0.41	0.66	6.60	3.71	0.37	0.34	501.71	0.62	6.21	3.49	0.35	0.32	0.21	31.47	0.01	0.13	0.07	0.01	0.01	8.99
	off-highway truck	Off-Highway Trucks	1	4	4	147	479	1904	0.38	0.29	3.09	1.56	0.11	0.10	497.81	0.46	4.98	2.52	0.18	0.17	0.36	53.55	0.01	0.10	0.05	0.00	0.00	15.30
	water trucks	Off-Highway Trucks	2	4	8	147	200	1904	0.38	0.34	3.45	1.54	0.14	0.13	491.89	0.46	4.65	2.08	0.19	0.18	0.30	44.18	0.01	0.10	0.04	0.00	0.00	12.62
	belly scraper	Scrapers	1	4	4	147	313	3620	0.48	0.37	4.57	2.83	0.18	0.17	495.05	0.49	6.08	3.77	0.24	0.22	0.30	43.95	0.01	0.13	0.08	0.01	0.00	12.56
	wheeled loaders	Rubber Tired Loaders	2	8	16	147	165	3477	0.36	0.45	4.37	3.42	0.24	0.22	493.78	0.94	9.20	7.21	0.51	0.47	0.47	69.33	0.02	0.19	0.15	0.01	0.01	19.81
	skip loader	Skid Steer Loaders	1	3	3	147	88	3818	0.37	0.22	2.86	3.28	0.14	0.13	494.37	0.05	0.61	0.70	0.03	0.03	0.05	7.07	0.00	0.01	0.01	0.00	0.00	2.02
	backhoes	Tractors/Loaders/Backhoes	2	5	10	147	108	4192	0.37	0.42	4.15	3.69	0.29	0.27	498.43	0.37	3.66	3.25	0.26	0.24	0.20	29.28	0.01	0.08	0.07	0.01	0.01	8.37
4	**Recharge Basin, Grading, and Above-ground Pipeline, Installation**															***0.30***	***2.93***	***2.60***	***0.21***	***0.19***	***0.16***	***3.35***						
	backhoes	Tractors/Loaders/Backhoes	1	8	8	21	108	4192	0.37	0.42	4.15	3.69	0.29	0.27	498.43	0.30	2.93	2.60	0.21	0.19	0.16	3.35						
5	**Extraction Wells, Installation**															***5.16***	***59.46***	***30.41***	***1.98***	***1.87***	***5.89***	***904.30***	***0.34***	***3.73***	***1.99***	***0.15***	***0.14***	***904.30***
	drilling rig	Bore/Drill Rigs	1	24	24	90	500	430	0.50	0.13	1.75	1.03	0.05	0.05	489.92	1.79	23.21	13.72	0.69	0.64	2.95	265.88	0.05	0.63	0.37	0.02	0.02	265.88
	hydraulic excavator	Excavators	1	6	6	600	180	1222	0.38	0.20	2.59	1.15	0.08	0.07	494.53	0.18	2.36	1.05	0.07	0.07	0.20	122.38	0.03	0.42	0.19	0.01	0.01	122.38
	grader	Graders	1	6	6	600	174	1673	0.41	0.66	6.60	3.71	0.37	0.34	501.71	0.62	6.21	3.49	0.35	0.32	0.21	128.44	0.11	1.12	0.63	0.06	0.06	128.44
	off-highway truck	Off-Highway Trucks	1	4	4	600	479	1904	0.38	0.29	3.09	1.56	0.11	0.10	497.81	0.46	4.98	2.52	0.18	0.17	0.36	218.55	0.08	0.90	0.45	0.03	0.03	218.55
	small roller compactor	Rollers	1	1	1	600	114	3092	0.38	0.48	4.65	3.61	0.32	0.29	496.50	0.05	0.44	0.34	0.03	0.03	0.02	12.74	0.01	0.08	0.06	0.01	0.00	12.74
	skip loader	Skid Steer Loaders	1	1	1	600	88	3818	0.37	0.22	2.86	3.28	0.14	0.13	494.37	0.02	0.20	0.23	0.01	0.01	0.02	9.62	0.00	0.04	0.04	0.00	0.00	9.62
	wheeled loader	Rubber Tired Loaders	1	1	1	600	313	3477	0.36	0.33	3.73	1.87	0.14	0.13	488.80	0.08	0.93	0.47	0.03	0.03	0.06	33.21	0.02	0.17	0.08	0.01	0.01	33.21
	water truck	Off-Highway Trucks	1	1	1	600	200	1904	0.38	0.34	3.45	1.54	0.14	0.13	491.89	0.06	0.58	0.26	0.02	0.02	0.04	22.54	0.01	0.10	0.05	0.00	0.00	22.54
	Test pump	Pumps	1	24	24	45	200	2916	0.74	0.24	2.62	1.07	0.08	0.08	568.89	1.90	20.55	8.34	0.59	0.59	2.02	90.93	0.03	0.28	0.11	0.01	0.01	90.93
6	**Booster Pump Station, Construction, and Water Storage, Construction**															***3.33***	***35.92***	***21.52***	***1.73***	***1.59***	***1.91***	***481.09***						
	crane	Cranes	1	6	6	252	190	738	0.29	0.48	5.77	2.13	0.25	0.23	495.69	0.35	4.18	1.55	0.18	0.17	0.16	41.03						
	hydraulic excavator	Excavators	1	6	6	252	180	1222	0.38	0.20	2.59	1.15	0.08	0.07	494.53	0.18	2.36	1.05	0.07	0.07	0.20	51.40						
	grader	Graders	1	6	6	252	174	1673	0.41	0.66	6.60	3.71	0.37	0.34	501.71	0.62	6.21	3.49	0.35	0.32	0.21	53.95						
	off-highway truck	Off-Highway Trucks	1	4	4	252	479	1904	0.38	0.29	3.09	1.56	0.11	0.10	497.81	0.46	4.98	2.52	0.18	0.17	0.36	91.79						
	water truck	Off-Highway Trucks	1	4	4	252	200	1904	0.38	0.34	3.45	1.54	0.14	0.13	491.89	0.23	2.32	1.04	0.10	0.09	0.15	37.87						
	belly scraper	Scrapers	1	4	4	252	313	3620	0.48	0.37	4.57	2.83	0.18	0.17	495.05	0.49	6.08	3.77	0.24	0.22	0.30	75.35						
	wheeled loader	Rubber Tired Loaders	1	8	8	252	165	3477	0.36	0.45	4.37	3.42	0.24	0.22	493.78	0.47	4.60	3.60	0.26	0.23	0.24	59.43						
	roller	Rollers	1	3	3	252	114	3092	0.38	0.48	4.65	3.61	0.32	0.29	496.50	0.14	1.32	1.02	0.09	0.08	0.06	16.05						
	backhoes	*Tractors/Loaders/Backhoes*	2	5	10	252	108	4192	0.37	0.42	4.15	3.69	0.29	0.27	498.43	0.37	3.66	3.25	0.26	0.24	0.20	50.19						
	skip loader	Skid Steer Loaders	1	1	1	252	88	3818	0.37	0.22	2.86	3.28	0.14	0.13	494.37	0.02	0.20	0.23	0.01	0.01	0.02	4.04						
	Welder	Welders	1	8	8	252	25	4522	0.45	0.81	4.66	2.53	0.23	0.23	570.32	0.16	0.92	0.50	0.05	0.05	0.05	12.93						
	Air compressor (for sandblasting/coating)	Air Compressors	1	8	8	252	25	232	0.48	0.81	4.66	2.53	0.23	0.23	570.32	0.17	0.99	0.54	0.05	0.05	0.05	13.80						
	2018 SUM OF ACTIVITIES (OFF-ROAD EXHAUST)																					***2018 SUM OF ACTIVITIES (OFF-ROAD EXHAUST), tpy***	0.60	6.55	3.68	0.29	0.26	1250.34
	1,2,5 Months 1-3															*8.79*	*101.65*	*55.46*	*3.62*	*3.38*	*9.90*	*1159.83*						
	or 3,5 Months 11,12															*8.85*	*98.61*	*54.99*	*3.88*	*3.61*	*8.04*	*1221.09*						

AVEK HDWB
On-Road Construction Emissions, Daily and Annual--UNMITIGATED

	Project Component/On-Road Vehicles	Days	Trips/Day	Trip Distance (one-way)	Daily VMT	Emissions Factors (g/mi) ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	CO_2e	Emissions (lb/day) ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	MT/day CO_2e	MT/phase CO_2e	Emissions (tons/2018) ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	MT CO_2e
1	**Monitoring Wells (Installation)**											***0.62***	***5.85***	***9.74***	***0.72***	***0.46***	***1.69***	***152.23***	***0.03***	***0.26***	***0.44***	***0.03***	***0.02***	***0.08***
	worker vehicles	90	60	60	3,600	0.07	0.36	1.19	0.08	0.05	359.94	0.54	2.89	9.41	0.66	0.43	1.30	116.62	0.02	0.13	0.42	0.03	0.02	0.06
	delivery vehicles	90	4	60	240	0.16	5.53	0.61	0.12	0.06	1,628.40	0.08	2.92	0.32	0.07	0.03	0.39	35.17	0.00	0.13	0.01	0.00	0.00	0.02
	water truck	90	2	1.5	3	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.04	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00
2	**Aqueduct Turnout, Construction**											***0.79***	***11.70***	***10.38***	***0.86***	***0.53***	***2.47***	***519.36***	***0.08***	***1.23***	***1.09***	***0.09***	***0.06***	***0.26***
	worker vehicles	210	60	60	3,600	0.07	0.36	1.19	0.08	0.05	359.94	0.54	2.89	9.41	0.66	0.43	1.30	272.12	0.06	0.30	0.99	0.07	0.05	0.14
	delivery vehicles	210	12	60	720	0.16	5.53	0.61	0.12	0.06	1,628.40	0.25	8.77	0.97	0.20	0.10	1.17	246.21	0.03	0.92	0.10	0.02	0.01	0.12
	water truck	210	2	1.5	3	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.04	0.00	0.00	0.00	0.00	1.03	0.00	0.00	0.00	0.00	0.00	0.00
3	**Underground Pipelines, Trenching**											***0.62***	***5.85***	***9.74***	***0.72***	***0.46***	***1.69***	***248.65***	***0.01***	***0.12***	***0.20***	***0.02***	***0.01***	***0.04***
	worker vehicles	147	60	60	3,600	0.07	0.36	1.19	0.08	0.05	359.94	0.54	2.89	9.41	0.66	0.43	1.30	190.48	0.01	0.06	0.20	0.01	0.01	0.03
	delivery vehicles	147	4	60	240	0.16	5.53	0.61	0.12	0.06	1,628.40	0.08	2.92	0.32	0.07	0.03	0.39	57.45	0.00	0.06	0.01	0.00	0.00	0.01
	water truck	147	2	1.5	3	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.04	0.00	0.00	0.00	0.00	0.72	0.00	0.00	0.00	0.00	0.00	0.00
4	**Recharge Basin, Grading, and Above-ground Pipeline, Installation**											***0.54***	***2.92***	***9.41***	***0.66***	***0.43***	***1.30***	***27.31***						
	worker vehicles	21	60	60	3,600	0.07	0.36	1.19	0.08	0.05	359.94	0.54	2.89	9.41	0.66	0.43	1.30	27.21						
	delivery vehicles	21	0	60	-	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
	water truck	21	2	1.5	3	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.04	0.00	0.00	0.00	0.00	0.10						
5	**Extraction Wells, Installation**											***0.79***	***11.70***	***10.38***	***0.86***	***0.53***	***2.47***	***1483.88***	***0.14***	***2.11***	***1.87***	***0.15***	***0.09***	***0.45***
	worker vehicles	600	60	60	3,600	0.07	0.36	1.19	0.08	0.05	359.94	0.54	2.89	9.41	0.66	0.43	1.30	777.48	0.10	0.52	1.69	0.12	0.08	0.23
	delivery vehicles	600	12	60	720	0.16	5.53	0.61	0.12	0.06	1,628.40	0.25	8.77	0.97	0.20	0.10	1.17	703.47	0.05	1.58	0.17	0.04	0.02	0.21
	water truck	600	2	1.5	3	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.04	0.00	0.00	0.00	0.00	2.93	0.00	0.01	0.00	0.00	0.00	0.00

6	**Booster Pump Station, Construction, and Water Storage, Construction**											***0.87***	***14.62***	***10.71***	***0.92***	***0.56***	***2.86***	***721.71***							
	worker vehicles	252	60	60	3,600	0.07	0.36	1.19	0.08	0.05	359.94	0.54	2.89	9.41	0.66	0.43	1.30	326.54							
	delivery vehicles	252	16	60	960	0.16	5.53	0.61	0.12	0.06	1,628.40	0.34	11.70	1.29	0.26	0.13	1.56	393.94							
	water truck	252	2	1.5	3	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.04	0.00	0.00	0.00	0.00	1.23							
	2018 SUM OF ACTIVITIES (ON-ROAD EXHAUST)																	***2018 SUM OF ACTIVITIES (ON-ROAD EXHAUST), tpy***	0.27	3.72	3.60	0.29	0.18	0.82
	1,2,5 Months 1-3											*2.20*	*29.24*	*30.50*	*2.44*	*1.52*	*6.64*	*2155.47*						
	or 3,5 Months 11,12											*1.41*	*17.54*	*20.12*	*1.58*	*0.99*	*4.16*	*1732.53*						
	2018 SUM OF ACTIVITIES (OFF- AND ON-ROAD EXHAUST)											***10.99***	***130.89***	***85.96***	***6.05***	***4.90***	***16.54***	***3315.31 ST), tpy***	0.87	10.27	7.28	0.58	0.45	1251.16

AVEK HDWB

Off-Road Construction Emissions, Daily and Annual--UNMITIGATED, plus Operations

Construction Year: 2019

	Construction Phase/Equipment		Number	Usage Factor (hrs/day)	Total Hours/Day (Number * Usage Factor)	Total Days	Horsepower	Lookup Row	Load Factor	Emissions Factors (g/bhp-hr) ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	CO_2e	Emissions (lbs/day) ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	MT/day CO_2e	MT Per Phase CO_2e	Construction Emissions (tons/2019) ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	MT CO_2e	Annual Operational Emissions (tons/year) ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	MT CO_2e
1	**Monitoring Wells (Installation)**															***2.05***	***23.44***	***15.70***	***0.77***	***0.71***	***3.08***	***69.83***												
	drilling rig	Bore/Drill Rigs	1	24	24	20	500	439	0.50	0.13	1.55	1.03	0.05	0.04	481.27	1.72	20.62	13.75	0.64	0.59	2.90	58.04												
	small roller compactor	Rollers	1	1	1	90	114	3099	0.38	0.42	4.18	3.56	0.27	0.25	488.63	0.04	0.39	0.34	0.03	0.02	0.02	1.88												
	skip loader	Skid Steer Loaders	1	1	1	90	88	3821	0.37	0.20	2.66	3.28	0.12	0.11	486.66	0.01	0.19	0.23	0.01	0.01	0.02	1.42												
	wheeled loader	Rubber Tired Loaders	1	1	1	90	313	3485	0.36	0.31	3.29	1.72	0.12	0.11	481.27	0.08	0.82	0.43	0.03	0.03	0.05	4.91												
	water truck	Off-Highway Trucks	1	1	1	90	200	1909	0.38	0.31	2.98	1.46	0.12	0.11	484.42	0.05	0.50	0.25	0.02	0.02	0.04	3.33												
	Test pump	Pumps	1	12	12	5	10	2925	0.74	0.75	4.65	3.56	0.24	0.24	570.18	0.15	0.91	0.70	0.05	0.05	0.05	0.25												
2	**Aqueduct Turnout, Construction**															***1.33***	***13.98***	***9.03***	***0.68***	***0.62***	***0.86***	***181.54***												
	crane	Cranes	1	6	6	210	190	745	0.29	0.43	5.08	1.94	0.22	0.20	487.75	0.31	3.68	1.41	0.16	0.14	0.16	33.64												
	hydraulic excavator	Excavators	1	6	6	210	180	1229	0.38	0.19	2.24	1.13	0.07	0.06	486.52	0.17	2.04	1.02	0.06	0.06	0.20	42.14												
	backhoe	Tractors/Loaders/Backhoes	1	5	5	210	108	4199	0.37	0.37	3.69	3.64	0.25	0.23	490.16	0.16	1.63	1.60	0.11	0.10	0.10	20.57												
	roller compactor	Rollers	1	4	4	210	114	3099	0.38	0.42	4.18	3.56	0.27	0.25	488.63	0.16	1.58	1.34	0.10	0.10	0.08	17.56												
	wheeled loader	Rubber Tired Loaders	1	6	6	210	165	3485	0.36	0.41	3.86	3.38	0.21	0.20	486.00	0.32	3.05	2.67	0.17	0.15	0.17	36.56												
	water truck	Off-Highway Trucks	1	4	4	210	200	1909	0.38	0.31	2.98	1.46	0.12	0.11	484.42	0.21	2.01	0.98	0.08	0.07	0.15	31.08												
3	**Underground Pipelines, Trenching**															***3.36***	***34.73***	***23.77***	***1.66***	***1.52***	***2.12***	***311.71***	***0.18***	***1.82***	***1.25***	***0.09***	***0.08***	***222.65***						
	crane	Cranes	1	2	2	147	190	745	0.29	0.43	5.08	1.94	0.22	0.20	487.75	0.10	1.23	0.47	0.05	0.05	0.05	7.85	0.01	0.06	0.02	0.00	0.00	5.61						
	hydraulic excavator	Excavators	1	6	6	147	180	1229	0.38	0.19	2.24	1.13	0.07	0.06	486.52	0.17	2.04	1.02	0.06	0.06	0.20	29.50	0.01	0.11	0.05	0.00	0.00	21.07						
	grader	Graders	1	6	6	147	174	1679	0.41	0.61	6.01	3.66	0.34	0.31	493.37	0.57	5.66	3.44	0.32	0.29	0.21	30.95	0.03	0.30	0.18	0.02	0.02	22.10						
	off-highway truck	Off-Highway Trucks	1	4	4	147	479	1909	0.38	0.26	2.67	1.48	0.10	0.09	489.68	0.43	4.30	2.39	0.16	0.14	0.36	52.67	0.02	0.23	0.13	0.01	0.01	37.62						
	water trucks	Off-Highway Trucks	2	4	8	147	200	1909	0.38	0.31	2.98	1.46	0.12	0.11	484.42	0.41	4.02	1.97	0.16	0.15	0.30	43.51	0.02	0.21	0.10	0.01	0.01	31.08						
	belly scraper	Scrapers	1	4	4	147	313	3625	0.48	0.34	4.16	2.59	0.16	0.15	487.01	0.46	5.53	3.45	0.22	0.20	0.29	43.24	0.02	0.29	0.18	0.01	0.01	30.88						
	wheeled loaders	Rubber Tired Loaders	2	8	16	147	165	3485	0.36	0.41	3.86	3.38	0.21	0.20	486.00	0.85	8.13	7.12	0.45	0.41	0.46	68.24	0.04	0.43	0.37	0.02	0.02	48.74						
	skip loader	Skid Steer Loaders	1	3	3	147	88	3821	0.37	0.20	2.66	3.28	0.12	0.11	486.66	0.04	0.57	0.70	0.03	0.02	0.05	6.96	0.00	0.03	0.04	0.00	0.00	4.97						
	backhoes	Tractors/Loaders/Backhoes	2	5	10	147	108	4199	0.37	0.37	3.69	3.64	0.25	0.23	490.16	0.32	3.25	3.20	0.22	0.20	0.20	28.79	0.02	0.17	0.17	0.01	0.01	20.57						
4	**Recharge Basin, Grading, and Above-ground Pipeline, Installation**															***0.26***	***2.60***	***2.56***	***0.17***	***0.16***	***0.16***	***3.29***	***0.00***	***0.03***	***0.03***	***0.00***	***0.00***	***3.29***	***0.03***	***0.34***	***0.33***	***0.02***	***0.02***	***40.74***
	backhoes	Tractors/Loaders/Backhoes	1	8	8	21	108	4199	0.37	0.37	3.69	3.64	0.25	0.23	490.16	0.26	2.60	2.56	0.17	0.16	0.16	3.29	0.00	0.03	0.03	0.00	0.00	3.29	0.03	0.34	0.33	0.02	0.02	40.74
5	**Extraction Wells, Installation**															***4.84***	***52.72***	***30.09***	***1.78***	***1.68***	***5.82***	***890.72***	***0.21***	***2.20***	***1.29***	***0.09***	***0.08***	***356.29***						
	drilling rig	Bore/Drill Rigs	1	24	24	90	500	439	0.50	0.13	1.55	1.03	0.05	0.04	481.27	1.72	20.62	13.75	0.64	0.59	2.90	261.19	0.03	0.37	0.25	0.01	0.01	104.47						
	hydraulic excavator	Excavators	1	6	6	600	180	1229	0.38	0.19	2.24	1.13	0.07	0.06	486.52	0.17	2.04	1.02	0.06	0.06	0.20	120.40	0.02	0.24	0.12	0.01	0.01	48.16						
	grader	Graders	1	6	6	600	174	1679	0.41	0.61	6.01	3.66	0.34	0.31	493.37	0.57	5.66	3.44	0.32	0.29	0.21	126.31	0.07	0.68	0.41	0.04	0.03	50.52						
	off-highway truck	Off-Highway Trucks	1	4	4	600	479	1909	0.38	0.26	2.67	1.48	0.10	0.09	489.68	0.43	4.30	2.39	0.16	0.14	0.36	214.99	0.05	0.52	0.29	0.02	0.02	85.99						
	small roller compactor	Rollers	1	1	1	600	114	3099	0.38	0.42	4.18	3.56	0.27	0.25	488.63	0.04	0.39	0.34	0.03	0.02	0.02	12.54	0.00	0.05	0.04	0.00	0.00	5.02						
	skip loader	Skid Steer Loaders	1	1	1	600	88	3821	0.37	0.20	2.66	3.28	0.12	0.11	486.66	0.01	0.19	0.23	0.01	0.01	0.02	9.47	0.00	0.02	0.03	0.00	0.00	3.79						
	wheeled loader	Rubber Tired Loaders	1	1	1	600	313	3485	0.36	0.31	3.29	1.72	0.12	0.11	481.27	0.08	0.82	0.43	0.03	0.03	0.05	32.70	0.01	0.10	0.05	0.00	0.00	13.08						
	water truck	Off-Highway Trucks	1	1	1	600	200	1909	0.38	0.31	2.98	1.46	0.12	0.11	484.42	0.05	0.50	0.25	0.02	0.02	0.04	22.20	0.01	0.06	0.03	0.00	0.00	8.88						
	Test pump	Pumps	1	24	24	45	200	2925	0.74	0.23	2.32	1.05	0.07	0.07	568.86	1.77	18.19	8.24	0.52	0.52	2.02	90.93	0.02	0.16	0.07	0.00	0.00	36.37						
6	**Booster Pump Station, Construction, and Water Storage, Construction**															***3.35***	***33.80***	***21.73***	***1.61***	***1.49***	***1.98***	***500.06***	***0.42***	***4.26***	***2.74***	***0.20***	***0.19***	***500.06***						
	crane	Cranes	1	6	6	252	190	745	0.29	0.43	5.08	1.94	0.22	0.20	487.75	0.31	3.68	1.41	0.16	0.14	0.16	40.37	0.04	0.46	0.18	0.02	0.02	40.37						
	hydraulic excavator	Excavators	1	6	6	252	180	1229	0.38	0.19	2.24	1.13	0.07	0.06	486.52	0.17	2.04	1.02	0.06	0.06	0.20	50.57	0.02	0.26	0.13	0.01	0.01	50.57						
	grader	Graders	1	6	6	252	174	1679	0.41	0.61	6.01	3.66	0.34	0.31	493.37	0.57	5.66	3.44	0.32	0.29	0.21	53.05	0.07	0.71	0.43	0.04	0.04	53.05						
	off-highway truck	Off-Highway Trucks	1	4	4	252	479	1909	0.38	0.26	2.67	1.48	0.10	0.09	489.68	0.43	4.30	2.39	0.16	0.14	0.36	90.29	0.05	0.54	0.30	0.02	0.02	90.29						
	water truck	Off-Highway Trucks	1	4	4	252	200	1909	0.38	0.31	2.98	1.46	0.12	0.11	484.42	0.21	2.01	0.98	0.08	0.07	0.15	37.30	0.03	0.25	0.12	0.01	0.01	37.30						
	belly scraper	Scrapers	1	4	4	252	313	3625	0.48	0.34	4.16	2.59	0.16	0.15	487.01	0.46	5.53	3.45	0.22	0.20	0.29	74.12	0.06	0.70	0.44	0.03	0.03	74.12						
	wheeled loader	Rubber Tired Loaders	1	8	8	252	165	3485	0.36	0.41	3.86	3.38	0.21	0.20	486.00	0.43	4.06	3.56	0.22	0.21	0.23	58.49	0.05	0.51	0.45	0.03	0.03	58.49						
	roller	Rollers	1	3	3	252	114	3099	0.38	0.42	4.18	3.56	0.27	0.25	488.63	0.12	1.18	1.01	0.08	0.07	0.06	15.80	0.02	0.15	0.13	0.01	0.01	15.80						
	backhoes	*Tractors/Loaders/Backhoes*	2	5	10	252	108	4199	0.37	0.37	3.69	3.64	0.25	0.23	490.16	0.32	3.25	3.20	0.22	0.20	0.20	49.36	0.04	0.41	0.40	0.03	0.03	49.36						
	skip loader	Skid Steer Loaders	1	1	1	252	88	3821	0.37	0.20	2.66	3.28	0.12	0.11	486.66	0.01	0.19	0.23	0.01	0.01	0.02	3.98	0.00	0.02	0.03	0.00	0.00	3.98						
	Welder	Welders	1	8	8	252	25	4529	0.45	0.79	4.60	2.50	0.22	0.22	570.29	0.16	0.91	0.50	0.04	0.04	0.05	12.93	0.02	0.11	0.06	0.01	0.01	12.93						
	Air compressor (for sandblasting/coating)	Air Compressors	1	8	8	252	25	241	0.48	0.79	4.60	2.50	0.22	0.22	570.29	0.17	0.97	0.53	0.05	0.05	0.05	13.80	0.02	0.12	0.07	0.01	0.01	13.80						
	2019 SUM OF ACTIVITIES (OFF-ROAD EXHAUST)																				***2019 SUM OF ACTIVITIES (OFF-ROAD EXHAUST), tpy***		0.81	8.31	5.31	0.38	0.35	1082.28						
	3,5,6 Months 1-5															*11.54*	*121.25*	*75.60*	*5.05*	*4.69*	*9.93*	*1702.48*												
	4,5,6 Months 6															*8.44*	*89.12*	*54.39*	*3.56*	*3.33*	*7.96*	*1394.06*												

AVEK HDWB

On-Road Construction Emissions, Daily and Annual--UNMITIGATED, plus Operations

	Project Component/On-Road Vehicles	Days	Trips/Day	Trip Distance (one-way)	Daily VMT	Emissions Factors (g/mi) ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	CO_2e	Emissions (lb/day) ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	MT/day CO_2e	MT/phase CO_2e	Emissions (tons/2019) ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	MT CO_2e	Annual Operational Emissions (tons/year) ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	MT CO_2e
1	**Monitoring Wells (Installation)**											***0.62***	***5.85***	***9.74***	***0.72***	***0.46***	***1.69***	***152.23***												
	worker vehicles	90	60	60	3,600	0.07	0.36	1.19	0.08	0.05	359.94	0.54	2.89	9.41	0.66	0.43	1.30	116.62												
	delivery vehicles	90	4	60	240	0.16	5.53	0.61	0.12	0.06	1,628.40	0.08	2.92	0.32	0.07	0.03	0.39	35.17												
	water truck	90	2	2	3	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.04	0.00	0.00	0.00	0.00	0.44												
2	**Aqueduct Turnout, Construction**											***0.79***	***11.70***	***10.38***	***0.86***	***0.53***	***2.47***	***519.36***												
	worker vehicles	210	60	60	3,600	0.07	0.36	1.19	0.08	0.05	359.94	0.54	2.89	9.41	0.66	0.43	1.30	272.12												
	delivery vehicles	210	12	60	720	0.16	5.53	0.61	0.12	0.06	1,628.40	0.25	8.77	0.97	0.20	0.10	1.17	246.21												
	water truck	210	2	2	3	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.04	0.00	0.00	0.00	0.00	1.03												
3	**Underground Pipelines, Trenching**											***0.62***	***5.85***	***9.74***	***0.72***	***0.46***	***1.69***	***248.65***	***0.01***	***0.12***	***0.20***	***0.02***	***0.01***	***248.65***						
	worker vehicles	147	60	60	3,600	0.07	0.36	1.19	0.08	0.05	359.94	0.54	2.89	9.41	0.66	0.43	1.30	190.48	0.01	0.06	0.20	0.01	0.01	190.48						
	delivery vehicles	147	4	60	240	0.16	5.53	0.61	0.12	0.06	1,628.40	0.08	2.92	0.32	0.07	0.03	0.39	57.45	0.00	0.06	0.01	0.00	0.00	57.45						
	water truck	147	2	2	3	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.04	0.00	0.00	0.00	0.00	0.72	0.00	0.00	0.00	0.00	0.00	0.72						
4	**Recharge Basin, Grading, and Above-ground Pipeline, Installation**											***0.54***	***2.92***	***9.41***	***0.66***	***0.43***	***1.30***	***27.31***	***0.01***	***0.03***	***0.10***	***0.01***	***0.00***	***27.31***	***0.07***	***0.38***	***1.22***	***0.09***	***0.06***	***338.18***
	worker vehicles	21	60	60	3,600	0.07	0.36	1.19	0.08	0.05	359.94	0.54	2.89	9.41	0.66	0.43	1.30	27.21	0.01	0.03	0.10	0.01	0.00	27.21	0.07	0.38	1.22	0.09	0.06	336.91
	delivery vehicles	21	0	60	-	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	water truck	21	2	2	3	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.04	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	1.27
5	**Extraction Wells, Installation**											***0.79***	***11.70***	***10.38***	***0.86***	***0.53***	***2.47***	***1483.88***	***0.14***	***2.11***	***1.87***	***0.15***	***0.09***	***1483.88***						
	worker vehicles	600	60	60	3,600	0.07	0.36	1.19	0.08	0.05	359.94	0.54	2.89	9.41	0.66	0.43	1.30	777.48	0.10	0.52	1.69	0.12	0.08	777.48						
	delivery vehicles	600	12	60	720	0.16	5.53	0.61	0.12	0.06	1,628.40	0.25	8.77	0.97	0.20	0.10	1.17	703.47	0.05	1.58	0.17	0.04	0.02	703.47						
	water truck	600	2	2	3	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.04	0.00	0.00	0.00	0.00	2.93	0.00	0.01	0.00	0.00	0.00	2.93						
6	**Booster Pump Station, Construction, and Water Storage, Construction**											***0.87***	***14.62***	***10.71***	***0.92***	***0.56***	***2.86***	***721.71***	***0.11***	***1.84***	***1.35***	***0.12***	***0.07***	***721.71***						
	worker vehicles	252	60	60	3,600	0.07	0.36	1.19	0.08	0.05	359.94	0.54	2.89	9.41	0.66	0.43	1.30	326.54	0.07	0.36	1.19	0.08	0.05	326.54						
	delivery vehicles	252	16	60	960	0.16	5.53	0.61	0.12	0.06	1,628.40	0.34	11.70	1.29	0.26	0.13	1.56	393.94	0.04	1.47	0.16	0.03	0.02	393.94						
	water truck	252	2	2	3	0.16	5.53	0.61	0.12	0.06	1,628.40	0.00	0.04	0.00	0.00	0.00	0.00	1.23	0.00	0.00	0.00	0.00	0.00	1.23						
	2019 SUM OF ACTIVITIES (ON-ROAD EXHAUST)																***2019 SUM OF ACTIVITIES (ON-ROAD EXHAUST), tpy***		0.27	4.10	3.52	0.29	0.18	2481.56						
	3,5,6 Months 1-5											*2.29*	*32.16*	*30.82*	*2.50*	*1.55*	*7.03*	*2454.24*												
	4,5,6 Months 6											*2.20*	*29.24*	*30.50*	*2.44*	*1.52*	*6.64*	*2232.91*												
	2019 SUM OF ACTIVITIES (OFF- AND ON-ROAD EXHAUST)											***13.83***	***153.41***	***106.42***	***7.55***	***6.24***	***16.95***	***4156.72 EXHAUST), tpy***	1.08	12.41	8.83	0.67	0.53	3563.84						

AVEK HDWB
Paved Roads Fugitive Dust Emissions

CONSTRUCTION

		Vehicle Type	Trips/Day		Trip Distance (one-way), miles	Paved Road Dust Emissions (lbs/day)		Annual Paved Road Dust Emissions (tons/2018)		Annual Paved Road Dust Emissions (tons/2019)	
						PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
1	Monitoring Wells (Installation)	Worker/Pick Up			60	-	-	-	-		
2	Aqueduct Turnout, Construction	Worker/Pick Up			60	-	-	-	-		
3	Underground Pipelines, Trenching	Worker/Pick Up			60	-	-	-	-	-	-
4	Recharge Basin, Grading, and Above-gr	Worker/Pick Up			60	-	-			-	-
5	Extraction Wells, Installation	Worker/Pick Up	60		60	2.33	0.57	0.350	0.086	0.350	0.086
6	Booster Pump Station, Construction, ar	Worker/Pick Up			60	-	-			-	-

Since all overlapping groups include Activity 5, emissions associated with the maximum 30 employee roundtrips were calculated there. PM emissions include onsite & offsite travel.
Conservatively assumed an average worker/delivery trip distance of... 60 miles (one-way) occurs within Mojave Desert Air Basin (MDAB).

		Vehicle Type	Trips/Day	Total Trips	Trip Distance (one-way), miles	Paved Road Dust Emissions (lbs/day)		Annual Paved Road Dust Emissions (tons/2018)		Annual Paved Road Dust Emissions (tons/2019)	
						PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
1	Monitoring Wells (Installation)	Delivery Trucks	4	20	60	0.99	0.24	0.002	0.001		
2	Aqueduct Turnout, Construction	Delivery Trucks	12	24	60	2.97	0.73	0.003	0.001		
3	Underground Pipelines, Trenching	Delivery Trucks	4	360	60	0.99	0.24	0.013	0.003	0.032	0.008
4	Recharge Basin, Grading, and Above-gr	Delivery Trucks	0	0	60	-	-			-	-
5	Extraction Wells, Installation	Delivery Trucks	12	384	60	2.97	0.73	0.029	0.007	0.019	0.004
6	Booster Pump Station, Construction, ar	Delivery Trucks	16	72	60	3.96	0.97			0.009	0.002

PM emissions include onsite & offsite travel. Daily trip counts based on estimated maximum deliveries per day, multiplied by two (for total one-way trips). Total trips distributed between years based on project component duration.
Conservatively assumed an average worker/delivery trip distance of... 60 miles (one-way) occurs within MDAB.

Paved Road Dust $EF_{DUST} = [(k(sL)^{0.91} \times (W)^{1.02}](1 - P/4N))$

Source: AP-42 Section 13.2.1 (Paved Roads) - http://www.epa.gov/ttnchie1/ap42/ch13/final/c13s0201.pdf

Variable	Value	Description	Notes
k (PM10)	0.0022	particle size multiplier for particle size range and units of interest (lb/VMT)	
k (PM2.5)	0.00054	particle size multiplier for particle size range and units of interest (lb/VMT)	
sL	0.1	road surface silt loading (g/m^2)	
W	2.4	average weight (tons) of vehicles (2.4 tons)	
W	14.75	haul truck tons	
P	30	number of "wet" days with at least 0.254 mm of precipitation during the averaging period	conservative value chosen
N	365	number of days in averaging period	

Pickup and Worker

EF (PM10)	0.000647473	lb/VMT
EF (PM2.5)	0.000158925	lb/VMT

Haul Truck

EF (PM10)	0.004126423	lb/VMT
EF (PM2.5)	0.001012849	lb/VMT

OPERATIONS

		Vehicle Type	Trips/Day		Trip Distance (one-way), miles	Paved Road Dust Emissions (lbs/day)		Annual Paved Road Dust Emissions (tons/year)		Annual Paved Road Dust Emissions (tons/year)	
						PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
4	Recharge Basin, Grading, and Above-gr	Worker/Pick Up	4		60	0.16	0.04			0.002	0.000

Conservatively assumed an average worker distance of... 60 miles (one-way) occurs within Mojave Desert Air Basin (MDAB).
Assume worst case of two employees/trucks per day, during times of pipe relocations. Assume negligible emissions due to deliveries.

Construction Summary (controlled)

	ACTIVITY	Max Daily (lb/day) PM10	Max Daily (lb/day) PM2.5	Annual-2018 (tons) PM10	Annual-2018 (tons) PM2.5	Annual-2019 (tons) PM10	Annual-2019 (tons) PM2.5
1	Monitoring Wells (Installation)	0.59	0.32	0.03	0.01		
2	Aqueduct Turnout, Construction	3.53	1.83	0.35	0.19		
3	Underground Pipelines, Trenching	4.93	1.92	0.10	0.04	0.26	0.10
4	Recharge Basin, Grading, and Above-ground Pipeline, Instal	2.35	1.29			0.02	0.01
5	Extraction Wells, Installation	2.06	1.13	0.37	0.20	0.25	0.14
6	Booster Pump Station, Construction, and Water Storage, C	3.24	1.66			0.41	0.21

Operations Summary (uncontrolled)

	ACTIVITY	Max Daily (lb/day) PM10	Max Daily (lb/day) PM2.5	Annual (tons) PM10	Annual (tons) PM2.5
4	Recharge Basin, Grading, and Ab	6.02	3.32	0.782871	0.431408

ACTIVITY 1
Monitoring Wells, Installation

Activity	Equipment	Daily Activity Level	Total Activity Level	PM10 Emission Factor (lb/activity)	PM2.5 Emission Factor (lb/activity)	Uncontrolled PM10 (lb/day)	Uncontrolled PM2.5 (lb/day)	Controlled[1] Daily PM_{10} (lbs/day)	Controlled[1] Daily $PM_{2.5}$ (lbs/day)	Uncontrolled PM10 (tons/2018)	Uncontrolled PM2.5 (tons/2018)	Controlled[1] Daily PM10 (tons/2018)	Controlled[1] Daily PM2.5 (tons/2018)
Drill Pad Grading / Spread Drilling Spoils	2	1.0	2.0	0.75	0.41	1.51	0.83	0.59	0.32	0.07	0.04	0.03	0.01

Note: Assume grading/spread equipment includes Skid Loader and Rubber-tired Loader.
[1] Control efficiency from watering every three hours (60%), from Table XI-A Mitigation Measure Examples. (SCAQMD = 0.61

ACTIVITY 2
Aqueduct Turnout

Info from Questions/Responses of AECOM:
Excavation (qty): 250 cu yd/day (assume single day of excavating equal to 250 cu yd/day)

Emission Factors for Excavation/Stockpiling

PM10 0.003129615 lb/cu yd (soil)
PM2.5 0.000473913 lb/cu yd (soil)

Emissions Estimates

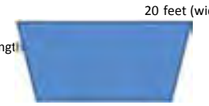
			Controlled				Controlled		
PM10	0.782403681	lb/day (excavat	0.30513744	lb/day (excavation)	0.035208166	ton PM10/2018	0.013731185	ton PM10/2018	ton PM10/2019
PM2.5	0.118478272	lb/day (excavat	0.04620653	lb/day (excavation)	0.005331522	ton PM2.5/2018	0.002079294	ton PM2.5/2018	ton PM2.5/2019

Activity	Equipment	Daily Activity Level	Total Activity Level	PM10 Emission Factor (lb/activity)	PM2.5 Emission Factor (lb/activity)	Uncontrolled PM10 (lb/day)	Uncontrolled PM2.5 (lb/day)	Controlled[1] Daily PM_{10} (lbs/day)	Controlled[1] Daily $PM_{2.5}$ (lbs/day)	Uncontrolled PM10 (tons/2018)	Uncontrolled PM2.5 (tons/2018)	Controlled[1] Daily PM10 (tons/2018)	Controlled[1] Daily PM2.5 (tons/2018)
Backhoe to Spread Spoils	1	5	5.0	0.75	0.41	3.76	2.07	1.47	0.81	0.40	0.22	0.15	0.08
Loader to Spread Spoils	1	6	6.0	0.75	0.41	4.52	2.49	1.76	0.97	0.47	0.26	0.18	0.10
					Total	8.28	4.56	3.23	1.78	0.87	0.48	0.34	0.19

Note: Assumed Backhoe and Loader used for these purposes.
[1] Control efficiency from watering twice daily (55%), from Table XI-A, XI-D Mitigation Measure Examples. (SCAQMD = 0.61

ACTIVITY 3
Excavating/Stockpiling associated with...
Underground Pipelines, Trenching

Info from PD: 20 feet (wide)
400 feet per day (lengt



6-11 feet (deep) 8.5 feet (avg)
6 feet (at bottom)

44200 cu ft/day
1637.037037 cu yd/day

Emission Factors for Excavation/Stockpiling

PM10 0.003129615 lb/cu yd (soil)
PM2.5 0.000473913 lb/cu yd (soil)

Emissions Estimates

			Controlled				Controlled				Controlled	
PM10	5.123295216	lb/day	1.99808513	lb/day (excavation)	0.1075892	ton PM10/2018	0.041959788	ton PM10/2018	0.268972999	ton PM10/2019	0.10489947	ton PM10/2019
PM2.5	0.775813276	lb/day	0.30256718	lb/day (excavation)	0.016292079	ton PM2.5/2018	0.006353911	ton PM2.5/2018	0.040730197	ton PM2.5/2019	0.015884777	ton PM2.5/2019

Activity	Equipment	Daily Activity Level	Total Activity Level	PM10 Emission Factor (lb/activity)	PM2.5 Emission Factor (lb/activity)	Uncontrolled PM10 (lb/day)	Uncontrolled PM2.5 (lb/day)	Controlled[1] Daily PM_{10} (lbs/day)	Controlled[1] Daily $PM_{2.5}$ (lbs/day)	Uncontrolled PM10 (tons/2018)	Uncontrolled PM2.5 (tons/2018)	Controlled[1] Daily PM10 (tons/2018)	Controlled[1] Daily PM2.5 (tons/2018)	Uncontrolled PM10 (tons/2019)	Uncontrolled PM2.5 (tons/2019)	Controlled[1] Daily PM10 (tons/2019)	Controlled[1] Daily PM2.5 (tons/2019)
Belly scraper to Spread Excess Spoils/Create Berms	1	4	4.0	0.75	0.41	3.01	1.66	1.17	0.65	0.06	0.03	0.02	0.01	0.16	0.09	0.06	0.03
Grader to Spread Excess Spoils/Create Berms	1	6	6.0	0.75	0.41	4.52	2.49	1.76	0.97	0.09	0.05	0.04	0.02	0.24	0.13	0.09	0.05
					Total	7.53	4.15	2.94	1.62	0.16	0.09	0.06	0.03	0.40	0.22	0.15	0.08

Note: Assumed Belly Scraper and Grader used for these purposes.
[1] Control efficiency from watering twice daily (55%), from Table XI-A, XI-D Mitigation Measure Examples. (SCAQMD = 0.61

AVEK HDWB
Surface Coating of 250,000 gal Storage Tank

Assume dimensions, as follows:	257000	http://www.rmf-slc.com/RMFTankCapChart-TankSizes.pdf	
Diameter (ft)	37	chk:	
Height (ft)	32	34406.72	cu ft
		7.48	gal/cu ft
		257362.3	gal

Surface area:

https://www.tnemec.com/company/resource/document/?doc=381

Roof and Framing Area =	1.22 x diameter^2	1670.18	
Shell Area =	3.1416 x diameter x height	3719.646	
TOTAL		5390	sq ft
	EF_{AC} (from below) =	0.011579	lb/sq ft
TOTAL VOC Emissions =	2 x TOTAL sq ft x EF_{AC} =	124.8235	lb VOCs
	where, C_{VOC} =	250	g/L (for Rust Preventative Coatings from AVAQMD Rule 1113)

https://www.arb.ca.gov/DRDB/AV/CURHTML/R1113.PDF

As taken from: Appendix A Calculation Details from CalEEMod (p. 28)
http://www.caleemod.com/

Assuming that all surface coating is completed in... 5 days

DAILY VOC Emissions = 24.9647 lb VOCs/day

AVEK HDWB
Fugitive Dust - Unpaved Roads

		On-Site Construction Motor Vehicle Fugitive Particulate Matter Emissions																					
		Vehicle Type	Daily Trips		Trip Distance (one-way), miles	Surface Type	Silt Loading (g/m^2)/ Silt Content (%)[a]	Vehicle Weight (tons)	Uncontrolled Emission Factors (lb/mi)[b]		Uncontrolled Emissions (lb/day)[c]		Uncontrolled Emissions (ton/2018)[c]		Uncontrolled Emissions (ton/2019)[c]		Control Efficiency[d]	Controlled Emissions (lb/day)[e]		Controlled Emissions (ton/2018)[c]		Controlled Emissions (ton/2019)[c]	
									PM10	PM2.5	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5		PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
1	Monitoring Wells (Installation)	Worker/Pick up Truck			3.00	Unpaved	4.3	2.4	0.58	0.05	0.0	0.0	0.0	0.0			81%	-	-	0.0	0.0		
2	Aqueduct Turnout, Construction	Worker/Pick up Truck			3.00	Unpaved	4.3	2.4	0.58	0.05	0.0	0.0	0.0	0.0			81%	-	-	0.0	0.0		
3	Underground Pipelines, Trenching	Worker/Pick up Truck			3.00	Unpaved	4.3	2.4	0.58	0.05	0.0	0.0	0.0	0.0	0.0	0.0	81%	-	-	0.0	0.0	0.0	0.0
4	Recharge Basin, Grading, and Above-ground Pipeline, I	Worker/Pick up Truck			3.00	Unpaved	4.3	2.4	0.58	0.05	0.0	0.0			0.0	0.0	81%	-	-			0.0	0.0
5	Extraction Wells, Installation	Worker/Pick up Truck	60		3.00	Unpaved	4.3	2.4	0.58	0.05	103.8	8.7	15.6	1.3	15.6	1.3	81%	20.1	1.7	3.0	0.3	3.0	0.3
6	Booster Pump Station, Construction, and Water Storag	Worker/Pick up Truck			3.00	Unpaved	4.3	2.4	0.58	0.05	0.0	0.0			0.0	0.0	81%	-	-			0.0	0.0

Since all overlapping groups include Activity 5, emissions associated with the maximum 30 employee roundtrips were calculated there. PM emissions include onsite & offsite travel.

		On-Site Construction Motor Vehicle Fugitive Particulate Matter Emissions																					
		Vehicle Type	Daily Trips	Total Trips	Trip Distance (one-way), miles	Surface Type	Silt Loading (g/m^2)/ Silt Content (%)[a]	Vehicle Weight (tons)	Uncontrolled Emission Factors (lb/mi)[b]		Uncontrolled Emissions (lb/day)[c]		Uncontrolled Emissions (ton/2018)[c]		Uncontrolled Emissions (ton/2019)[c]		Control Efficiency[d]	Controlled Emissions (lb/day)[e]		Controlled Emissions (ton/2018)[c]		Controlled Emissions (ton/2019)[c]	
									PM10	PM2.5	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5		PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
1	Monitoring Wells (Installation)	Delivery Trucks	4	20	3.00	Unpaved	4.3	14.75	1.43	0.12	17.2	1.4	0.0	0.0			81%	3.3	0.3	0.0	0.0		
2	Aqueduct Turnout, Construction	Delivery Trucks	12	24	3.00	Unpaved	4.3	14.75	1.43	0.12	51.5	4.3	0.1	0.0			81%	10.0	0.8	0.0	0.0		
3	Underground Pipelines, Trenching	Delivery Trucks	4	360	3.00	Unpaved	4.3	14.75	1.43	0.12	17.2	1.4	0.2	0.0	0.6	0.0	81%	3.3	0.3	0.0	0.0	0.1	0.0
4	Recharge Basin, Grading, and Above-ground Pipeline, I	Delivery Trucks	0	0	3.00	Unpaved	4.3	14.75	1.43	0.12	0.0	0.0			0.0	0.0	81%	-	-			0.0	0.0
5	Extraction Wells, Installation	Delivery Trucks	12	384	3.00	Unpaved	4.3	14.75	1.43	0.12	51.5	4.3	0.5	0.0	0.3	0.0	81%	10.0	0.8	0.1	0.0	0.1	0.0
6	Booster Pump Station, Construction, and Water Storag	Delivery Trucks	16	72	3.00	Unpaved	4.3	14.75	1.43	0.12	68.6	5.7			0.2	0.0	81%	13.3	1.1			0.0	0.0

Note: Totals may not match sum of individual values because of rounding.

[a] Unpaved surface silt content from USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations

[b] Equations:

EF (unpaved) = k_u $(s/12)^a$ $(W/3)^b$ Ref: AP-42, Section 13.2.2, "Unpaved Roads," November 2006

Constants:

k_u =	1.8	(Particle size multiplier for PM)
	0.15	(Particle size multiplier for PM2.5)
a =	1	for PM10
	1	for PM2.5
b =	0.5	for PM10
	0.5	for PM2.5

[c] Uncontrolled emissions [lb/day] = Emission factor [lb/mi] x Number x Daily miles traveled [mi/vehicle-day]

[d] Control efficiency from watering unpaved road twice a day (55%) and limiting maximum speed to 15 mph (57%), from Table XI-A, Mitigation Measure Examples, Fugitive Dust from Construction & Demolition, http://www.aqmd.gov/ceqa/handbook/mitigation/fugitive/MM_fugitive.html

[e] Controlled emissions [lb/day] = Uncontrolled emissions [lb/day] x (1 - Control efficiency [%])

Variable	Value	Description
W	2.4	average weight (tons) of worker vehicles (2.4 tons)
W	14.75	delivery/haul truck tons

		On-Site Operational Motor Vehicle Fugitive Particulate Matter Emissions												
		Vehicle Type	Daily Trips		Trip Distance (one-way), miles	Surface Type	Silt Loading (g/m^2)/ Silt Content (%)[a]	Vehicle Weight (tons)	Uncontrolled Emission Factors (lb/mi)[b]		Uncontrolled Emissions (lb/day)[c]		ANNUAL Uncontrolled Emissions (tons/year)	
									PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
4	Recharge Basin, Grading, and Above-ground Pipeline, I	Worker/Pick up Truck	4		3.00	Unpaved	4.3	2.4	0.58	0.05	6.9	0.6	0.9	0.1

AVEK HDWB

Fugitive Dust Emission Factors

Truck Loading Fugitive Dust Emission Factors

$EF_D = k \times (0.0032) \times ((U/5)^{1.3})/((M/2)^{1.4})$

Variable	Amount	Units	
EF (PM_{10})	0.0025	lb/ton	
EF ($PM_{2.5}$)	0.00037	lb/ton	
k (PM_{10})	0.35	factor	
k ($PM_{2.5}$)	0.053	factor	
U (mean wind speed)	11.2	miles/hr	WRCC data for LANCASTER-WJ FOX FLD (Stn ID KWJF), 1996-2006, http://www.wrcc.dri.edu/htmlfiles/westwind.final.html
M (moisture content)	2.40	percent	USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations
Soil density (CalEEMod default)	1.26	tons/cy	
Rip rap density	2.23	tons/cy	
Derrick/Grouted stone density	1.96	tons/cy	

PM10 Emission Factor	0.0025	lb/ton	=	0.00313	lb/cy (soil)
PM2.5 Emission Factor	0.00037	lb/ton	=	0.000474	lb/cy (soil)

E (lbs) = EF (lb/ton) x TP (tons)

Bulldozing, Scraping and Grading

PM10 Emission Factor [lb/hr] = 0.75 x (silt content [%])$^{1.5}$ / (moisture)$^{1.4}$

PM2.5 Emission Factor [lb/hr] = 0.60 x (silt content [%])$^{1.2}$ / (moisture)$^{1.3}$

Reference: AP-42, Table 11.9-1, July 1998

Parameter	Value	Basis
Silt Content	6.9	USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations
Moisture	7.9	USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations

PM10 Emission Factor	0.75	lb/hr
PM2.5 Emission Factor	0.41	lb/hr

Emissions [pounds per day] = Controlled emission factor [pounds per hour] x Bulldozing, scraping or grading time [hours/day]

AVEK HDWB
Indirect Greenhouse Gas Emissions--Electrical Demand

Evaluated for a worst-case "wet year" when all extraction wells and booster pump station are used at maximum

Extraction well (single) demand	2,720,000	kilowatt hours (kWh) per year per well
No. of extraction wells	18	wells
Subtotal	48,960	megawatt hours (MWh) per year
Booster Pump Station Demand	2,380,000	kWh per year per station
Subtotal	2,380	MWh per year
TOTAL Power Demand	51,340	MWh per year
SCE Carbon Intensity	0.23	metric tons CO2e per MWh
	11,808	metric tons CO2e per year
	13,016	tons CO2e per year
	71,322	lbs CO2e per day

(as reported in Edison International's 2015 Corporate Responsibility Report https://www.sce.com/wps/wcm/connect/c0fceef5-e04a-4287-8301-8e66e3e5fbac/2015-eix-corporate-responsibility-report.pdf?MOD=AJPERES&ContentCache=NONE

Using,	1.102311	tons / metric ton
Using,	2000	pounds / ton (lbs/ton)
	365	days / year

Indirect GHG Emissions			**AVAQMD CO2e Significance Threshold**		**Less than Significant?**
Annual	13,016	tons CO2e per year			
Daily	71,322	lbs CO2e per day	548,000	lbs CO2e per day	YES

CalEEMod
Equipment HP and Load Factors

OFFROAD Equipment Type	Horsepower	Load Factor
Aerial Lifts	63	0.31
Air Compressors	78	0.48
Bore/Drill Rigs	221	0.50
Cement and Mortar Mixers	9	0.56
Concrete/Industrial Saws	81	0.73
Cranes	231	0.29
Crawler Tractors	212	0.43
Crushing/Proc. Equipment	85	0.78
Dumpers/Tenders	16	0.38
Excavators	158	0.38
Forklifts	89	0.201
Generator Sets	84	0.74
Graders	187	0.41
Off-Highway Tractors	124	0.44
Off-Highway Trucks	402	0.38
Other Construction Equipment	171	0.42
Other General Industrial Equipmen	88	0.34
Other Material Handling Equipmen	168	0.40
Pavers	130	0.42
Paving Equipment	132	0.36
Plate Compactors	8	0.43
Pressure Washers	13	0.3
Pumps	84	0.74
Rollers	80	0.38
Rough Terrain Forklifts	100	0.40
Rubber Tired Dozers	247	0.4
Rubber Tired Loaders	203	0.36
Scrapers	367	0.48
Signal Boards	6	0.82
Skid Steer Loaders	65	0.37
Surfacing Equipment	263	0.30
Sweepers/Scrubbers	64	0.46
Tractors/Loaders/Backhoes	97	0.37
Trenchers	78	0.50
Welders	46	0.45

Tier Emission Factors

	Low HP	High HP	ROG(g/bhp	CO(g/bhp-h	NOX(g/bhp	PM10(g/bh	PM2.5(g/bhp-hr)
Tier 1	25	49	1.74	4.1	5.26	0.48	0.48
Tier 1	50	74	1.19	6.9	6.54	0.552	0.552
Tier 1	75	119	1.19	6.9	6.54	0.552	0.552
Tier 1	120	174	0.82	6.9	6.54	0.274	0.274
Tier 1	175	299	0.38	6.9	5.93	0.108	0.108
Tier 1	300	599	0.38	6.9	5.93	0.108	0.108
Tier 1	600	750	0.38	6.9	5.93	0.108	0.108
Tier 1	751	2000	0.38	6.9	5.93	0.108	0.108
Tier 2	25	49	0.29	4.1	4.63	0.28	0.28
Tier 2	50	74	0.23	3.7	4.75	0.192	0.192
Tier 2	75	119	0.23	3.7	4.75	0.192	0.192
Tier 2	120	174	0.19	3.7	4.17	0.128	0.128
Tier 2	175	299	0.12	2.6	4.15	0.088	0.088
Tier 2	300	599	0.12	2.6	3.79	0.088	0.088
Tier 2	600	750	0.12	2.6	3.79	0.088	0.088
Tier 2	751	2000	0.12	2.6	3.79	0.088	0.088
Tier 3	25	49	0.29	4.1	4.63	0.28	0.28
Tier 3	50	74	0.12	3.7	2.74	0.192	0.192
Tier 3	75	119	0.12	3.7	2.74	0.192	0.192
Tier 3	120	174	0.12	3.7	2.32	0.112	0.112
Tier 3	175	299	0.12	2.6	2.32	0.088	0.088
Tier 3	300	599	0.12	2.6	2.32	0.088	0.088
Tier 3	600	750	0.12	2.6	2.32	0.088	0.088
Tier 3	751	2000	0.12	2.6	2.32	0.088	0.088
Tier 4 Inter	25	49	0.12	4.1	4.55	0.128	0.128
Tier 4 Inter	50	74	0.12	3.7	2.74	0.112	0.112
Tier 4 Inter	75	119	0.11	3.7	2.14	0.008	0.008
Tier 4 Inter	120	174	0.06	3.7	2.15	0.008	0.008
Tier 4 Inter	175	299	0.08	2.6	1.29	0.008	0.008
Tier 4 Inter	300	599	0.08	2.6	1.29	0.008	0.008
Tier 4 Inter	600	750	0.08	2.6	1.29	0.008	0.008
Tier 4 Inter	751	2000	0.12	2.6	2.24	0.048	0.048
Tier 4	25	49	0.12	4.1	2.75	0.008	0.008
Tier 4	50	74	0.12	3.7	2.74	0.008	0.008
Tier 4	75	119	0.06	3.7	0.26	0.008	0.008
Tier 4	120	174	0.06	3.7	0.26	0.008	0.008
Tier 4	175	299	0.06	2.2	0.26	0.008	0.008
Tier 4	300	599	0.06	2.2	0.26	0.008	0.008
Tier 4	600	750	0.06	2.2	0.26	0.008	0.008
Tier 4	751	2000	0.06	2.6	2.24	0.016	0.016

EMFAC2014 (v1.0.7) Emission Rates
Region Type: Air District
Region: Antelope Valley AQMD
Calendar Year: 2018
Season: Annual
Vehicle Classification: EMFAC2011 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vehicle/day for IDLEX, RESTL and DIURN

Region	CalYr	VehClass	MdlYr	Speed	Fuel	ROG_RUNI	CO_RUNEX	NOx_RUNI	CO2_RUNI	PM10_RUI	PM10_PM	PM10_PM	PM10_TOT	PM2_5_RU	PM2_5_PM	PM2_5_PM	PM2_5_TOTAL
Antelope \	2018	LDA	Aggregate	Aggregate	GAS	0.023284	1.026622	0.091116	315.8194	0.002011	0.008	0.03675	0.046761	0.00185	0.002	0.01575	0.0196
Antelope \	2018	LDA	Aggregate	Aggregate	DSL	0.038413	0.365969	0.208538	288.8289	0.022387	0.008	0.03675	0.067137	0.021419	0.002	0.01575	0.039169
Antelope \	2018	LDT1	Aggregate	Aggregate	GAS	0.077154	2.980738	0.293228	372.4309	0.004458	0.008	0.03675	0.049208	0.004104	0.002	0.01575	0.021854
Antelope \	2018	LDT1	Aggregate	Aggregate	DSL	0.210881	1.139992	1.3342	401.683	0.190334	0.008	0.03675	0.235084	0.182101	0.002	0.01575	0.199851
Antelope \	2018	LDT2	Aggregate	Aggregate	GAS	0.032849	1.41329	0.161761	424.1533	0.002071	0.008	0.03675	0.046821	0.001906	0.002	0.01575	0.019656
Antelope \	2018	LDT2	Aggregate	Aggregate	DSL	0.022848	0.185704	0.093511	356.7466	0.007399	0.008	0.03675	0.052149	0.007078	0.002	0.01575	0.024828
Antelope \	2018	LHD1	Aggregate	Aggregate	GAS	0.092302	2.347026	0.536232	735.4692	0.001944	0.008	0.07644	0.086384	0.001791	0.002	0.03276	0.036551
Antelope \	2018	LHD1	Aggregate	Aggregate	DSL	0.145547	0.880572	5.061551	500.5281	0.031988	0.012	0.07644	0.120428	0.030604	0.003	0.03276	0.066364
Antelope \	2018	LHD2	Aggregate	Aggregate	GAS	0.039982	1.018944	0.311807	801.3365	0.001224	0.008	0.08918	0.098404	0.001126	0.002	0.03822	0.041346
Antelope \	2018	LHD2	Aggregate	Aggregate	DSL	0.11054	0.648174	3.506033	549.8583	0.024844	0.012	0.08918	0.126024	0.023769	0.003	0.03822	0.064989
Antelope \	2018	T7 tractor	Aggregate	Aggregate	DSL	0.159351	0.611721	5.52645	1628.401	0.026685	0.036	0.06174	0.124425	0.025531	0.009	0.02646	0.060991

Construction/Operational Workers	EMFAC	0.067571	1.185386	0.363726	359.9437	0.08286	0.05416
Water/Delivery Trucks	T7 Tractor	0.159351	0.611721	5.52645	1628.401	0.124425	0.060991

Appendix D: Biological Technical Report

Prepared for:
Antelope Valley-East Kern Water Agency

Prepared by:
AECOM
2400 Professional Parkway
Santa Maria, CA
Project # 60537613
September 2017

Antelope Valley-East Kern Water Agency

High Desert Water Bank Project

Revised Biological Technical Report

Prepared for:
Antelope Valley-East Kern Water Agency

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AECOM
2400 Professional Parkway
Santa Maria, CA
Project # 60537613
September 2017

Antelope Valley-East Kern Water Agency

High Desert Water Bank Project

Revised Biological Technical Report

Wynter K. Dawson

Prepared By Wynter Dawson

Wayne Vogler

Reviewed By Wayne Vogler

AECOM

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Acronyms and Abbreviations

AECOM	AECOM Technical Services, Inc.
AVEK	Antelope Valley-East Kern Water Agency
BCC	Bird of Conservation Concern
BCR	Bird Conservation Region
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CFGC	California Fish and Game Code
C.F.R.	Code of Federal Regulations
cfs	Cubic feet per second
CNPS	California Native Plant Society
Corps	U.S. Army Corps of Engineers
County	County of Los Angeles
cy	Cubic yards
CNDDB	California Natural Diversity Database
CWA	Clean Water Act
ECA	Essential Connectivity Area
EPA	Environmental Protection Act
ESA	Endangered Species Act
FR	Federal Register
ft	Feet
ft^2	Square feet
gpm	Gallons per minute
GPS	Global Positioning System
HCP	Habitat Conservation Plan
MBTA	Migratory Bird Treaty Act
msl	Mean sea level
NHD	National Hydrography Database
NWI	National Wetlands Inventory
OHWM	Ordinary High Water Mark
Project	High Desert Water Bank
RPR	Rare Plant Rank
RWQCB	Regional Water Quality Control Board
SEA	Significant Ecological Area
SWP	State Water Project
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1.0 Introduction and Background

The Antelope Valley East-Kern Water Agency (AVEK) proposes to construct and operate a groundwater recharge and recovery facility located in an unincorporated area of northwestern Los Angeles County, California (Figure 1). The proposed High Desert Water Bank (Project) includes construction of a 280,000 acre foot groundwater bank that will recharge the existing aquifer using State of California State Water Project (SWP) water. Operations will include year-round recharge activities during wet years and year-round recovery activities during dry years. Facilities will include construction of necessary aboveground pipelines associated with recharge activities, and groundwater extraction wells and pipelines associated with recovery activities. Recharge and recovery activities are anticipated to have a capacity of up to approximately 70,000 acre feet per year, as supply and demand warrant.

AVEK is a State Water Contractor that provides water to portions of northern Los Angeles and southeastern Kern counties. Previous assessments conducted by AVEK determined that the region lacks sufficient water storage facilities south of the Tehachapi Mountains, and that there is a critical and immediate need for groundwater storage in the region; the proposed Project aims to address this need. The proposed Project would store excess SWP water from State Water Contractors and other partnering agencies throughout the State of California, including AVEK, during wet years for later recovery, allowing AVEK and its partners to rely primarily on the groundwater bank as their primary water source during dry years.

The *High Desert Water Bank Project Biological Technical Report* (AECOM 2017) was prepared in May 2017 in support of the Initial Study (IS) for the Project. A Draft Mitigated Negative Declaration (MND; SCH No. 2017061030) for the Project was released on June 6, 2017. In response to the Draft MND and IS, AVEK received comments from the California Department Fish and Wildlife (CDFW) in a letter dated July 13, 2017, regarding concerns about sensitive natural resources on the Project site. Specifically, the CDFW requested additional surveys and analysis regarding impacts to special-status plant species, Swainson's hawk (*Buteo swainsoni*), desert tortoise (*Gopherus agassizii*), tricolored blackbird (*Ageliaus tricolor*), and CDFW-jurisdictional streambeds and wetlands. The CDFW also expressed concern about habitat loss due to construction and operations of the proposed Project. In response to these concerns, AVEK modified the Project plan to include habitat management lands, and issued a revised IS and Draft MND. This *High Desert Water Bank Project Revised Biological Technical Report* has been revised to include analysis and mitigation measures in response to CDFW concerns and with consideration of the Project plan modifications, in support of the revised IS.

AECOM Technical Services, Inc. (AECOM) prepared this biological technical report at the request of AVEK to document the biological resources present within the Project site. This report includes discussion of the special-status plant and wildlife species and sensitive habitats that may be subject to direct and indirect impacts as a result of implementation of the proposed Project, and is intended to support and inform permitting efforts for the proposed Project.

1.1 Project Location

The Project is located on approximately 1,500 acres in an unincorporated area of northwestern Los Angeles County, California, approximately 2 miles northwest of the community of Neenach, California, and 27 miles northwest of Lancaster, California (Figure 1). The proposed Project is bounded by Avenue A (Kern/Los Angeles County line) to the north, 280th Street West to the east, the California Aqueduct to the south, and 300th Street West to the west. It occurs within the La Liebre Ranch 7.5-minute U.S. Geological Survey (USGS) quadrangle, and encompasses Sections 1, 2, 11, and 12 of Township 8 North, Range 17 West. The site is largely undeveloped, consisting of fallowed agricultural lands and native and non-native herbaceous and scrub habitats, with a few isolated residential properties on and immediately east of the site. An existing groundwater bank owned and operated by another agency is located immediately north of the proposed Project.

1.2 Project Description

AVEK proposes to construct a new groundwater recharge and recovery facility on a largely undeveloped site immediately north of the California Aqueduct (Figure 2) to support groundwater recharge and recovery activities. The proposed Project will include construction of a 280,000 acre-feet groundwater bank that will store SWP water from various State Water Contractors and other partnering agencies, including AVEK. The Project proposes to store approximately 70,000 acre-feet of SWP surface water conveyed via the California Aqueduct per year during wet years when SWP allocations exceed demands. During dry and critical weather years when SWP allocations are low or disrupted and demand exceeds supply, the proposed Project will recover up to approximately 70,000 acre feet of stored water per year.

Specifically, the proposed Project includes installation or construction of the following components within the 1,500-acre site:

- Groundwater recharge basins on approximately 1,200 acres of the site
- One 70-inch diameter, 150 cubic feet per second (cfs) turnout from the California Aqueduct and rehabilitation of one existing 50 cfs turnout
- Approximately 3.5 miles of 36- to 70-inch diameter buried bi-directional pipelines
- Approximately 8 miles of 12- to 48-inch diameter temporary aboveground pipelines
- Approximately 6 miles of 12- to 48-inch diameter buried well collection pipelines
- Five new groundwater level monitoring wells
- Approximately 18 groundwater extraction wells with estimated yield of 2,500 gallons per minute
- Booster pump station with 100 cfs capacity and one 250,000-gallon storage tank

1.2.1 Groundwater Recharge

As discussed, the proposed Project includes plans for year-round groundwater recharge operations in wet years when SWP water is available. Water for recharge activities will be collected from the California Aqueduct located adjacent to the Project site, and distributed to the recharge areas via a new 70-inch turnout with an approximate capacity of 150 cfs. The turnout will occupy approximately 2 acres of land. An existing 50 cfs turnout will be rehabilitated as part of the proposed Project to assist in water distribution.

From the turnout, water will be conveyed throughout the site via a combination/bi-directional recharge and recovery pipeline network (Main) approximately 3.5 miles in total length. The Main pipeline will be laid at a depth of approximately 4 feet below ground surface via open trenching. The Main pipeline will include a number of connections to an 8-mile network of 12- to 48-inch diameter one-way aboveground pipelines, which will deliver water to the recharge basins.

Groundwater recharge may be accomplished through three methods, as described below.

1. **Shallow Earthen Berms.** Water may be flooded evenly throughout the site, using shallow earthen berms 3 feet or less in height to create recharge areas. This method is similar to agricultural operations where contour flooding is used with shallow earthen berms. This is the preferred method; equipment requirements and estimates of disturbance are based on the assumption that shallow earthen berms will be the method utilized to create recharge basins. Berms will be constructed at approximately 300-foot intervals throughout the site via

pushing earth with a tractor or backhoe; the proposed Project would require construction of approximately 40 miles of berms.

2. **Center Pivot.** Water may be spread out over the site using center pivot application/irrigation equipment. This method is similar to a row crop irrigation system.
3. **Engineered Basins.** Engineered basins may be constructed throughout the site. Water would be deposited into these basins at a depth of 5 to 10 feet.

Given the proposed recharge rate of up to 70,000 acre-feet of water per year, and an assumed recharge infiltration rate of 0.5 feet of water per day, the Project would require approximately 400 acres of recharge basins. Recharge rates are expected to naturally decrease over time; for this reason, the proposed Project includes construction of recharge basins encompassing approximately 1, 166 acres of the 1,400 acre site, with recharge activities to be cycled throughout the site to maintain recharge efficiencies. Rotation of actively utilized basins is expected to occur on a quarterly (every three months) basis.

1.2.2 Groundwater Recovery

Groundwater recovery activities will be conducted year-round during dry years or any other time when one or more partners require water stored at the Project to be recovered and delivered for use. The proposed Project may recover up to 90 percent of the banked water at a rate of 70,000 acre-feet of water per year. The proposed Project includes installation of approximately 18 groundwater extraction wells capable of maintaining yields of 2,500 gallons per minute (gpm). Each extraction well will include a 100-foot by 100-foot concrete well pad and be approximately 500 feet in depth.

Recovered water will be transported from the extraction wells via approximately 6 miles of 12- to 48-inch diameter well collection pipelines, which connect to the combination/bi-directional Main pipeline. A 100-cfs booster pump station and approximately 250,000-gallon storage tank would be installed to collect recovered water prior to delivery to the California Aqueduct; the booster pump station and storage tank would be located on a concrete pad and would occupy an enclosed area of approximately 2 acres.

1.2.3 Groundwater Monitoring

The proposed Project includes the construction of five monitoring wells to measure and monitor groundwater levels. Monitoring wells will be drilled approximately 500 feet deep and constructed with 5-inch diameter well casing. Each monitoring well will include a 1,600 square foot (ft^2) concrete well pad.

1.2.4 Equipment

Project activities will be conducted using the following equipment for various tasks associated with the Project:

- One drilling rig
- One crane
- One hydraulic excavator
- Two backhoes
- One grader
- One belly scraper
- One small roller compactor
- One skip loader
- One wheeled loader
- Two water trucks
- Test pump
- Two wheeled loaders
- Two to three work trucks

All equipment will be staged within the Project disturbance footprint, on existing developed or disturbed areas, or on existing roadways. Construction is anticipated to occur over a period 24 months, with estimated work hours between 7:00 a.m. and 5:00 p.m. Monday through Friday.

1.2.5 Disturbance

Total permanent disturbance for the Project is estimated to be approximately 12.0 acres; these areas include well pads for the groundwater extraction and monitoring wells, aboveground pipelines, booster pump station and storage tank, and other associated Project infrastructure. An additional approximately 70 acres will be subject to temporary disturbance associated with excavations necessary for the installation of buried pipelines; the majority of this area is likely to occur within the recharge basins.

The recharge basins will encompass a total of approximately 1,200 acres of the Project site. Disturbance associated with the recharge basins will occur on an irregular, rotational, temporary basis. Temporary impacts associated with inundation will encompass an average of up to 400 acres of the recharge basins at any one time. These impacts are not expected to be continual due to the supply and demand nature of the groundwater recharge and recovery activities; at many times, it is expected that the basins will be dry.

Approximately 185,777 cubic yards (cy) of material will be excavated during installation of the proposed buried pipelines. Stockpiled materials will be used for backfill; no imported soils will be needed for fill. Excess stockpiled soils remaining following backfill will be utilized for construction of the earthen berms. An additional approximately 70,400 cy of material will be disturbed to construct the earthen berms. Earthen berms will be constructed via pushing and scraping existing soils; no imported soils will be required in berm construction.

1.2.6 Habitat Management Lands

The proposed Project also includes on-site habitat management lands encompassing approximately 322 acres of the 1,500-acre site. Habitat management lands will include undisturbed areas of native and naturalized habitats, as well as areas encompassing on-site waters features, and will provide foraging, sheltering, transitory, and breeding habitat for native wildlife and plant species. Details of the habitat management lands will be presented in a Habitat Management Lands Management Plan currently under development.

1.3 Study Area

For the purposes of the biological survey, the Study Area was defined as the proposed Project site plus an additional buffer of approximately 100 feet around the site boundary (Figure 2). The Study Area varies between approximately 2,935 feet and 2,970 feet (894-905 meters) above mean sea level (msl), and encompasses approximately 1,510 acres.

2.0 Regulatory Setting

Biological resources including special-status species, sensitive habitats, and wetlands and waterways, are protected by a number of federal, state, and local acts, statutes, and regulations. The following sections provide a brief overview of the regulations that may be applicable to the resources that occur within or adjacent to the proposed Project and their respective requirements. Permits or other authorizations that would be required under these regulations if impacts have potential to occur are noted where applicable.

2.1 Federal

The federal legislation and regulations that protect biological resources and may apply to the proposed Project include Endangered Species Act (ESA), the Migratory Bird Treaty Act (MBTA), and the Clean Water Act (CWA). This section briefly summarizes these legislative acts and regulations.

2.1.1 Endangered Species Act

The ESA (16 United States Code [U.S.C.] §1531-1544, 87 Stat. 884, as amended) provides for the conservation of federally-listed threatened and endangered species and their ecosystems. Section 9 of the ESA prohibits actions that result in the "take" of threatened and endangered species, without special exemption. Under the ESA, "take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct." "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. "Harass" is defined as intentional or negligent actions that create the likelihood of injury to listed species by annoying them to such an extent as to significantly disrupt normal behavioral patterns including, but not limited to, breeding, feeding, or sheltering (50 Code of Federal Regulations [CFR] §17.3).

"Incidental take" is defined as take that is incidental to (i.e., not the purpose of) the carrying out of an otherwise lawful activity. Sections 7 and 10 of the ESA contain provisions for allowing take that would otherwise be prohibited under Section 9. Section 7 requires federal agencies proposing to conduct, fund, or approve an action that may result in take of listed species to ensure that their actions, including issuing permits, do not jeopardize the continued existence of listed species or destroy or adversely modify critical habitat. Under Section 7, federal agencies must consult with the U.S. Fish and Wildlife Service (USFWS). The result of this formal consultation is either a biological opinion that includes a non-jeopardy determination and authorization for incidental take, or a jeopardy opinion prohibiting the incidental take. Section 10(a) of the ESA provides a method for permitting a state or private action (in the absence of a federal nexus) that may result in the incidental take of threatened or endangered species from an otherwise lawful activity. Under Section 10(a), the project proponent must provide USFWS with a Habitat Conservation Plan (HCP) for the affected species and publish notification of the application for a permit in the Federal Register.

The ESA also prohibits the adverse modification of designated critical habitat for listed species. Section 3(5)(A) of the ESA defines critical habitat as "(i) the specific areas within the geographical area occupied by the species on which are found those physical or biological features (I) essential to the conservation of the species, and (II) which may require special management considerations or protection; and (ii) specific areas outside of the geographical area occupied by the species upon a determination by the Secretary of Commerce or the Secretary of the Interior (Secretary) that such areas are essential for the conservation of the species."

There is no known federal nexus for the proposed Project; therefore, if the Project has the potential to adversely affect a federally-listed species or designated critical habitat unit, only Section 10 would apply. Formal consultation under

Section 10 may result in obtainment of take authorization for federally-listed species with potential to be impacted by actions carried out within the Study Area.

2.1.2 Migratory Bird Treaty Act

The MBTA of 1918 (16 U.S.C. §703-712) prohibits pursuing, hunting, killing, capturing, possessing, purchasing, bartering for, or transporting of native migratory birds listed under the MBTA, or any part, nest, or egg of any such bird unless allowed by another regulation adopted in accordance with the MBTA. The migratory bird species protected by the MBTA are published in 50 CFR 10.13 (USFWS 2013). The MBTA does not discriminate between live or dead birds, and grants full protection to any bird parts including feathers, eggs, and nests that are included on the published list. The USFWS has statutory authority and responsibility for enforcing the MBTA. Under the MBTA, the proposed Project would need to comply with the measures that would avoid or minimize effects to nesting migratory bird species included on the published list.

2.1.3 Clean Water Act – Section 404

Pursuant to Section 404 of the Clean Water Act (CWA), the U.S. Army Corps of Engineers (Corps) regulates the discharge of dredge and/or fill material into waters of the United States. Section 404 requires that any person proposing an activity that would discharge these materials must first obtain a permit from the Corps. For regulated activities in the project region, Section 404 Permits are issued by the Corps' Los Angeles District. The CWA stipulates that the Corps may not issue a Section 404 Permit if the proposed activity would be contrary to the public interest or would cause substantial degradation of the nation's waters, or if a less environmentally damaging practicable alternative exists, among other restrictions.

Waters of the U.S. generally include navigable waterways and wetlands adjacent to navigable waterways, non-navigable tributaries to navigable waterways, and wetlands adjacent to non-navigable waters that are contiguous with navigable waterways. Regulatory definitions of wetlands and waters of the U.S., as well as recent U.S. Supreme Court decisions affecting the interpretation of those definitions, are discussed below.

2.1.3.1 Waters of the United States Defined

The term "waters of the United States" is defined in regulations promulgated by the Corps and the U.S. Environmental Protection Agency (EPA) under the authority of the CWA in June 2015 (see 80 FR 37054). This recent regulatory definition supersedes the definition that had been in use previously, and incorporates direction from the *Solid Waste Agency of North Cook County v. United States Army Corps of Engineers* (2001) and *Rapanos v. United States* and *Carabell v. United States* (2006, consolidated) Supreme Court decisions. In summary, as currently defined, the term "waters of the United States" includes the following:

1. All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.
2. All interstate waters, including interstate wetlands.
3. The territorial seas.
4. All impoundments of waters otherwise identified as waters of the United States in items 1 through 3 above.
5. All tributaries, as defined at 40 CFR 230.3(s)(3)(iii), of waters identified in items 1 through 3 above.
6. All waters adjacent to waters identified in items 1 through 3 above, including wetlands, ponds, lakes, oxbows, impoundments, and similar waters.

7. Prairie potholes, Carolina bays and Delmarva bays, pocosins, western vernal pools, and Texas coastal prairie wetlands, where they are determined, on a case-specific basis, to have a significant nexus to waters identified in items 1 through 3 above [see 40 CFR 230.3(s)(1)(vii)(A) through (E)].
8. All waters located within the 100-year floodplain of waters identified in items 1 through 3 above and all waters located within 4,000 feet of the high tide line or ordinary high water mark of a water identified in items 1 through 5 above where they are determined on a case-specific basis to have a significant nexus to a water identified in items 1 through 3 above [see 40 CFR 230.3(s)(1)(viii)].

In water bodies lacking adjacent wetlands, the lateral extent of the Corps' jurisdiction is bounded by Ordinary High Water Mark (OHWM). The OHWM is defined at 33 CFR 328.3(e) as "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas." Where adjacent wetlands are present (see Section 2.1.1.2), CWA jurisdiction extends laterally to the landward edge of the adjacent wetlands. The upstream/downstream limit of CWA jurisdiction is the point beyond which the OHWM is no longer perceptible.

2.1.3.2 Wetlands Defined

Wetlands are defined in Corps regulations at 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, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." In 1987, the Corps published the Corps of Engineers *Wetland Delineation Manual* (Environmental Laboratory 1987) to guide its field personnel in determining jurisdictional wetland boundaries. In 2008, the Corps published the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Corps 2008) to complement the *Wetland Delineation Manual* in the southwestern U.S. The methods set forth in these documents involve the delineation of wetlands based on the presence of three wetland parameters: a predominance of hydrophytic vegetation, wetland hydrology, and hydric soils.

2.1.4 Clean Water Act – Section 401

Under Section 401 of the CWA, every applicant for a federal permit or license for an activity which may result in a discharge of dredge or fill material to a water body must obtain a state-issued Water Quality Certification that the proposed activity will comply with state water quality standards (i.e., beneficial uses, water quality objectives, and anti-degradation policy). In California, the State Water Resources Control Board (SWRCB) has delegated the responsibility for issuing Section 401 Certifications to nine Regional Water Quality Control Boards throughout the state. The Los Angeles RWQCB issues Section 401 Certifications for projects in Los Angeles County, where the Project is located.

A CWA Section 404 Permit is a federal permit subject to the terms of Section 401 as described above, and the Corps therefore cannot issue a Section 404 permit in the project region until the permit applicant also receives a Section 401 Certification from the RWQCB. Because Section 401 of the CWA is restricted to activities requiring a federal license or permit, this section does not apply to activities affecting waters outside federal jurisdiction, such as isolated, intrastate waters or those excluded from federal jurisdiction based on the significant nexus standard described in Section 2.1.3 above.

2.2 State

State regulations pertaining to biological resources and which may apply to the proposed Project include the Porter-Cologne Water Quality Control Act, the California Endangered Species Act (CESA) and California Fish and Game Code

(CFGC) Sections 1600-1616, 1900 et seq., 3503, 3511, 4700, 5050, and 5515. These regulations are described briefly below.

2.2.1 California Endangered Species Act

CFGC considers threatened and endangered species to be of ecological, educational, historical, recreational, esthetic, economic, and scientific value to the people of California. The State of California enacted the CESA of 1973 (CFGC Sections 2050-2115.5) to protect threatened and endangered species. The CESA prohibits take of any species that the California Fish and Game Commission determines to be threatened or endangered, and allows for take incidental to otherwise lawful development projects upon approval from California Department of Fish and Wildlife (CDFW). Under Section 2080 of the CFGC, "No person shall import into this state, export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the commission determines to be an endangered species or a threatened species, or attempt any of those acts, except as otherwise provided" in the CFGC.

Title 14, Section 670.2 of the California Code of Regulations (CCR), lists the subspecies and varieties of California native plants that are endangered or threatened (as defined by Section 2067 of the CFGC), and Section 670.5 lists the wildlife species and subspecies that are designated as threatened or endangered in California. California also has identified wildlife Species of Special Concern (SSC). Having been so designated, Species of Special Concern also are considered in resource planning and management. The "Rare" designation applies to plants only and includes those plants that are not threatened or endangered, but that could become eligible due to decreasing numbers or further restrictions to habitat. Title 14, Section 670.2 of the CCR lists the subspecies and varieties of California native plants that are considered rare (as defined by Section 1901 of the CFGC).

The CESA contains provisions to authorize take of California-listed rare, threatened, or endangered species under Section 2081 of the CFGC, through issuance of Incidental Take Permits (ITPs) or memorandums of understanding. Take must be deemed "incidental to an otherwise lawful activity." In most cases, the applicant must agree to mitigate proportionally to the impacts to identified species, implement protection measures for the affected species, and define the list of permitted/allowable activities. Any proposed impact to state-listed species within the proposed project area would require an ITP under CESA.

2.2.2 California Fish and Game Code 1600-1616

Pursuant to Sections 1600–1616 of the California Fish and Game Code, the CDFW regulates all diversions, obstructions, or substantial changes to the natural flow or bed, channel, or bank of any river, stream, or lake that supports fish or wildlife. In regulations promulgated by the CDFW at 14 CCR 1.72, a stream is defined 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." In practice, CDFW has interpreted the term "streambed" to encompass all portions of the bed, banks, and channel of any stream, including intermittent and ephemeral streams, extending laterally to the upland edge of riparian vegetation. In the case of watercourses with vegetated floodplains, this interpretation often results in a jurisdictional area that is much wider than the active channel of the stream. The upstream limit of CDFW jurisdiction is the point upstream at which there is no evidence of a defined bed and bank, and riparian vegetation is not present.

The CDFW jurisdiction within altered or artificial waterways is based on the value of those waterways to fish and other wildlife (CDFW 1994). Generally:

- Natural waterways that have been subsequently modified and which have the potential to contain fish, aquatic insects, and riparian vegetation will be treated as natural waterways.
- Artificial waterways that have acquired the physical attributes of natural stream courses and which have been viewed by the community as natural stream courses should be treated by CDFW as natural waterways.
- Artificial waterways without the attributes of natural waterways should generally not be subject to Fish and Game Code provisions.

Projects with potential to impact waters of the state must complete a Notification of Lake or Streambed Alteration and obtain an agreement issued by the CDFW.

2.2.3 California Fish and Game Code Sections 1900 et seq.

CFGC Section 1900 et seq. is known as the Native Plant Protection Act of 1977, and designates California rare, threatened, and endangered plant species. The purpose of this Act is to preserve, protect, and enhance endangered or rare native plants of California. Many species and subspecies of native plants in California are in danger of extinction because their habitats are threatened with destruction, drastic modification, or severe curtailment as a result of exploitation by commercial or other means, or due to disease or other factors. Title 14, Section 670.2 of the CCR lists the subspecies and varieties of California native plants that are endangered, threatened (as defined by CFGC Section 2067) or rare (as defined by CFGC Section 1901).

2.2.4 California Fish and Game Code Section 3503

CFGC Section 3503 protects California migratory birds by making it unlawful to take or possess any migratory non-game bird (or any part of such bird) as designated in the MBTA.

2.2.5 California Fish and Game Code Sections 3511, 4700, 5050, and 5515

CFGC Sections 3511, 4700, 5050, and 5515 specifically prohibit the take of wildlife species that are classified as “fully protected” in California, even if other CFGC sections provide for incidental take of the species.

2.2.6 Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (California Water Code, Division 7, Sections 13000-14958) provides for statewide coordination of water quality regulations. This act established the California State Water Resources Control Board as the statewide authority on water quality, and designated nine separate RWQCBs to oversee water quality on a day-to-day basis at the regional/local level. Proposed discharges of waste that would affect State waters (that are not federal waters) within or adjacent to the Study Area would require a Report of Waste Discharge from the RWQCB. The Project occurs within the jurisdiction of the Los Angeles RWQCB.

2.3 Special-status Species

For the purposes of determining presence of and assessing impacts to special-status species within this report, sensitive and special-status species are defined as species that are included in one or more of the following lists:

- Plant and wildlife species that are listed as threatened or endangered, or are candidates for listing as threatened or endangered, under the Federal Endangered Species Act.

- Plant and wildlife species that are listed as threatened or endangered, or are candidates for listing as threatened or endangered, under the California Endangered Species Act.
- CDFW-designated Species of Special Concern (CSC), Special Plants, Special Animals, and Rare plant species.
- CDFW-designated Fully Protected species.
- Plants designated by the California Native Plant Society (CNPS) with a California Rare Plant Rank (RPR) of 1, 2, and 4.
- Bird species listed as protected under the Migratory Bird Treaty Act (MBTA), or listed as Birds of Conservation Concern (BCC) by the USFWS.

3.0 Methodology

AECOM conducted a literature review and field surveys to determine whether sensitive biological resources, including sensitive habitats and special-status plant and wildlife species, occur or have potential to occur within the Study Area. The following sections describe the methodologies followed for the literature review and field survey.

3.1 Literature Review

Prior to conducting the field survey, AECOM reviewed the California Natural Diversity Database (CNDDB) for records of special-status species occurrences and sensitive habitats in the vicinity of the proposed Project (California Department of Fish and Wildlife [CDFW] 2017a). Parameters for the search included a 5-mile radius from all proposed Project components. AECOM also conducted a CNDDB search of the USGS 7.5-minute quadrangle containing the Project, the La Liebre Ranch quadrangle, and the eight adjacent quadrangles, including Pastoria Creek, Winter's Ridge, Liebre Twins, Lebec, Neenach School, Black Mountain, Liebre Mountain, and Burnt Peak quadrangles (USGS 2015). Extirpated records were excluded from further analysis.

Additionally, AECOM reviewed information from the USFWS and the CNPS sensitive species occurrence databases to compile a list of special-status plant and wildlife species that have the potential to occur within the Study Area and in its vicinity (USFWS 2017a, CNPS 2017). Data from the USFWS Critical Habitat Portal determined the extent of designated critical habitat units in the vicinity of the proposed Project (USFWS 2017b). The USGS National Hydrography Database (NHD) and USFWS National Wetland Inventory (NWI) were searched for potential wetland or waters features within or adjacent to the Study Area (USGS 2017; USFWS 2017c).

3.2 Field Survey

AECOM biologists Wynter Dawson and Sara Snyder conducted a reconnaissance-level biological survey and general habitat assessment of the Study Area on March 30 and 31, and April 4, 2017. The biological survey focused on documenting the presence of sensitive biological resources, including sensitive habitats, special-status wildlife species and their sign, and potentially suitable habitat for special-status species. General surveys were conducted by vehicle; pedestrian surveys via meandering transects were conducted in areas with poor vehicle access or high potential to contain sensitive habitats or other sensitive biological resources.

All plant species and wildlife species, including burrows and other sign (e.g., tracks, scat, remains, etc.), observed during the survey were recorded in field notes. Observations of special-status plant and wildlife species and their sign were recorded in field notes and locational data of each observation was taken using a Garmin 60CSx handheld Global Positioning System (GPS) unit or a mobile device GPS data collection program.

Potential wetland and waters features within the Study Area and in the immediate vicinity identified during the literature review were investigated to the extent feasible based on accessibility and assessed for habitat value based on presence or absence of water, substrate type, and type and density of bank and emergent vegetation. All features identified in the NWI within the Study Area were assessed; some features located in the vicinity of the Study Area could not be surveyed due to access restrictions. Potential wetland features within the Study Area that were small in size and regular in shape and/or contained surface waters were visually surveyed from the edges. Larger or irregularly shaped features were surveyed on foot via meandering transects with 100 percent coverage. Pedestrian surveys of the entire length of the two drainage features located within the Study Area were conducted to document flow patterns and assess potential jurisdictional criteria including vegetation, hydrology, soils, and physical structure.

Land cover types and vegetation communities within the Study Area were mapped in the field and later digitized. Primary use defined land cover types; dominant species present defined natural and naturalized vegetation

communities, following methodology provided in *A Manual of California Vegetation,* Second Edition (Sawyer and Keeler-Wolf 2009).

4.0 Results

The Study Area encompasses a largely undeveloped area previously used for agriculture and grazing; remnants of these activities remain observable at the site and on aerial photography. The majority of the Study Area is dominated by common herbaceous and scrub species, with limited areas of fallowed orchards. Plant and wildlife species observations were generally of common species, although two special-status bird species were observed. Appendix A includes a complete list of the plant and wildlife species observed within the Study Area. Appendix B includes representative photographs of the Study Area.

Desktop and field investigations were focused on identifying sensitive biological resources, including sensitive habitats and special-status plant and wildlife species, that occur or have potential to occur within or adjacent to the Study Area. The following sections describe the results of these investigations.

4.1 Literature Review

A review of the CNDDB identified records for 12 special-status plant and wildlife species with 5 miles of the Study Area, including two plant species, one invertebrate, two reptiles, five birds, and two mammals (Figure 8). The CNDDB also identified two CDFW-designated sensitive natural communities within a 5-mile radius of the Study Area. Three species have records within a 1 mile radius of the Study Area, including one invertebrate, one bird, and one mammal. No records occurred within the Study Area boundary.

A search of CNDDB records within the Study Area and adjacent 7.5-minute quadrangles identified records for 55 special-status plant and wildlife species (Figures 7b and 7c). Records included 19 plant species, three invertebrates, four amphibians, seven reptiles, 13 birds, and nine mammals. A total of 11 sensitive natural communities also were identified (Figure 7a). Extirpated records were excluded from analysis. Appendix C includes a summary analysis of the potential for each species to occur within the Study Area based on habitat requirements and range.

No designated critical habitats occur within the Study Area. The nearest designated critical habitat is the Tejon Ranch unit, one of nine units designated in 1977 for the California condor (*Gymnogyps californianus*) (USFWS 2017b). This unit occurs approximately 4 miles west of the Study Area and encompasses important foraging grounds for the California condor (41 FR 41914). No Project-related impacts to this or any other critical habitat are anticipated; therefore, critical habitat will not be discussed further herein.

4.2 Soils

Four soils types occur within the Study Area, including Hanford, Oakdale, and Oak Glen sandy loams, and Vernalis loams (Figure 3). These complexes are described briefly below.

4.2.1 Hanford Series Soils

Hanford series soils are very deep, well-drained soils that occur on stream bottoms, floodplains, and alluvial fans and generally have slopes of 0 to 15 percent. They are widely distributed throughout the San Joaquin Valley and in the valley of central and southern California. These soils form in deep, moderately coarse textured alluvium, typically from granite and other quartz-bearing rocks, and exhibit negligible to low run-off and moderately rapid permeability. Hanford series soils are used for growing a wide range of fruits, vegetation, and farm crops, as well as to support urban development and dairies. Native vegetation generally consists of annual grass and herbaceous species. Within the Study Area, Hanford series soils exhibit slopes of 0 to 2 percent and are located in a small area at the southeastern corner of the site (USDA-NRCS 2017).

4.2.2 Oakdale Series Soils

Oakdale series soils are very deep, well-drained soils that occur on nearly level to gently sloping alluvial fans and terraces and in slightly depressed stream channels and generally have slopes of 0 to 5 percent. These are non-extensive soils that are found primarily along the alluvial fans and terraces of the Stanislaus River in California. These soils form from coarse textured granitic alluvium and exhibit very slow to slow runoff and moderately rapid permeability. Oakdale series soils are almost exclusively cultivated and irrigated; common crops include grapes, almonds, peaches, alfalfa, beans, corn, and walnuts. Within the Study Area, Oakdale series soils exhibit slopes of 2 to 9 percent and are located within the northern third of the site (USDA-NRCS 2017).

4.2.3 Oak Glen Series Soils

Oak Glen series soils are deep, well-drained soils that occur on alluvial fans and toe slopes and generally have slopes of 2 to 25 percent. These are moderately extensive soils which occur in mountain valleys in southern California. Oak Glen series soils form in alluvium from a variety of rock sources, although granitic rock is the dominant source, and exhibit slow to rapid runoff and moderately rapid permeability. They are typically used for growing pasture or deciduous orchards, or for recreation in forested areas. Native vegetation consists of shrubland, mixed hardwood and coniferous forests, and naturalized grasses and forbs. Within the Study Area, Oak Glen series soils occur only within a small strip on the western side of the site and exhibit slopes of 2 to 9 percent (USDA-NRCS 2017).

4.2.4 Vernalis Series Soils

Vernalis series soils are very deep, well-drained soils that occur on alluvial fans and floodplains and generally have slopes of 0 to 5 percent. They are moderately extensive in the Central Valley and western portion of the Antelope Valley in California. These soils form in alluvium from mixed rock sources, and exhibit negligible to low run-off and moderate permeability. Vernalis series soils are typically used for growing irrigated crops, livestock grazing, and growing non-irrigated small grain crops. Native vegetation typically consists of annual grasses and forbs, as well as sagebrush and rabbitbrush (*Ericameria* sp.) scrub at higher elevations. Within the Study Area, Vernalis series soils exhibit slopes of 0 to 2 percent and occur throughout the southern two-thirds of the site (USDA-NRCS 2017).

4.3 Land Covers and Vegetation Communities within the Study Area

Three native or naturalized vegetation communities and two anthropogenic land cover types were identified within the Study Area. No sensitive natural communities were identified during the field survey. Figure 4 illustrates the vegetation communities and land covers throughout the Study Area. The following sections briefly describe these communities in more detail.

4.3.1 Developed

Developed areas within the proposed Project Area are limited and include existing residential structures and other buildings, existing pump stations and other pipeline infrastructure, and existing, well-travelled roads including 280th Street W, W Avenue A, 300th Street W, and the access road north of the California Aqueduct, as well as a few compacted dirt, frequently travelled roads through the Study Area. Smaller unpaved, in frequently used roads were included with the adjacent vegetation communities as they typically were vegetated for part or all of their length.

Development occurs in relatively small, isolated plots throughout the proposed Project Area (Figure 4). These areas are generally void of vegetation or, in the case of residential properties, have vegetation cover consistent with the adjacent areas. Development encompasses approximately 4.4 acres of the proposed Project Area.

4.3.2 Fallow Agriculture

Active and fallow agricultural parcels are common in the vicinity of the Study Area. Although the majority of the Study Area was utilized for grazing or row crop farming in the past, most of these areas have been recolonized by and now support native and non-native herbaceous vegetation. Within the Study Area, fallowed agricultural areas include only the abandoned peach (*Prunus persica*) orchards in the northwest portion of the Study Area. These areas consist of dead or mostly dead domestic peach trees with an overgrown herbaceous understory with species composition similar to the surrounding areas. Fiddlenecks (*Amsinckia* sp.) and non-native grasses including foxtail barley (*Hordeum murinum*), ripgut brome (*Bromus diandrus*), and redstem filarees (*Erodium cicutarium*) are common in the understory. Ripgut brome and foxtail barley are rated by the California Invasive Plant Council (Cal-IPC) as moderately invasive (Cal-IPC 2017). Fallow agriculture encompasses a total of approximately 68.9 acres.

4.3.3 Fiddleneck Fields

Fiddleneck fields (*Amsinckia menziesii/tessellata* Herbaceous Alliance) are characterized by seasonally co-dominant fiddlenecks (*Amsinckia* sp.) in the herbaceous layer. Emergent shrubs may be present at low cover. The herbaceous layer is less than 3.3 feet (1 meter) in height with an intermittent to continuous canopy. Fiddleneck fields occur on upland slopes, ocean bluffs, broad valleys, grazed or recently burned hills, and fallow fields. Soils are well-drained and loamy, and often are subject to high levels of bioturbation. Elevations range from sea level to 3,937 feet (1 to 1,200 meters) (Sawyer and Keeler-Wolf 2009).

Fiddleneck fields occur throughout the Study Area. The fiddleneck fields are generally dominated by common fiddlenecks (*Amsinckia intermedia*) and devil's lettuce (*Amsinckia tessellata*), with non-native grasses including ripgut brome, foxtail barley, and red brome (*Bromus madritensis*), filarees, and native wildflower species including Great Valley phacelia (*Phacelia ciliata*), California goldfields (*Lasthenia californica*), and cryptanthas (*Cryptantha* sp.) also present. Isolated rubber rabbitbrush (*Ericameria nauseosa*) may be present where fiddleneck fields start to integrate with rubber rabbitbrush scrub. Red brome is rated by the Cal-IPC as a highly invasive species (Cal-IPC 2017). Fiddleneck fields encompass a total of approximately 553.5 acres of the Study Area.

4.3.4 Non-native Annual Grassland

Non-native annual grasslands typical of the Study Area do not follow the membership rules of a recognized vegetation community in *The Manual of California Vegetation,* but are a modification of annual brome grassland (*Bromus diandrus/hordaceous* Semi-Natural Herbaceous Stands). The herbaceous layer is generally less than 3.3 feet (1 meter) in height. Annual brome grasslands occur on all topographic settings in foothills, waste, and previously disturbed areas, rangelands, and openings in woodlands, at elevations from sea level to 7,200 feet (0 to 2,200 meters) (Sawyer and Keeler-Wolf 2009).

Within the Study Area, non-native foxtail barley is dominant or co-dominant with ripgut brome and cheatgrass (*Bromus tectorum*) in the herbaceous layer. Other non-native grasses including red brome may be present, as well as native herbaceous species including fiddlenecks and Great Valley phacelia at lower cover. Isolated rubber rabbitbrush individuals also may be present at low cover. Non-native annual grasslands occur mostly in the eastern half of the Study Area, and encompass approximately 323.5 acres.

4.3.5 Rubber Rabbitbrush Scrub

Rubber rabbitbrush scrub (*Ericamera nauseosa* Shrubland Alliance) is characterized by dominant or co-dominant rubber rabbitbrush in the shrub canopy, with a sparse or grassy herbaceous layer. Emergent trees, usually junipers or pines, may be present at low cover. The shrub layer is less than 10 feet (3 meters) in height, with an open to continuous canopy. Rubber rabbitbrush scrub occurs in all topographic settings, especially in disturbed settings, on well-drained

sands and gravelly soils. Elevations range from sea level to 10,500 feet (0 to 3,200 meters) (Sawyer and Keeler-Wolf 2009).

Rubber rabbitbrush scrub occurs throughout the Study Area. Rubber rabbitbrush scrub within the Study Area generally exhibits an intermittent to dense herbaceous layer consisting of fiddlenecks, California goldfields, cryptanthas, owl's clover (*Castellija exserta*), California poppy (*Eschscholzia californica*), manroot (*Marah watsonii*), and non-native grasses including ripgut brome, red brome, and foxtail barley. Other shrub species including saltbush (*Atriplex* sp.), and bladderpod (*Peritoma arborea*) may occur at low cover. Rubber rabbitbrush scrub encompasses a total of approximately 562.7 acres of the Study Area.

4.4 Waters Features

A search of the NHD and NWI identified several potential waters and wetland features, including man-made retention basins, potential seasonal wetland features, and drainages, within or immediately adjacent to the Study Area (Figure 5). Field surveys investigated each of these features for their potential to provide aquatic habitat. The majority of these features consist of small, man-made retention basins formed by dirt berms, typically overgrown with herbaceous species. Two intermittent streams also occur within the Study Area. Only one feature, identified as Feature 1 in Figure 5, contained surface waters.

The NWI identified two features within the Study Area that were no longer extant. These included one man-made retention basin determined to have been destroyed sometime prior to 2004 based on aerial photography. Additionally, one seasonal wetland feature in the southern portion of the Study Area was no longer extant; no emergent or hydrophytic vegetation and no topographic depression were observed. Aerial photography showed signs of previous row crop farming within the area, and agriculture-related ground disturbance may have disrupted the feature. Features determined to be no longer extant were excluded from further analysis.

Numerous waters features also occur in the vicinity of the Study Area, consisting mostly of small, isolated man-made retention basins which hold surface waters temporarily during high precipitation events or to support agricultural or groundwater recharge activities. Additionally, the California Aqueduct occurs approximately 100 feet south of the Study Area and contains surface waters year-round. Features within the vicinity were investigated for habitat value to the extent feasible based on access limitations.

Man-made retention basins of varying sizes occur within the Study Area and on adjacent properties, including one basin encompassing approximately 1 acre within the Study Area and several north of Avenue A and east of 280th Street West (Figure 5). A series of basins north of Avenue A is part of an existing groundwater recharge bank. All of these basins and the basins on neighboring properties were void of surface waters and vegetated with upland species, primarily fiddlenecks, rubber rabbitbrush, black mustard (*Brassica nigra*), non-native grasses and filarees. Although these basins may contain surface waters during very short periods immediately following rain events, they are not expected to provide aquatic habitat and were treated as terrestrial habitats when determining Project-related impacts to waters features (Section 5.2).

4.4.1 Feature 1

A single, raised retention basin with approximately 5-foot tall dirt embankments is located along the southern edge of the Study Area, immediately north of the aqueduct crossing (Figure 5). This feature is relatively small, encompassing approximately 0.1 acres, and contained surface waters approximately 8-10 inches in depth during the field survey. The feature is fed by a buried discharge pipe at the northwest corner of the basin, which appears to originate at the pump station immediately west of the feature. Substrate and banks were of native soils. The slopes and top of the embankment were generally vegetated with upland species, including rubber rabbitbrush, black mustard, filarees, ripgut brome, foxtail barley, and bladderpod. Within the basin, several small narrowleaf willows (*Salix exigua*) were

present, and stands of cattails (*Typha* sp.) occurred within the open water portion of the feature. Narrowleaf willow is classified as a facultative wetland species, and cattail species are all obligate wetland species (Lichvar *et. al* 2017). The presence of hydrophytic vegetation indicates that waters are permanent or semi-permanent in this feature.

4.4.2 Feature 2

A potential seasonal wetland feature occurs at the southwest corner of the Study Area, adjacent to the northern fork of Drainage 1 (Figure 5). This feature consists of a shallow topographical depression with poorly defined edges. Although the feature was dry during the survey, soil cracking suggestive of surface water presence was evident. The majority of the feature is bare ground or consists of generally sparse vegetation, including non-native grasses, fiddlenecks, and rubber rabbitbrush; these species are more plentiful at the edges of the feature. This feature appears to gather waters from the adjacent scrub and as runoff from the nearby roads, and may be hydrologically linked to the drainage to the south during periods of sudden or high precipitation. At the downstream end of the drainage feature, waters appear to disperse into the rubber rabbitbrush scrub.

4.4.3 Drainage 1

An unnamed intermittent stream enters the Study Area at the southwest corner through a set of culverts that convey flows under 300th Street West. No waters were present during the field survey. Two pairs of culverts appear to contribute flows; the southern pair is approximately 12 inches in diameter each, and show direct hydrological linkage to the channel. Culverts in the northern pair are approximately 36 inches in diameter each, and open into a deep plunge pool that may overflow into the channel during high flow events. Flows are supplemented by roadway run-off, and during the wet season waters also may flow down through the seasonal wetland to the north, identified as Feature 2. From 300th Street W, flows are conveyed southwest roughly parallel to the unnamed access road north of the California Aqueduct. The channel alternates between wide, poorly defined, and well-vegetated with herbaceous species, and V-shaped with a predominantly bare ground channel bottom and vegetated banks. Flows cross over one existing road and disperse into upland scrub habitat at the downstream end of the drainage, with no apparent connection to other features.

Substrates throughout the drainage are native soils, consisting of loose sands and small gravel. Where vegetation occurs within the channel and on the banks, it consists of upland species dominated by rubber rabbitbrush in the shrub layer with non-native grasses, fiddlenecks, filarees, and other species common in the adjacent scrub and herbaceous habitats.

Drainage 1 is approximately 3,880 feet (0.73 miles) long through the Study Area, with an average width of 2 to 4 feet and a maximum width of approximately 8 feet. Channel depth averages from approximately 2 to 10 inches, with a maximum depth of 3 feet from top of bank.

4.4.4 Drainage 2

A second unnamed intermittent stream forms on the Study Area from overland flows and roadway run-off near the crossing of the California Aqueduct (Figure 5). No surface waters were present in the channel during the field survey. Flows enter an incised channel that has been stabilized with rip-rap and large stone, and continue northeast through an incised channel punctuated with several plunge pools. The channel decreases in depth and loses its defined banks as it continues northeast, becoming wide, poorly defined, and well-vegetated with upland species. The drainage is modified in several places, including areas where the channel has been filled in to build roadway crossings and flows pour over the road and enter the channel on the other side. At one point, flows appear to travel along an existing dirt roadway for approximately 920 feet, before crossing and continuing east as a wide, relatively flat channel across the grasslands. At the downstream end, flows from the grassland collect into a deep, wide, incised channel for the last 425 feet before

crossing 280th Street W and continuing east out of the Study Area, eventually connecting with an unnamed ephemeral drainage that conveys flows eastward before dispersing in the uplands.

Substrates throughout the drainage are native soils, consisting primarily of loose sands, sandy loams, and small gravel. Large stone, which appears to have been placed as energy dispersant, occurs at the headwaters. The channel tends to be unvegetated where it is incised, with upland vegetation on the banks; upland vegetation, especially non-native grasses, tends to dominate the channel where it is wide and shallow.

Drainage 2 is approximately 7,880 feet (1.49 miles) long through the Study Area, with an average width between 8 and 20 feet and a maximum width of over 50 feet where the channel widens into relative flat herbaceous alliance and grasslands. Channel depth, excluding plunge pools, averages from just a few inches to 4 feet, with a maximum depth of 7 feet at the downstream end.

4.5 Wildlife Observations

Wildlife observations were generally of common species typically associated with scrub and grassland habitats and common throughout the region, including western side-blotched lizard (*Uta stansburiana elegans*), western meadowlark (*Sturnella neglecta*), western kingbird (*Tyrannus verticalis*), common raven (*Corvus corax*), red-tailed hawk (*Buteo jamaicensis*), California quail (*Callipepla californica*), white-crowned sparrow (*Zonotrichia leucophrys*), and desert cottontail (*Sylvilagus audubonii*).

A flock of approximately 30 yellow-headed blackbirds (*Xanthacephalus xanthocephalus*) was observed at the northeast corner of the Study Area; this same species was observed in larger numbers immediately south of the California Aqueduct in a mixed flock with tricolor blackbirds (*Agelaius tricolor)*. Several dead panamint kangaroo rats (*Dipodomys panamintinus*) were observed along roadways within the Study Area, and kangaroo rat precincts were common throughout the Study Area. California ground squirrel (*Otospermophilus beecheyi*) colonies also were observed within and adjacent to the Study Area. Appendix A includes a complete list of wildlife species observed within the Study Area.

Two special-status bird species, loggerhead shrike (*Lanius ludovicianus*) and California horned lark (*Eremophila alpestris actia*), were observed. These species are discussed in more detail in Section 4.6.

4.6 Special-Status Species Observations

No special-status plant species were observed within or adjacent to the Study Area; special-status species observed included loggerhead shrike, a CDFW Species of Special Concern, and California horned lark, a CDFW Watch List species. These species are discussed in greater detail below. Special-status wildlife observations are depicted on Figure 6.

Section 4.7 discusses sensitive species with potential to occur based on historical occurrences in the vicinity and potentially suitable habitat within the Study Area.

4.6.1 California Horned Lark

The California horned lark is a CDFW-designated Watch List Species (CDFW 2017d). Horned larks are common to abundant year-round residents in a variety of open habitats in California, including grasslands and deserts, from sea level up to 13,000 feet (3,962 meters) in elevation. Although this species is numerous, worldwide declines from 1966 onward have resulted in a cumulative decline of 71 percent through 2015. Reasons for their decline are not well understood, but habitat loss due to development and reforestation, and human encroachment on their habitats may be factors (CDFW 2017b, Cornell Lab of Ornithology 2015).

Horned larks require dry, bare ground and habitats with low, sparse vegetation and an absence of tall trees and shrubs, including prairies, deserts, tundra, beaches, dunes, and heavily grazed pastures, as well as areas cleared by humans such as plowed fields and mowed expanses. Grasses should not be more than a few inches tall. They forage in pairs or

small flocks on the ground for seeds and insects, and may take crop seedlings. Horned larks are a ground nesting species, building a small basket cup of fine grass and other plant materials on bare ground (Cornell Lab of Ornithology 2015). Typically, three to four eggs are laid per clutch, and a pair may raise two clutches per season. Breeding occurs from March through July, with a peak in May (CDFW 2017b).

Horned larks were commonly observed throughout the fiddleneck fields and non-native grasslands within the Study Area. Although no nests were directly observed, the Study Area does contain potentially suitable nesting habitat for this species and breeding is expected to occur based on the number of individuals observed and the habitats present.

4.6.2 Loggerhead Shrike

The loggerhead shrike is a CDFW California Species of Special Concern (CDFW 2017d). The loggerhead shrike is a common resident and winter migrant in lowlands and foothills throughout California (CDFW 2017b). It ranges throughout the continental U.S. Although the species has declined sharply throughout most of its range, populations in the Pacific states have remained fairly stable. Population declines have been linked to increased use of pesticides, which not only limits prey availability but may kill birds through the ingestion of pesticide-laced prey. Collisions with vehicles, urban development, habitat alteration and destruction from land-use conversion and strip-mining, and altered prey populations as a result of livestock grazing also are believed to have contributed to their decline (Cornell Lab of Ornithology 2015).

Loggerhead shrikes are passerines that inhabit open habitats with scattered shrubs, trees, posts, fences, utility lines, and other perches. Suitable habitats include open-canopied valley foothill hardwood, valley foothill hardwood-conifer, valley foothill riparian, pinyon-juniper, juniper, desert riparian, and Joshua tree habitats, as well as open cropland and the edges of desert habitats (CDFW 2017b). Areas with short vegetation and shrubs and trees with spines or thorns are preferred. Loggerhead shrikes prey on insects and other arthropods, amphibians, reptiles, small mammals, and other birds. They hunt from a perch or while hovering, and often impale large prey items on thorns or barbed wire (Cornell Lab of Ornithology 2015). Breeding in California occurs from March through August; eggs are laid in an open cup nest built in a tree or shrub, with thorny vegetation favored for nesting sites (CDFW 2017b, Cornell Lab of Ornithology 2015).

Multiple loggerhead shrikes were observed within and at the edges of the Study Area. Both foraging and nest building behaviors were observed, and one in-construction nest was located in a saltbush within the Study Area (Figure 6). Appendix D contains CNDDB data forms for these observations. Given the suitability of habitat and observed nesting activity, the Study Area is expected to support successful breeding and year-round foraging by this species.

4.7 Sensitive Species Potentially Present in the Project Area

Field surveys combined with results of the literature review identified a total of seven special-status species that, although not observed, have potential to occur within the Study Area. Appendix C lists the special-status plant and wildlife species with potential to occur within the Study Area. Species in Appendix C determined to have low or no potential to occur within the Study Area are not discussed further in this report, with the exception of the desert tortoise (*Gopherus agassizii)*, which was given special consideration due to request from the CDFW.

4.7.1 Crotch Bumble bee

The Crotch bumble bee (*Bombus crotchii*) is a CDFW Special Animal that inhabits relatively warm, dry sites in southwestern California and southwest Nevada, near the California border. Historically, Crotch bumble bees were common throughout the Central Valley, but this species appears to have been extirpated through most of its range. Extensive agricultural activities and urban development are thought to be the primary causes for the decline of Crotch bumble bees. Climate change, pesticide use, pathogens from managed pollinators, and competition with introduced

bees also may be contributing factors (International Union for Conservation of Nature and Natural Resources [IUCN] 2017).

Crotch bumble bees are a short-tongued species that occurs in open grassland and scrub habitats where suitable food plants, including milkweed (*Asclepias* spp.), pincushion flowers (*Chaenactis* spp.), lupines (*Lupinus* spp.), clover (*Medicago* spp.), phacelia (*Phacelia* spp.), and sages (*Salvia* spp.) occur. Like other bumble bees, Crotch bumble bees are social insects that live in colonies consisting of a queen, workers, and reproductives (males and new queens). Hives are built underground. Little is known about the life cycles of Crotch bumble bees specifically, but it assumed they follow the general pattern of other bumble bees, wherein new queen emerge from hibernation in early spring to forage and select a nest site.

There are two CNDDB records for Crotch bumble bee within 5 miles of the Study Area (Figure 8). The nearest record is located approximately 0.35 miles southwest of the Study Area, on the western edges of the community of Neenach, and was recorded in 1976. The other record is located west of Quail Lake and was recorded in 1976 (CDFW 2017a).

No bumble bee species were observed during the field surveys. However, the Study Area does support potentially suitable habitat for this species. Suitable food plants including phaecelias (*Phaecelia* sp.) and lupines (*Lupinus* sp.) are present at low to moderate densities. Other wildflowers occur at higher densities, including fiddlenecks, but it is unknown if Crotch bumble bee will feed on these species.

4.7.2 Tricolored Blackbird

The tricolored blackbird is a CDFW Species of Special Concern and was advanced to candidacy for listing under CESA on December 10, 2015. As a candidate species, tricolored blackbirds receive the same legal protections afforded to listed species until the end of the review period (UC Davis 2017). Tricolored blackbirds are primarily year-round residents in California, with short-range migrations away from coastal areas during the non-breeding season (CDFW 2017b). Historically, the species was abundant in both coastal California and the Central Valley. Tricolored blackbirds have been nearly extirpated from coastal breeding locations and occur only in small numbers in southern California. Breeding populations in the Central Valley are fragmented (University of California Davis [UC Davis] 2017).

Tricolored blackbirds are highly gregarious birds that typically breed in emergent wetlands or in vegetation above or near bodies of freshwater (CDFW 2017b). Preferred nesting and roosting locations are in dense stands of cattails (*Typha* spp.) and bulrushes (*Scirpus* spp. or *Schoenoplectus* spp.), willow (*Salix* spp.) thickets, and blackberry (*Rubus* spp.) or wild rose (*Rosa* spp.) brambles. Dense herbaceous cover, including non-native mustards (*Brassica* spp.) or cheeseweed (*Malva* spp.) also may be used for nesting. Nesting occurs from mid-March, when males arrive at nesting sites, to late July or early August. Generally, two clutches are raised each season. Tricolored blackbirds are primarily granivores, although a variety of items may be taken. Foraging occurs in shrubland, pasturelands, croplands, wetlands, and grasslands; grain associated with dairies can be an important food source in the San Joaquin Valley (UC Davis 2017). Foraging grounds may be located up to 4 miles from the nesting site (CDFW 2017b).

Four CNDDB records for tricolored blackbirds occur within 5 miles of the Study Area (Figure 8). Two nesting colonies occur within a 4-mile radius of the Study Area, including one colony recorded approximately 2.5 miles west of the Study Area in 2008, and one colony recorded within the community of Neenach, approximately 2.8 miles east of the Study Area in 2014. Other records for breeding colonies occur in the vicinity of Quail Lake, approximately 5.5 miles southwest of the Study Area (CDFW 2017a).

Although tricolored blackbirds were not observed within the Study Area, a large flock of tricolored blackbirds and yellow-headed blackbirds was observed in the agricultural fields and trees on the south side of the California Aqueduct, adjacent to the Study Area. The flock was observed foraging in the irrigated agricultural fields and roosting in numerous trees adjacent to the aqueduct. Nesting may occur in the shrubs and vegetation along the canal, although it could not

be confirmed due to access restrictions. Figure 6 displays the special-status species observations. Appendix D contains a CNDDB data form for this observation.

The Study Area does not contain potentially suitable nesting habitat for tricolored blackbirds as aquatic habitats are very limited and associated riparian and emergent vegetation is sparse where it does occur. The Study Area may contain potentially suitable foraging habitat for tricolored blackbirds in the grasslands and fiddleneck fields; other suitable foraging habitat may occur on adjacent properties.

4.7.3 Western Burrowing Owl

The western burrowing owl (*Athene cunicularia hypugaea*) is a CDFW Species of Special Concern and a USFWS Bird of Conservation Concern for the Sonoran and Mojave Deserts Bird Conservation Region (BCR; CDFW 2017d, USFWS 2008). Burrowing owls occur year-round in the San Joaquin Valley and southwestern regions of California, and may winter along the coast and in the Coast Ranges (CDFW 2017b). Although this species still inhabits large portions of its historic range, it is negatively impacted by habitat loss due to agricultural and urban development, habitat degradation, and reduction in burrowing mammal populations (Klute *et. al* 2003).

Burrowing owls occur in open, dry grassland and desert habitats, and areas with low vegetation in agricultural fields. Burrowing owls prefer to utilize burrows dug by other species, especially ground squirrels, for nesting, but they may dig their own burrows in soft, friable soils. Pipes and culverts, piles of rock, concrete debris, nest boxes, or other materials may be used for nesting and habitation where burrows are scarce (CDFW 2017b). Burrowing owls may be active at any time of day or night, and typically forage for a variety of invertebrates, including crickets and grasshoppers, beetles, scorpions, centipedes, and earwigs; small rodents such a voles (*Microtus* sp.) and mice, small birds, and lizards also may be taken (Peeters 2007). Breeding occurs from March through August, with a peak in April and May. Clutches average five to six eggs and young fledge about 4 weeks after hatching (CDFW 2017b).

There are four CNDDB records for western burrowing owls with 5 miles of the Study Area, the nearest of which occurs approximately 1 mile east of the Study Area and was recorded in 1999 (Figure 8). The other three records were located between approximately 1.45 miles (one recorded from 2007) and 2.9 miles east of the Study Area (two additional records from 1999) (CDFW 2017a).

No burrowing owls were observed within the Study Area. One ground squirrel burrow of suitable size for burrowing owl residence, and with limited white wash at the entrance of the burrow was located within the Study Area (Figure 6). The whitewash was thought to be of insufficient size to belong to a burrowing owl, but could not be definitively identified. The Study Area does support potentially suitable habitat for this species due to the large, open grassland areas and native scrub habitats, with plentiful prey species. California ground squirrels and their burrows were observed within and immediately adjacent to the Study Area, and may provide suitable burrows.

4.7.4 Tehachapi Pocket Mouse

The Tehachapi pocket mouse (*Perognathus alticolus inexpectatus*) is a CDFW Species of Special Concern (CDFW 2017d). The Tehachapi pocket mouse is one of two subspecies of the white-eared pocket mouse (*Perognathus alticolus*), a rare resident of the San Bernardino and Tehachapi Mountains (CDFW 2017b). The Tehachapi pocket mouse is known from a few scattered populations from Tehachapi Pass, Mt. Pinos, and around Elizabeth, Hughes, and Quail Lakes. Elevations range from 3,500 to 6,000 feet (1,067 to 1,829 meters).

Tehachapi pocket mice inhabit native and non-native grasslands, Joshua tree woodland, pinyon-juniper woodland, and oak savannah habitats. This species is primarily nocturnal and may be seasonally active, hibernating in the winter and aestivating through the hottest summer months (CDFW 2017b, Eder 2005). At lower elevations, they may inhabit chaparral and coastal sage habitats. They forage on the open ground and beneath shrubs for seeds, likely preferring

various grass seeds. Burrows, which are used for shelter and breeding, are constructed in loose soils (CDFW 2017b). Breeding peaks in the late spring (Eder 2005).

There are five CNDDB records for Tehachapi pocket mouse within 5 miles of the Study Area. The nearest of these occurs approximately 0.65 miles south-southwest of the Study Area and was recorded in 1965 (Figure 8). Other records were located in the foothills east and north of the Study Area and were recorded in 2001 (one record) and 2010 (three records) (CDFW 2017a).

No Tehachapi pocket mice were observed during the field surveys. Potentially suitable habitat types are present within the Study Area and small mammal burrowing activity was common. However, the Study Area occurs just below the documented elevation range for this species. Given the location of the nearest CNDDB record and presence of potentially suitable habitat, it is possible that Tehachapi pocket mice may occur; the likelihood of occurrence is reduced due to the elevation of the Study Area and the age of the relevant occurrence record, and habitats within the Study Area are considered to be of marginal quality for this species.

4.7.5 American Badger

The American badger is a CDFW Species of Special Concern (CDFW 2017d). Badgers are uncommon, permanent residents throughout California, and occur most commonly in open stages of shrub, woodland, and herbaceous habitats. They are tenacious diggers, and occur where friable soils support denning and burrowing activities. They are active year round, and most often nocturnal, although they may be active during the day. They prey upon fossorial rodents, especially California ground squirrels and pocket gophers; rats and mice, some reptiles, insects, eggs, birds, and carrion also may be taken. Breeding typically occurs in the summer and early fall, with pups being born the following March or April in burrows dug in relatively dry, often sandy soil. American badgers are threatened primarily by indiscriminate trapping, agricultural conversion, and the eradication of ground squirrels and other fossorial rodents that comprise the majority of their prey base (CDFW 2017b).

There are three CNDDB records for American badgers within 5 miles of the Study Area (CDFW 2017a). The nearest of these is an undated record located approximately 2.7 miles northeast of the Study Area. Other records include one record located approximately 3.6 miles north of the Study Area from 2011 and one record located approximately 4.9 miles southwest of the Study Area in the vicinity of Quail Lake from 2001.

No American badgers or signs of American badger, including burrows or evidence of predation attempts, were observed during the field surveys. The Study Area does support potentially suitable American badger habitat, including fiddleneck fields, non-native annual grasslands, and shrub habitats. Suitable prey species including kangaroo rats, rabbits, and California ground squirrels, as well as nesting birds, were observed at sufficient densities to support American badgers.

4.7.6 Desert Kit Fox

The desert kit fox (*Vulpes macrotis*) is not federally- or state-listed, but is considered a species of local concern by the County of Los Angeles. It is an uncommon to rare permanent resident in arid habitats within southern California (CDFW 2017b). Kit foxes are threatened by a number of human activities, including poaching, pesticide and rodenticide use, and direct poisoning, as well as heavy agricultural and urban development (Eder 2005).

Desert kit foxes occur in desert and other arid habitats, including sagebrush flats, creosote scrub, and annual grassland habitats, and other areas with scattered brush, scrub, and shrubs. They are an important predator of small mammals, preying on black-tailed jackrabbits (*Lepus californicus*), desert cottontails (*Sylvilagus audubonii*), kangaroo rats, ground squirrels, and other rodents, insects, reptiles, birds and bird eggs. Limited vegetation may be taken. Desert kit foxes excavate burrows in loose-textured sandy or loamy soils for shelter, pupping, and as escape from extreme heat and cold

(Eder 2005, CDFW 2017b). Open, level areas are preferred for burrowing. Man-made structures and infrastructure, including culverts and pipes, also may be used for denning where suitable friable soils are not present (CDFW 2017b).

Desert kit fox are not tracked in the CNDDB, and no desert kit fox or sign of desert kit fox were observed during field surveys. However, the Study Area does occur within the range for this species and potentially suitable habitats are present. Suitable prey species, including kangaroo rats, desert cottontail, and black-tailed jackrabbits, were observed in sufficient densities to support desert kit fox.

4.7.7 Swainson's Hawk

The Swainson's hawk (*Buteo swainsoni*) is a state threatened species and a Bird of Conservation Concern (CDFW 2017d). Swainson's hawks are uncommon summer residents in the Central Valley and other parts of California, and year-round residents in a small portion of the Sacramento Delta. Historically, the species was abundant in California, but its numbers have declined due in part to destruction of suitable nesting habitat (CDFW 2017b).

Swainson's hawks occur in open habitats, including grassland, oak savannah, prairie, and open pine-oak woodland habitats, as well as in agricultural and cultivated areas with scattered tree stand (Ehrlich *et al.* 1988). Swainson's hawks have extremely variable home ranges based on distribution of nesting sites and high-quality foraging habitat, amount of foraging habitat, and seasonal prey availability. Ranges may be as small as several hundred acres up to almost 10,000 acres. The largest ranges occur within the Central Valley, where ranges vary from 10.65 to 15.59 square miles (mi^2; 6,816 to 9,978 acres), with much smaller ranges present in northern California (CDFW 2016). Nests are built in stands with few, large trees, or small groves, located near suitable foraging habitat including grasslands, grain or alfalfa fields, or livestock pastures. Breeding generally commences in late March and ends by late August, with a peak from late May through July (CDFW 2017b). One clutch of two or three eggs is laid (Ehrlich *et al.* 1988).

During the breeding season, Swainson's hawks forage for primarily mammalian prey, including ground squirrels, gophers, mice, voles, and rabbits; bats, snakes, lizards, and other birds also may be taken. Outside the breeding season, their diet shifts to include more insect prey, especially crickets, grasshoppers, dragonflies, butterflies, moths, and beetles (Cornell 2017).

There are no Swainson's hawk records within the Study Area 7.5-minute quadrangle or any adjacent 7.5-minute quadrangle, or within a 15-mile radius of the Study Area (CDFW 2017a). No Swainson's hawks or potential Swainson's hawk nests were observed within the Study Area during field surveys. The Study Area does occur within the range of Swainson's hawk, at the western edge of this species' extent within the Antelope Valley. Potential nesting habitat is extremely limited within the Study Area, although utility poles and snags and a few larger trees do occur; more suitable nesting habitat may be present in the Study Area vicinity. Potentially suitable foraging habitat that supports suitable prey species including burrowing mammals is present in the open shrubland and grassland habitats that are common throughout the Study Area. Although Swainson's hawks were not observed, this species does have potential to utilize the Study Area, particularly as foraging habitat.

4.7.8 Desert Tortoise

The desert tortoise is a federally threatened and state threatened species (CDFW 2017d). Desert tortoises are herbivorous terrestrial reptiles that inhabit arid desert environments in the southwestern United States and parts of Mexico. In the U.S., they occur in the Sonoran and Mojave deserts in southern California, southern Nevada, Arizona, and southwestern Utah. The desert tortoise is negatively impacted by habitat loss, fragmentation, and degradation, largely due to urbanization. Poorly managed grazing, highway and roadway construction, off-road vehicle use, increased wildlife frequency and intensity, and invasive species also negatively impact the tortoise. Historically, personal and commercial collection for the pet trade may have significantly impacted desert tortoise populations; the current impact of this activity is unknown (USFWS 2011).

Desert tortoises occur in a variety of habitats in suitable desert environments, including washes, sand and gravel flats, rocky hillsides, canyons, oases, and areas dominated by windblown sands (Stebbins and McGinnis 2012). They range in elevation from below sea level up to 7,300 feet (0 to 2,225 meters). At lower elevations, this species may occur on flats and slopes dominated by creosote bush (*Larrea tridentata*) and bursage (*Ambrosia dumosa*) scrub; at higher elevations, desert tortoises may occur on rocky slopes in blackbrush (*Coleogyne ramosissima*) scrub and juniper (*Juniperus californica*) woodland areas. Within the Mojave Desert, where the Study Area occurs, Germano *et al.* found tortoises most frequently occur on gently sloping terrain with sandy-gravel soils, where a suitably sparse cover of shrub occurs; most occupied habitat consists of creosote bush scrub below 5,500 feet (1,677 meters), where perennial plant diversity is high and there is a high production of annual plant species. This species forages on a wide variety of plant species, but is especially reliant on winter annuals. Perennial grasses, woody perennials, cacti, and some non-native species may be consumed (USFWS 2011). Regular access to drinking water is not essential, but tortoises will drink deeply when water is available (Stebbins and McGinnis 2012).

Desert tortoises are a burrowing species; typically they occur in areas with firm but not hard ground that is suitable for construction of the burrow this species relies on. Burrows typically are from 3 to 9 feet (1 to 2.8 meters) in depth, although depths up to 30 feet (9 meters) have been recorded. Burrows are used for shelter and play a pivotal role in thermoregulation. Activity patterns are seasonal, with daily activity patterns being highly temperature dependent (Stebbins and McGinnis 2012). Desert tortoises hibernate in their burrows through the coldest winter months, emerging in late winter or early spring to forage and breed, remaining active through the fall, although activity may decrease in the summer, dependent on temperatures. Even during periods of activity, much of their time is spent in their burrows (USFWS 2011). Mating may occur in the spring, summer, and fall; in California populations, peak egg-laying occurs in June and most clutches hatch in October (Stebbins and McGinnis 2012).

There are no CNDDB records within a 10-mile radius of the Study Area. The nearest documented desert tortoise occurrence was recorded in 2010 within the foothills approximately 10.47 miles northeast of the Project site. The next nearest occurrence is approximately 20.9 miles northeast of the Project site and was recorded in 2006. According to a letter from the CDFW written in response to issuance of the Project Draft Mitigation Negative Declaration, dated July 13, 2017, the Study Area does occur within the CDFW-accepted range for this species; however, maps reviewed by AECOM were not of sufficiently high resolution to confirm this. The Study Area does occur outside the USFWS-accepted current range for desert tortoise within the Mojave Desert, as mapped in the Environmental Conservation Online System (ECOS) species profile (USFWS 2017d). Additionally, a U.S. Geological Survey study conducted by Nussear *et al.* that modeled desert tortoise habitat in the Mojave and Sonoran Deserts (2009) indicated the Study Area is outside the western edge of occupied desert habitat and is adjacent to very low quality habitat for this species.

No desert tortoises, or their sign, including scat, tracks, burrows, egg shell fragments, pallets, courtship rings, etc., were observed during the field surveys. Habitat within the Study Area is for desert tortoise; preferred vegetation communities including creosote bush scrub are absent. Herbaceous grasslands may provide forage, however, and the Study Area does occur at suitable elevations. However, given the distance from any documented occurrences, the absence of observed sign during surveys, and the fact that the Study Area occurs outside the USFWS-accepted current range and outside the bounds of suitable habitat as modelled by Nussear *et al.*, this species is not expected to occur within the Study Area.

4.7.9 Special-status Plant Species

As discussed, no special-status plant species were observed during the field surveys. The CNDDB contains records for 18 special-status plant species within the Project 7.5-minute quadrangle and all adjacent 7.5-minute quadrangles. The majority of these are foothill and montane species and were determined to have no potential to occur within the Study Area, generally due to the Study Area either lacking suitable habitat types or occurring at unsuitable elevation. Three

species were identified as having low potential to occur, including round-leaved filaree (*California macrophylla*), Tracy's eriastrum (*Eriastrum tracyi*), and Piute Mountains navarretia (*Navarretia setiloba*) (see Appendix C). Potential for these species was determined to be low due to soil types within the Study Area and the distance from known occurrences; however, because floristic surveys were not conducted, their presence, although unlikely, cannot be definitely excluded.

5.0 Potential Impacts

The criteria for determining significant impacts on biological resources were developed in accordance with Section 15065(a) of the California Environmental Quality Act (CEQA) Guidelines, which states that a project may have a significant effect on the environment if the project has the potential to

(1) Substantially degrade the quality of the environment;

(2) Substantially reduce the habitat of a fish or wildlife species;

(3) Cause a fish or wildlife population to drop below a self-sustaining level;

(4) Threaten to eliminate a plant or animal community; and/or

(5) Reduce the number or restrict the range of an endangered, rare, or threatened species.

An evaluation of whether an impact on biological resources would be substantial must consider both the resource itself and how that resource fits into a regional or local context. A substantial impact is an impact that diminishes or results in the loss of a sensitive biological resource, or that significantly conflicts with local, State, or Federal resource conservation plans, goals, and/or regulations.

The following thresholds of significance are based on Appendix G of the CEQA Guidelines. Implementation of the proposed Project may have potentially significant adverse impacts on biological resources if it would result in any of the following:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or the USFWS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFW or the USFWS;
- Have a substantial adverse effect on State or federally protected wetlands as defined by USACE, CDFW, RWQCB, or California Coastal Commission (including but not limited to marsh, coastal, vernal pool, etc.) through direct removal, filling, hydrological interruption, or other means;
- 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;
- Conflict with any local policies or ordinances protecting biological resources such as a tree preservation policy or ordinance; and/or
- Conflict with the provisions of any adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan, or other approved local, regional, or State HCP.

The following sections discuss the potential effects of the proposed Project on the special-status species with potential to occur within the Study Area.

5.1 Sensitive Habitats

No sensitive habitats were identified within the Study Area or in the immediate vicinity of the Study Area. The nearest previously documented sensitive habitat, an area of valley needlegrass grassland that was recorded in 1992, is located approximately 2.69 miles north-northeast of the Study Area. Although needlegrass individuals were observed within the

Study Area, in no area did these individuals occur at densities high enough to qualify as needlegrass grassland (at least 10 percent relative cover in the herbaceous layer [Sawyer and Keeler-Wolf 2009]). Thus, no sensitive natural communities will be subject to impacts due to Project-related activities.

5.2 Waters Features

Several waters features, including one natural seasonal wetland feature, one man-made retention basin, and two natural drainage features, occur within the Study Area. Retention basins that were void of surface waters and displayed no signs of regular inundation were excluded from analysis as waters features. Jurisdictional boundaries were not assessed during the March and April 2017 surveys; however, a subsequent jurisdictional delineation was conducted in September 2017 and a separate jurisdictional delineation report is being prepared. For the purposes of assessing impacts, both drainages and both wetland features are assumed to be jurisdictional.

The proposed Project includes habitat management lands encompassing both potentially jurisdictional drainages and the potential jurisdictional seasonal wetland identified as Feature 2. Inundation containment berms will be constructed around drainages in order to avoid intrusion on jurisdictional boundaries and maintain adequate areas for flows. Feature 1 occurs outside the disturbance footprint of the proposed Project and is associated with existing infrastructure and will not be disturbed. Thus, no direct impacts to waters features due to removal of part or the entirety of these features are anticipated.

Potential indirect impacts to waters within the Study Area and downstream could include sedimentation if spoils piles or berms are positioned too close to waters features such that wind or rain transports sediments into the features. Best Management Practices (BMPs), including sediment and erosion control, will be employed as needed to prevent the deposition of sediments into waters features due to Project-related activities. Spoils piles and dirt berms will be positioned away from banks and features edges where wind or rain could transport sediment into the features.

If the proposed Project should require the disruption or removal of wetland or drainage features, necessary permits should be obtained prior to disturbance. The jurisdictional delineation report should be used to support and inform the permit applications and/or any mitigation that may be required.

5.3 Sensitive Plant and Wildlife Species

A total of eight special-status wildlife species, including one invertebrate, four birds, and three mammals, are known to occur or have potential to occur within the Study Area based on the habitat present, historical records, and the results of the field survey. Should these species occur, individuals and suitable habitat may be subject to direct or indirect impacts as a result of Project-related activities. The following sections discuss the potential for impacts to each species and its habitat, and an assessment of the significance of those impacts.

As Project plans were not finalized at the time of this report's preparation, assessments are based on generalized assumptions of Project activities. All impacts assume utilization of recharge basins with approximately 3-foot tall earthen berms, as described in Section 1.1.1. Equipment and laydown areas are assumed to be located within the Project disturbance footprint, in existing developed areas, or on existing roadways, so that temporary removal of habitats is negligible for all species.

5.3.1 Crotch Bumble Bee

As discussed, no bumble bee species were observed during the field survey. Historical records for Crotch bumble bee occur within 1 mile of the Study Area and the Study Area contains potentially suitable habitat for this species.

5.3.1.1 Direct Impacts

The likelihood that Crotch bumble bees occur within the Study Area is low as the species has not been observed in the vicinity within the last 40 years. Nonetheless, if Crotch bumble bee occurs, direct impacts may occur if colonies are present within the Study Area. Adult and larval bumble bees may be crushed or buried in hives during ground-disturbing activities, and individuals may be injured or killed due to collisions with vehicles and heavy equipment. Due to the low probability that this species occurs within the Study Area, no direct impacts are anticipated due to Project-related activities.

Implementation of the proposed Project would result in the temporary removal and adverse modification of approximately 1,200 acres the permanent removal of approximately 12 acres, and the short-term temporary removal of approximately 70.0 acres of potentially suitable foraging, breeding, and sheltering habitat for this species. Similar habitats are present in the habitat management lands and are common in the region, including on adjacent properties, and the Study Area represents a relatively small portion of the available potentially suitable habitat for this species. Due to the low likelihood that this species occurs, and the prevalence of suitable habitats in the vicinity, direct impacts to Crotch bumble bee habitat due to Project-related activities are expected to be less than significant.

5.3.1.2 Indirect Impacts

Indirect impacts to Crotch bumble bees in the vicinity may include temporary exposure to increased fugitive dust, noise, vibration, and human activity which may disrupt normal foraging and sheltering behaviors. Fugitive dust may hinder feeding by reducing nectar availability in areas adjacent to the Project if it occurs in sufficient amounts. All of these effects are short-term temporary; conditions would return to pre-Project levels upon completion of construction activities. Implementation of BMPs, including noise control measures would further minimize these impacts. Indirect impacts to Crotch bumble bee individuals in the vicinity as a result of Project-related activities will be less than significant.

Neighboring parcels may support suitable Crotch bumble bee habitat. Indirect impacts to these habitats and the species that occupy them may occur due to Project-related activities; these impacts could include an increase of fugitive dust as well as increasing noise and vibration during Project-related construction activities. These impacts are short-term temporary in nature and would return to pre-Project conditions following completion of construction. Implementation of BMPs including noise and dust reduction and control measures would minimize these indirect impacts. Project-related indirect impacts to Crotch bumble bee habitat will be less than significant.

5.3.2 California Horned Lark and Loggerhead Shrike

California horned larks and loggerhead shrikes were observed within the Study Area during field surveys. Nesting within the Study Area by these species is anticipated for horned larks and confirmed for loggerhead shrikes.

5.3.2.1 Direct Impacts

Direct impacts to California horned lark and loggerhead shrike individuals due to Project-related activities are not anticipated. Adult birds are highly mobile and capable of avoiding impacts with heavy equipment that may result in injury or mortality. Nests and nestlings of both species may be at risk of injury or mortality during vegetation clearing and ground disturbing activities. Fledgling horned larks which are unable to fly also may be susceptible to injury or mortality as a result of collisions with vehicles or heavy equipment. Because of this, if Project-related vegetation clearing or ground disturbance must occur during the breeding bird season (February 1 through September 15), pre-construction nesting bird surveys will be conducted to identify active nests and establish protective buffers. Biological monitoring during all vegetation clearing activities conducted during the breeding bird season will further minimize potential impacts to nesting, nestling, and fledgling California horned larks, loggerhead shrikes, and other bird species. Indirect impacts to California horned lark and loggerhead shrike individuals in the vicinity may include

temporary exposure to increased noise, vibration, and human activity which may disrupt normal foraging and sheltering behaviors. All of these effects are temporary; conditions would return to pre-Project levels upon completion of the proposed work activities. Implementation of BMPs including noise control measures would further minimize these impacts. Direct impacts to California horned lark and loggerhead shrike individuals as a result of Project-related activities will be less than significant.

Implementation of the proposed Project would result in the temporary removal or adverse modification of approximately 1,200 acres the permanent removal of approximately 12 acres and the short-term temporary removal of approximately 70.0 acres of grasslands, fields, and scrubland used as foraging and breeding habitat by these species. Similar habitats are present in habitat management lands and arecommon in the region, including on adjacent properties, and the Study Area represents a relatively small portion of the available suitable habitat for these species. Project-related direct impacts to California horned lark and loggerhead shrike breeding and foraging habitats are expected to be less than significant.

5.3.2.2 Indirect Impacts

Indirect impacts to California horned lark and loggerhead shrike individuals in the vicinity may include temporary exposure to increased noise, vibration, and human activity, which may disrupt normal breeding, foraging, and sheltering behaviors. All of these effects are short-term temporary; conditions will return to pre-Project levels upon completion of the proposed construction activities. Implementation of BMPs including noise control measures would further minimize these impacts. Indirect impacts to California horned lark and loggerhead shrike individuals in the vicinity as a result of Project-related activities will be less than significant.

As discussed, potentially suitable habitat also occurs in habitat management lands and on adjacent properties; these habitats and the species that inhabit them may be subject to indirect impacts including increased fugitive dust, noise, and vibration during Project-related activities, which may disrupt prey availability, and normal foraging, nesting, and sheltering behaviors. These impacts are temporary in nature and would return to pre-Project conditions following completion of construction work. Implementation of BMPs including noise and dust control measures would minimize these indirect impacts to habitat in the vicinity. Project-related indirect impacts to California horned lark and loggerhead shrike habitats will be less than significant.

5.3.3 Tricolored Blackbird

No tri-colored blackbirds were observed on the Project site during the field surveys, and no potentially suitable nesting habitat for this species occurs within the Study Area. However, tricolored blackbirds were observed in a mixed blackbird flock foraging on an agricultural property immediately south of the California Aqueduct adjacent to the Study Area and two nesting colonies are documented within 3 miles of the Study Area. Although nesting is not expected due to a lack of suitable habitat, tri-colored blackbirds may utilize the Project site as foraging habitat. Focused tricolored blackbird nesting surveys will be conducted in the 2018 breeding season to verify the status of these colonies and identify any other active colonies in the vicinity.

For the purposes of assessing impacts, it is assumed that these documented colonies remain active, and that no nesting occurs closer to the Study Area. Tricolored blackbirds may forage up to 4 miles from their nesting colony; this represents a maximum potential foraging range equal to 50.2 mi^2 (32,128 acres). In the vicinity of the documented nesting colonies, suitable foraging habitats primarily consist of active agricultural fields, grasslands, and shrubland on the valley floor and foothills. Currently, with the exception of the town of Neenach surrounding the eastern colony, the majority of the region supports open grasslands and mixed shrubland similar to habitats within the Study Area, particularly to the north where development is sparse.

5.3.3.1 Direct Impacts

Direct impacts to tricolored blackbirds are not anticipated. Adult tricolored blackbirds are highly mobile and would be capable of avoiding collisions with heavy equipment that may cause injury or mortality. No impacts to eggs, nests, or nestling tricolored blackbirds are anticipated as the Study Area does not contain suitable nesting habitat. Thus, impacts to individual tricolored blackbirds will be limited to indirect impacts. Thus, direct impacts to tricolored blackbird individuals will be less than significant.

The majority of the Study Area occurs within a 4-mile radius of at least one of the colonies; it is a minimum of 2.5 miles from the nearest colony. Project-related impacts will result in approximately 12 acres of permanent impacts, an insignificant portion of the total foraging range for this species. Temporary impacts to foraging habitat may include on average up to 400 acres of inundation at any one time; these impacts are rotational, irregular in timing, and are not expected to be continual, such that at many times the recharge basins will be dry. Natural drawdown of inundation is expected to support growth of annual herbaceous plant species, which may provide forage for tricolored blackbirds if the species utilizes the Project site. Given the extent of temporarily disturbed areas verses the extent of potential, similar quality foraging habitat located a similar distance or closer to the colonies, the duration of temporary impacts, and the large foraging range of this species, temporary loss of on average up to 400 acres of potential foraging habitat at any one time is not expected to be significant. Further, protection of approximately 322 acres of habitat management lands is expected to sufficiently off-set temporary foraging habitat lost to rotating inundation of the basins. Significant impacts due to the proposed Project to tricolored blackbird nesting habitat are not expected due to an absence of such habitat within the Study Area, and direct impacts to potential tricolored blackbird foraging habitat will be less than significant.

5.3.3.2 Indirect Impacts

Indirect impacts to tricolored blackbirds in the vicinity may include temporary exposure to increased noise, vibration, and human activity, which may disrupt normal foraging and sheltering behaviors. All of these effects are short-term temporary; conditions will return to pre-Project levels upon completion of the proposed construction activities. Implementation of BMPs including noise control measures would further minimize these impacts. Indirect impacts to tricolored blackbird individuals in the vicinity as a result of Project-related activities will be less than significant.

Indirect impacts to adjacent foraging habitats may include an accumulation of fugitive dust and increase noise during work activities. These impacts will be short-term temporary in nature and are expected to return to pre-Project conditions upon completion of the proposed construction activities. Indirect impacts will be minimized through the implementations of BMPs, including dust control measures. Through implementation of BMPs, indirect impacts to tricolored blackbird foraging habitat will be less than significant.

5.3.4 Western Burrowing Owl

Western burrowing owls were not observed during field surveys, but may occupy ground squirrel burrows and other suitable burrows within the fiddleneck fields, annual grassland, and scrub habitats within the Study Area. They also are known to inhabit pipes and culverts, and to use debris piles, broken concrete, discarded tires, and other man-made items as burrows (CDFW 2017b).

5.3.4.1 Direct Impacts

Direct impacts to western burrowing owl individuals due to Project-related activities are not anticipated. Adult burrowing owls are highly mobile and capable of avoiding impacts with heavy equipment that may result in injury or mortality. Nestling owls may be susceptible to injury or mortality as a result of collisions with heavy equipment or may be buried in collapsed burrows. Pre-construction surveys of the Project area to identify active burrows and establish protective buffers around occupied burrows will avoid direct impacts due to construction. Pre-operations

surveys will identify active burrows and avoid direct impacts due to inundation of the basins. Direct impacts to western burrowing owls will be less than significant.

Implementation of the proposed Project would result in temporary impacts to habitat encompassing on average up to 400 acres at any one time; these impacts are rotational, irregular in timing, and are not expected to be continual, such that at many times the recharge basins will be dry, the permanent removal of approximately 12 acres, and the short-term temporary removal of approximately 70.0 acres of potentially suitable foraging, sheltering, and breeding habitat for western burrowing owls. Similar habitats are common in the region and the Study Area represents a relatively small portion of the available suitable habitat for this species. Project-related direct impacts to western burrowing owl habitat are expected to be less than significant.

5.3.4.2 Indirect Impacts

Indirect impacts to western burrowing owl individuals in the vicinity may include temporary exposure to increased noise, vibration, and human activity which may disrupt normal foraging and sheltering behaviors. All of these effects are short-term temporary; conditions will return to pre-Project levels upon completion of the proposed work activities. Implementation of BMPs including noise control measures would further minimize these impacts. Impacts to western burrowing owl individuals in the vicinity as a result of Project-related activities will be less than significant.

Indirect impacts to western burrowing owl habitat in the vicinity of the Project and species that inhabit it may occur; these impacts could include an increase in fugitive dust as well as increased noise and vibration that may alter prey availability during Project-related construction activities. These impacts are short-term temporary in nature and would return to pre-Project conditions following completion of the proposed work. Periodic maintenance of the earthen berms may occur throughout the lifetime of the Project; these maintenance activities are not expected to require heavy equipment and indirect impacts would be limited to brief, irregular increased human activity within the recharge basins. Implementation of BMPs including noise and dust control measures would minimize these indirect impacts on western burrowing owl habitat. Project-related indirect impacts to western burrowing owl habitat will be less than significant.

5.3.5 Tehachapi Pocket Mouse

Tehachapi pocket mice were not observed during field surveys; however, no trapping surveys were conducted. Numerous small mammal burrows were observed throughout the Study Area. Potentially suitable habitat for this species may occur based on vegetation communities present; however, the Study Area occurs at a lower elevation than is documented for this species. Records for this species within 5 miles of the study area are few, with the closest one (at 0.65 mile) being over 50 years old. For these reasons, habitat within the Study Area is considered to be of marginal quality for Tehachapi pocket mice.

5.3.5.1 Direct Impacts

Tehachapi pocket mice are not expected to occur within the proposed Project area as suitability of habitat is marginal at best due to the elevation at the site, and there are no records from the vicinity to support their potential presence. No direct impacts to Tehachapi pocket mice would occur.

Implementation of the proposed Project would result in the temporary removal or adverse modification of approximately 1,200 acres the permanent removal of approximately 12 acres, and the short-term temporary removal of approximately 70.0 acres of marginally suitable foraging, sheltering, and breeding habitat. Similar, more suitable habitats are common in the Project region, including on adjacent properties, and the Study Area represents a relatively small portion of suitable habitat for this species. Further, habitats in the region are at slightly higher elevations and closer to the foothills, which are more suitable for this species. No direct impacts to Tehachapi pocket mouse suitable habitat would occur.

5.3.5.2 Indirect Impacts

Indirect impacts to Tehachapi pocket mouse individuals as a result of Project-related activities may include changes in normal sheltering and foraging habits as a result of exposure to increased noise, vibration, and human activity. Tehachapi pocket mice are not expected to occur due to the marginally suitable habitat. No indirect impacts to Tehachapi pocket mouse individuals are expected.

Adjacent properties support similar marginally suitable Tehachapi pocket mouse habitat. Adjacent habitats and species that inhabit them may be subject to indirect impacts during Project-related activities, including increased fugitive dust, noise, and vibration. Indirect impacts will be short-term temporary in nature, and will return to pre-Project conditions following completion of Project-related construction activities. Implementation of BMPs, including dust and noise control measures, will reduce these impacts. No indirect impacts to Tehachapi pocket mouse suitable habitat are expected.

5.3.6 American Badger and Desert Kit Fox

Neither American badgers nor desert kit fox, or their sign or dens, were observed during field surveys. Potentially suitable habitat for both species, including suitable prey species at sufficient densities, does occur within the Study Area. The Study Area also may provide transitory habitat for these species.

5.3.6.1 Direct Impacts

Direct impacts to American badger and desert kit fox individuals as a result of Project-related activities may occur but are expected to be minimal. Impacts may include injury or mortality due to collisions with vehicles or heavy equipment. Adult American badger and desert kit fox are highly mobile and are expected to avoid collisions with vehicles and heavy equipment. Implementation of BMPs during construction, including establishment of a Project site speed limit, pre-activity equipment surveys during construction for sheltering desert kit fox, and good housekeeping through proper disposal and regular removal of trash within the active work areas will minimize the risk of direct impacts to adults by increasing the amount of reaction time adults have prior to collisions and minimizing the appeal of the work areas to these species. Direct impacts to desert kit fox and American badger cubs in natal dens also may occur where natal dens are located within areas subject to ground disturbance. Pre-construction surveys of potentially suitable habitats will be conducted to identify active natal and non-natal dens, and to establish protective buffers, if warranted. Pre-operations surveys will identify active dens and avoid direct impacts to these species due to inundation of the basins. Direct impacts to American badger and desert kit fox will be less than significant.

Implementation of the proposed Project would result in temporary impacts encompassing on average up to 400 acres at any one time; these impacts are rotational, irregular in timing, and are not expected to be continual, such that at many times the recharge basins will be dry, the permanent removal of approximately 12 acres, and the short-term temporary removal of approximately 70.0 acres of suitable foraging, denning, sheltering, breeding, and transitory habitat for American badger and desert kit fox. Similar habitats are common in the region, including on adjacent properties, and the Study Area represents a relatively small portion of suitable habitat for these species. Project-related direct impacts to American badger and desert kit fox habitat are expected to be less than significant.

5.3.6.2 Indirect Impacts

Indirect impacts to desert kit fox and American badger individuals also may occur as a result of Project-related activities, and may include changes in normal transitory or foraging habits as a result of exposure to increased noise, vibration, and human activity. All indirect impacts to desert kit fox and American badger individuals will be short-term temporary in nature; conditions will return to pre-Project levels following completion of the proposed work. Implementation of BMPs and recommended mitigation measures, including pre-construction surveys for desert kit

foxes and American badgers, their dens, and their sign, noise and dust control measures, and pre-activity inspection of heavy equipment will result in indirect impacts that are less than significant.

As discussed, adjacent properties also contain potentially suitable American badger and desert kit fox habitats. These habitats and species occupying them may be subject to indirect impacts during Project-related activities due to increased fugitive dust, noise, and vibration, which may cause changes in the distribution of prey, altering the value of these habitats for desert kit fox and American badger. All indirect impacts will be short-term temporary in nature, and will return to pre-Project conditions following completion of Project-related construction activities. Implementation of BMPs, including dust and noise control measures, will reduce these impacts. Indirect impacts to American badger and desert kit fox habitats are expected to be less than significant.

5.3.7 Swainson's Hawk

No Swainson's hawks or their sign were not observed during the 2017 biological surveys, although potentially suitable grassland foraging habitat does occur within the Study Area. Suitable nesting habitat is limited and of very low quality within the Study Area, consisting of a limited number of utility poles and snags and a few larger trees.

Because Swainson's hawks have extremely variable home ranges, it can be difficult to accurately estimate home range size. The *Status Review of Swainson's Hawk in California* (CDFW 2016) documents home ranges for Central Valley Swainson's hawks as ranging from 10.65 to 15.59 square miles (mi^2; 6,816 to 9,978 acres). For the purposes of assessing impacts due to Project-related activities within the Study Area, it is assumed that the Project site may occur within foraging habitat for up to two breeding pairs of Swainson's hawks. This is based on an estimated breeding season home range of approximately 1,600 acres (2.5 mi^2); because data was not available for the Antelope Valley population, a conservative estimate equal to approximately 25 percent of the low end home range of the nearest population (Central Valley) was used.

5.3.7.1 Direct Impacts

Direct impacts to Swainson's hawk individuals due to Project-related activities are not anticipated. Adult Swainson's hawks are highly mobile and capable of avoiding impacts with heavy equipment that may result in injury or mortality. Nesting by Swainson's hawks is not anticipated within the Study Area due to a lack of high quality nesting habitat; therefore, nestling Swainson's hawks or active nests are not expected to be removed or otherwise disturbed by Project-related activities. Therefore, direct impacts to Swainson's hawks will be less than significant.

Implementation of the proposed Project would result in the permanent removal of approximately 12 acres, temporary impacts encompassing on average up to 400 acres at any one time; these impacts are rotational, irregular in timing, and are not expected to be continual, such that at many times the recharge basins will be dry, and the short-term, temporary removal of approximately 70.0 acres of potentially suitable foraging habitat for Swainson's hawks. As the average breeding season home range includes an estimated 1,600 acres, areas impacted by the proposed Project are not expected to significantly reduce foraging habitat for this species. The proposed Project includes only 12 acres of permanent impacts, which represents an insignificant portion of the total foraging range of a breeding pair; further, permanently impacted areas are not likely to be entirely composed of suitable foraging habitats, but likely will include some previously disturbed areas. Inundation of the basins may remove up to an average of 400 acres at any one time, but this removal will be temporary in nature, irregular in timing, and is not likely to be continuous. Construction of the berms may support growth of small mammal populations by providing suitable burrowing habitat; these species are important breeding season prey for Swainson's hawks. Because nesting is not expected on-site and no nests were observed in the immediate vicinity during biological surveys in 2017, the Project site is unlikely to comprise the majority of any one pair's foraging habitat. Nonetheless, permanent protection of approximately 322 acres of on-site foraging habitats as habitat management lands is expected to off-set temporary loss of foraging habitat due to inundation.

Additionally, similar habitats are common in the region and the Study Area represents a relatively small portion of the available suitable habitat for this species. Therefore, Project-related direct impacts to Swainson's hawk habitat are expected to be less than significant.

5.3.7.2 Indirect Impacts

Indirect impacts to Swainson's hawk individuals in the vicinity may include temporary exposure to increased noise, vibration, and human activity which may disrupt normal foraging behaviors. All of these effects are short-term temporary in nature; conditions will return to pre-Project levels upon completion of the proposed work activities. Implementation of BMPs including noise control measures would further minimize these impacts. Impacts to Swainson's hawk individuals in the vicinity as a result of Project-related activities will be less than significant.

Indirect impacts to Swainson's hawk habitat in the vicinity of the Project and species that inhabit it may occur; these impacts could include an increase in fugitive dust as well as increased noise and vibration that may alter prey availability during Project-related construction activities. These impacts are short-term temporary in nature and would return to pre-Project conditions following completion of the proposed work. With implementation of BMPs including noise and dust control measures to minimize these indirect impacts on Swainson's hawk habitat, Project-related indirect impacts to Swainson's hawk habitat will be less than significant.

5.3.8 Desert Tortoise

As described, due to the poor quality habitat present and location of the Study Area outside the USFWS-accepted current range for this species, no desert tortoise individuals are expected to occur within the Study Area. Therefore, no impacts, including both direct and indirect impacts, to desert tortoise are expected due to Project-related activities. Because the Study Area occurs outside the USFWS-accepted current range for desert tortoise, and because credible habitat models indicate that desert tortoise habitat is not present within the Study Area, direct and indirect impacts to desert tortoise are not anticipated to occur due to Project-related activities.

5.3.9 Special-Status Plant Species

As discussed, special-status plant species are not anticipated to occur within the Study Area based on a lack of observations during field surveys and absence of suitable habitats for special-status species recorded within a 9-quandrangle review of CNDDB occurrences. However, floristic surveys of the Study Area were not conducted; thus, the presence of special-status plant species cannot be definitively excluded. If special-status plant species individuals or populations do occur within the Study Area, Project-related activities may result in impacts to individuals and suitable habitat.

5.3.9.1 Direct Impacts

If special-status plant species individuals or populations do occur, Project construction and inundation of the recharge basins could result in removal or mortality of individuals within the disturbance footprint. Direct impacts would be permanent in nature, but, due to the low potential for any special-status plant species to occur, are not expected to impact a large number of individuals. Floristic surveys prior to construction of the basins will document the locations of any special-status plant populations or individuals, and direct impacts will be avoided wherever feasible through implementation of buffers. Where individuals or populations cannot be avoided, impacts will be minimized to the extent possible. Possible minimization measures are dependent on the species in question, but may include salvage of individuals for transplanting in suitable habitat within the habitat management lands and/or seed collection from established populations. Top soil salvage may be employed to preserve the existing seed bank. Mitigation of individuals lost or removed may be necessary if avoidance and minimization efforts are insufficient; however, this is not anticipated due to the low likelihood for impacts.

Direct impacts to special-status plant species habitat due to the proposed Project may include temporary and permanent removal of habitat due to construction of Project infrastructure and the basins. Habitat loss will be mitigated through protection of approximately 322 acres of habitat management lands, which will provide habitat suitable for upland grassland and shrubland species. However, impacts to special-status plant species habitat are expected to be minimal due to the low potential that the Study Area supports special-status plant species.

5.3.9.2 Indirect Impacts

If special-status plant species individuals or populations do occur, indirect impacts to individuals may include increased exposure due to adjacent vegetation clearing and increased fugitive dust. These impacts would be temporary in nature; conditions would return to pre-construction levels following completion of the proposed construction. De-vegetated areas are expected to be passively recolonized by adjacent plant species, reducing exposure and other edge habitat effects. Indirect impacts also may include changes in soil saturation levels due to inundation of the basins; although these impacts are most pronounced within the basins during inundation, individuals immediately adjacent also may be subject to temporary increases in soil saturation. Again, this impact would be temporary, dependent on the duration and rotation of basin inundation. Indirect impacts to individuals are expected to be minimal, however, due to the low potential for individuals to occur.

Indirect impacts to special-status plant species habitat may include increased erosion and accumulation of fugitive dust in adjacent habitats. Incursion and proliferation of non-native invasive species may occur in areas of disturbance. The majority of these indirect impacts are expected to be temporary in nature and will subside following completion of construction. Passive recolonization of the disturbed areas and berms will reduce indirect impacts in adjacent habitats over time. Overall, indirect impacts to special-status plant species habitat are expected to be minimal due to the fact that special-status plant species are not expected to inhabit the Study Area.

5.4 Habitat Connectivity and Wildlife Movement

Impacts to wildlife movement corridors and habitat fragmented through development can be detrimental to populations of species that rely on these areas for seasonal migration (usually one direction per season), interpopulation movement (long-term genetic exchange), and daily movements within an animal's territory (small travel pathways). Small travel pathways facilitate movement for daily home range activities such as foraging and escape from predators; however, they also provide connection between outlying populations and larger movement corridors, permitting an increase in gene flow between populations. Larger linkages between habitat types can extend for miles between primary habitat areas and occur on a regional scale throughout California (Spencer *et. al* 2010). Habitat linkages facilitate movement between populations located in discrete areas and populations located within larger habitat areas. Even where patches of pristine habitat are fragmented, the movement between wildlife populations is facilitated through habitat linkages, i.e., migration corridors and movement corridors.

The Study Area does not occur within any County-designated Significant Ecological Areas (SEAs) or CDFW-designated Essential Connectivity Areas (ECAs). Therefore, no impacts to areas deemed essential for regional habitat connectivity and wildlife migration will occur due to Project-related activities.

The Study Area, which consists of wide, relatively flat, unobstructed lands, may provide transitory and dispersal habitat for wildlife species moving between adjacent habitats. Habitat in the vicinity of the Study Area on the north side of the California Aqueduct is largely continuous and consists of habitats similar to those found within the Study Area. In the vicinity of the Study Area, only the California Aqueduct acts as a significant barrier to wildlife migration, partially obstructing movement between habitats north and south of the canal. Movement is permitted by a number of canal crossings, including those at 280th Street W and 300th Street W, and one at the approximate mid-point along the southern boundary of the Study Area. The proposed Project will not impact these crossings.

Construction of raised, native earthen berms over approximately 1,200 acres of the Study Area will reduce overall transitory and dispersal habitat quality; however it will remain permeable to movements through the Study Area and larger region. Flooding of approximately 400 acres at any one time will regularly, if temporarily, obstruct dispersal and overland movements in those areas. Adjacent suitable properties are available for transitory movements and overland dispersal. The reduction of dispersal habitat quality and intermittent long-term temporary removal of overland dispersal habitat is not expected to significantly impact wildlife movement in the region. Project impacts to wildlife movement and habitat connectivity are expected to be less than significant.

6.0 Recommended Minimization and Mitigation Measures

The following discussion provides recommended avoidance and minimization measures based on potential impacts from construction-related activities on sensitive species. To minimize potential impacts during Project construction, it is recommended that AVEK implement the following mitigation measures.

BIO-1. **Burrowing Owls** – Prior to ground-disturbing activities and other habitat disturbance, clearance surveys for active burrowing owl burrows shall be conducted of all areas subject to disturbance. Prior to ground-disturbance associated with construction of the Project, including vegetation clearance and grubbing, preconstruction clearance surveys shall be conducted by a qualified biologist within the Project site and a 500-foot buffer of the site in order to locate active burrowing owl burrows. Pre-construction clearance surveys shall be conducted no more than two (2) weeks prior to construction. Surveys will be conducted following guidelines provided in the *Staff Report on Burrowing Owl Mitigation* (CDFW 2012).

Within two (2) weeks prior to inundation, trained AVEK personnel shall review all areas subject to inundation for presence of burrows with entrances suitable for burrowing owl occupation and potential burrowing owl sign. Any identified potentially occupied burrows will be investigated further by a qualified biologist prior to inundation. Training will be conducted by a qualified biologist for AVEK personnel who conduct pre-inundation surveys prior to the commencement of the first inundation survey. Training will discuss burrowing owl identification and sign and burrow recognition, their status, and the laws governing their protection. Training will be conducted by a qualified biologist on an annual basis for all Project operations personnel as a refresher.

If no burrowing owls are detected, no further mitigation will be required. If burrowing owls are observed during any survey, the following measures will be implemented:

a. Occupied burrows will not be disturbed during the nesting season (April 1 through October 15).

b. Occupied burrows will not be subject to inundation during operation of the water bank.

c. Avoidance shall be the preferred approach for occupied burrows whenever feasible. If occupied burrows are observed during the non-breeding season (October 16 through March 31), a 160-foot buffer will be established; no construction or other physical work activities will occur within the buffer. If occupied burrows are observed during the breeding season (April 1 through October 15), and a 650-foot buffer shall be established; no construction or other physical work activities will occur within the buffer.

d. When destruction of occupied burrows is unavoidable, destruction shall occur only during the non-nesting season (October 16 through March 31). Prior to destruction of occupied burrows within the Project site, any unsuitable burrows outside the disturbance footprint will be enhanced (enlarged, cleared of debris) to facilitate occupation.

e. If owls must be moved away from the Project area, passive relocation techniques (e.g., installation one-way exclusion doors at burrow entrances) will be used instead of trapping. Passive relocation techniques will be employed for a minimum of one week–in order to allow owls to acclimate to alternate burrows.

In order to provide protections for burrowing owls throughout construction and operations of the Project, a Burrowing Owl Protection Plan shall be developed prior to construction of the recharge basins. This plan will be developed in consultation with the CDFW and will provide acceptable strategies for avoiding and minimizing impacts to burrowing owls and burrowing owl habitat on the Project site.

BIO-2. **Desert Kit Fox and American Badger.** Clearance surveys for occupied desert kit fox and American badger dens shall be conducted prior to any Project disturbance activities, including initial construction and ongoing operations such as inundation of the recharge basins.

Within two (2) weeks prior to inundation of the basins, trained AVEK personnel shall review all areas subject to inundation for potential sign of American badger or desert kit fox, including active and inactive natal and non-natal dens. Any identified potential sign of presence will be investigated further by a qualified biologist prior to inundation. Training will be conducted by a qualified biologist for AVEK personnel who conduct pre-inundation surveys prior to the commencement of the first inundation survey. Training will discuss American badger and desert kit fox identification and sign and den recognition, their status, and the laws governing their protection. Training will be conducted by a qualified biologist on an annual basis for all Project operations personnel as a refresher.

If dens are observed, the following measures will be implemented:

a. Occupied dens will not be subject to inundation during operation of the water bank.
b. Inactive dens shall be excavated by hand with a shovel to prevent badgers/kit foxes from re-using dens during construction.
c. If active natal dens are observed during the survey, a 300-foot buffer shall be established around the den; no construction or work activities will occur within the buffer. The den shall be monitored and the buffer maintained until a qualified biologist has determined that the den is no longer active, at which time it shall be excavated by hand to prevent re-use. Passive relocation of American badger and desert kit fox shall not take place while young are still in dens and dependent on the parents for food, or while females may be pregnant.
d. If active, non-natal dens are observed within the Project site or buffer, badgers/kit foxes shall be discouraged from using these dens prior to clearing, grubbing, and/or grading of the site, by partially blocking the entrance of the den with sticks, debris, and soil for 3 to 5 days. Access to the den shall be incrementally blocked to a greater degree over this period, encouraging the badger/kit fox to vacate the den of its own volition. After badgers/kit foxes have stopped using active dens within the Project boundary, the dens shall be hand-excavated with a shovel to prevent re-use.
e. If newly active badger/kit fox dens are found during construction activities, all work in the area shall cease until the biologist can safely close the den.
f. If a desert kit fox or American badger is encountered during Project activities, all work that could result in a direct injury, disturbance, or harassment shall immediately stop and the Project biologist shall be notified.
g. Where desert kit foxes have the potential to occur, all heavy equipment and vehicles left on-site overnight will be inspected at the beginning of each work day to verify that no individuals have taken shelter under the equipment. If a desert kit fox is observed, the project biologist shall be

notified and the animal shall be observed from a distance until it has moved out of the area of its own accord.

BIO-3. **Nesting Birds Protection.** If construction activities occur during breeding bird season (February 1 through September 15), all vegetation clearing and initial ground disturbing activities will be preceded by a nesting bird survey. Nesting bird surveys will be conducted by a qualified biologist of all areas that may support nesting and will be subject to disturbance, as well as a 300-foot buffer for passerine species and 500-foot buffer for raptors. Surveys will be conducted no more than 7 days prior to construction activities.

a. If an active nest is observed, a no-disturbance buffer will be established until a qualified biologist has determined the nest has either failed or has successfully fledged and the young are no longer dependent on the nest. The no-disturbance buffer will measure no less than 500 feet for raptors, and 300 feet for all other species.

b. Vegetation clearing activities during avian breeding season within suitable nesting habitat shall be monitored by a qualified biologist.

BIO-4. **Wildlife Movement and Entrapment (Trenches).** All trenches that are to be left open overnight shall be either securely covered or have wildlife escape ramps installed during non-work hours to prevent entrapment of common and special-status wildlife species. All steep-walled pipeline and utility trenches shall be inspected in the mornings and prior to back-filling to prevent mortality of common and special-status wildlife species. All entrapped wildlife will be removed or allowed to escape voluntarily via escape ramps prior to construction resuming.

BIO-5. **Wildlife Movement and Entrapment (Pipelines).** All pipes, culverts, or similar structures on-site with a diameter of 2 to 24 inches shall be inspected for special-status species prior to moving or welding. Openings shall be capped or otherwise covered if sections cannot be inspected to prevent the entry and potential loss of wildlife. If a common or special-status species is discovered inside a pipe, the animal shall be safely removed. The pipe segment shall not be moved until the animal has escaped, or the pipe segment shall be moved a single time out of the path of construction. Alternatively, stored pipe may be kept capped at all times until used during construction. Vertical, open-ended pipes used as fence posts, property line demarcations, sign posts, etc., will be capped or otherwise plugged to prevent the entrapment and possible injury and mortality of wildlife.

BIO-6. **Sediment and Erosion Control.** The best available sediment and erosion control measures will be employed to prevent the downstream spread of sediments from the site. Measures will be installed prior to construction and maintained throughout Project construction. Such measures may include sediment basins, gravel bags, silt fences, geo-bags, or gravel and geotextile fabric berms, erosion control blankets, coir rolls, jute net, and straw bales. The use of erosion control materials potentially harmful to wildlife species, including monofilament netting (erosion control matting) or similar material, will not be employed.

a. No sediments or debris will be allowed to enter the drainage channel. Vehicle maintenance and refueling activities will occur only in designated areas located no less than 100 feet from the drainage channel.

b. Spoils piles will not be located near the drainage channel where rain events may convey such sediments into the channel.

BIO-7. **Special-Status Plants.** Prior to construction of the recharge basins, floristic surveys shall be conducted of all potentially suitable habitats on the Project site. Floristic surveys shall be conducted by a qualified biologist following CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant*

Populations and Natural Communities (CDFW 2009). If no special-status plants are observed, no further mitigation will be necessary. If special-status plants are observed during surveys, the following measures will be implemented:

a. Individuals will be protected in place to the extent feasible through implementation of avoidance and buffers.

b. If special-status plant individuals or populations must be impacted, individuals will be salvaged and/or transplanted to suitable habitat within the established on-site habitat management lands. If salvage is not feasible, mitigation at a 2:1 ratio will be provided within habitat management lands. In the case of annual species, top soil salvage may be employed to preserve the existing seed bankwhere appropriate enhancement of existing populations may be employed at the same 2:1 ratio.

BIO-8. **Swainson's Hawk.** Prior to construction of the recharge basins, focused Swainson's hawk surveys shall be conducted. Surveys for Swainson's hawk shall be conducted by a qualified biologist following the methods outlined in *Swainson's Hawk Survey Protocols, Impact Avoidance, and Minimization Measures for Renewable Energy Projects in the Antelope Valley of Los Angeles and Kern Counties, California* (CDFW 2010). Surveys shall include all potential Swainson's hawk nesting habitat within a 5 mile radius of the Project site. Surveys shall include all potential nest trees, towers or other potential nest sites (including nests used within the last 5 years) outside the nesting season for Swainson's hawk.

If no active Swainson's nests are observed, no further mitigation will be necessary. If an active Swainson's hawk nest is detected during focused surveys, the following measures will be implemented:

a. No removal of active Swainson's hawk nests will be conducted during Project construction and/or operations.

b. No construction activities will be conducted within a 0.5-mile radius of an active Swainson's hawk nest. Prior to construction activities, a qualified biologist will conduct a focused Swainson's hawk nest survey within an up to 0.75-mile radius of proposed construction activities to identify any active nests.

c. If active Swainson's hawks nests are identified within a 0.5-mile radius of the Project site, a *Habitat Management Plan* will include specific, detailed measures to avoid and minimize impacts to Swainson's hawks in or near the Project site during both construction and operation of the Project.

BIO-9. **Tri-colored Blackbird Protection.** Prior to construction of the recharge basins, focused nesting tri-colored blackbird surveys shall be conducted of all potentially suitable nesting habitats and documented nesting colonies within the Project site and within a 3-mile radius of the Project site for any active nesting colonies.

BIO-10. **Jurisdictional Drainages and Wetlands.** Prior to construction of the recharge basins or any ground-disturbing activities within waterways and wetlands on the site, a formal Jurisdictional Delineation will be conducted of all potential jurisdictional waters within the Project site. Fill or disturbance of any jurisdictional waters or wetlands will be permitted through the appropriate agency (i.e., Sections 401 and 404 of Clean Waters Act, or Section 1600 of California Fish and Game Code). Impacts to jurisdictional

waters and wetlands will be avoided to the extent feasible, and shall not occur prior to issuance of any required local, state, and federal permits.

BIO-11. **Habitat Mitigation.** AVEK has designated a significant allotment of land as habitat management lands. The purpose of these areas is to provide foraging habitat for Swainson's hawk, tricolored blackbird, nesting and foraging habitat for burrowing owl, and denning and foraging habitat for desert kit fox and American badger. The details of the management of these lands shall be described in a Habitat Management Lands Plan to be reviewed and approved by CDFW prior to construction of the recharge basins.

The following general measures also are recommended to be incorporated into the Project, in order to protect biological resources.

GEN-1. **Worker Environmental Awareness Training.** Prior to construction, a Worker Environmental Awareness Training shall be prepared and presented by a qualified biologist to all construction personnel at the start of Project-related activities. The training shall discuss sensitive-status species with the potential to occur within the Project footprint, including their regulatory status, description, and habitat requirements, and any sensitive habitat areas that may be encountered. The program shall emphasize the importance of minimizing disturbance, and describe the federal, state, and local regulations protecting biological resources and the potential penalties for non-compliance with these laws and statutes.

GEN-2. **Equipment Staging.** All construction equipment, staging areas, materials and personnel shall be restricted to existing roadways and road shoulders, designated work areas, or previously disturbed off-site areas that are not habitat for special-status species.

GEN-3. **Site Cleanliness.** All trash and food items shall be contained and removed from the site regularly to prevent attracting predators and scavengers, such as dogs, coyotes, desert kit fox, or common ravens, to the Project area.

GEN-4. **Hazardous Waste Clean-up.** Any spills of petroleum products or other chemicals, which may represent a hazard to wildlife, shall be cleaned up promptly and in accordance with appropriate laws and regulations.

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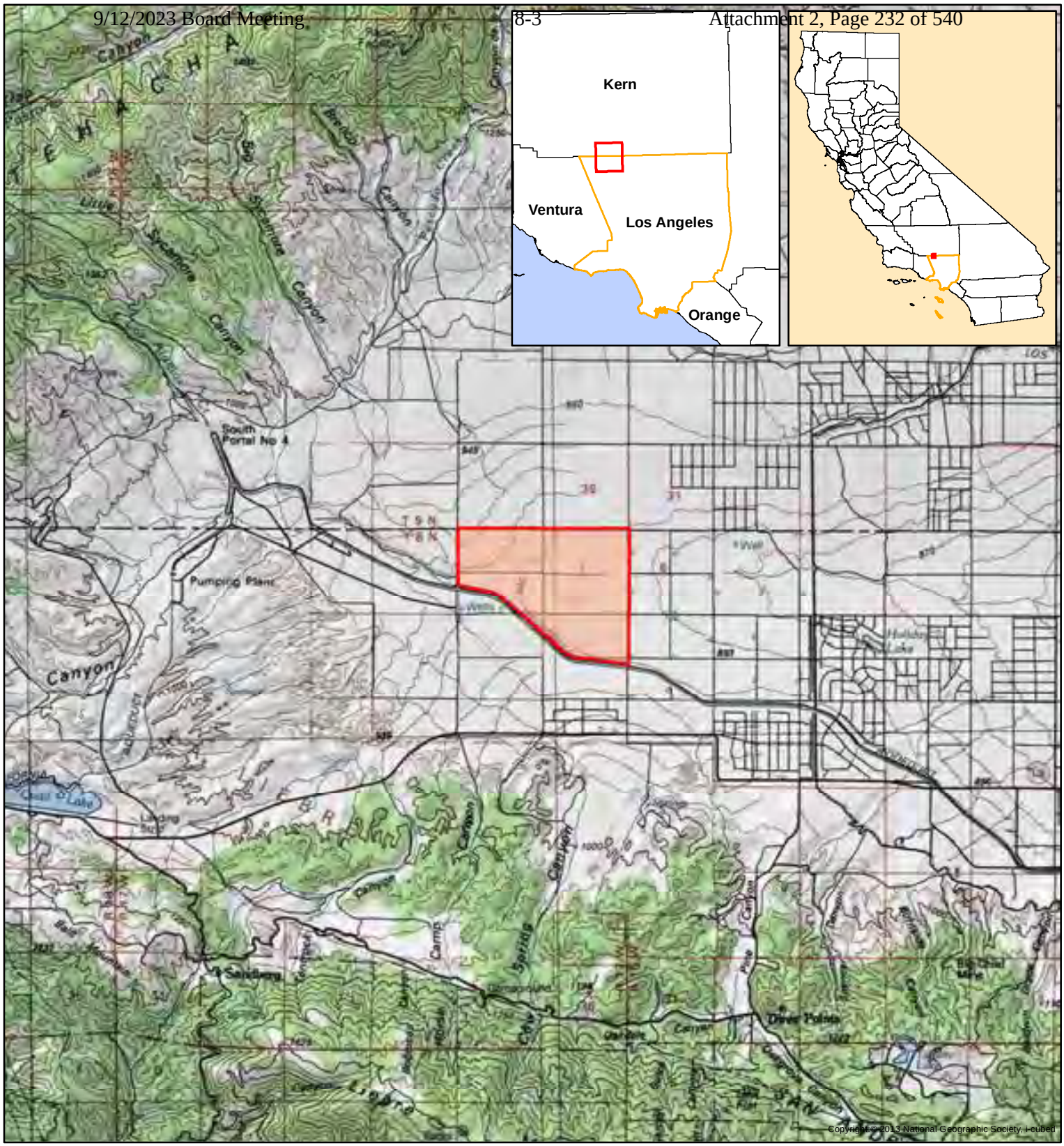
Figures



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Legend

Study Area

0 0.5 1 2 Miles

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Antelope Valley - East Kern Water Agency High Desert Water Bank Biological Technical Report			Site Vicinity Figure 1
DRWG: Sara Snyder	Date: 4/19/2017	Revision: 1	

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Legend
- Study Area
- 100-ft Buffer

0 0.125 0.25 0.5 Miles

N

AECOM

Antelope Valley - East Kern Water Agency
High Desert Water Bank
Biological Technical Report

DRWG: Sara Snyder | Date: 4/21/2017 | Revision: 1

Study Area
Figure 2

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Legend

- Study Area
- 100-ft Buffer

Soil

- HcA: Hanford sandy loam, 0 to 2 percent slopes
- OaC: Oakdale sandy loam, 2 to 9 percent slopes
- ObC: Oak Glen sandy loam, 2 to 9 percent slopes
- VaA: Vernalis sandy loam, 0 to 2 percent slopes
- VbA: Vernalis loam, 0 to 2 percent slopes
- VcA: Vernalis clay loam, 0 to 2 percent slopes

0 0.1 0.2 0.4 Miles

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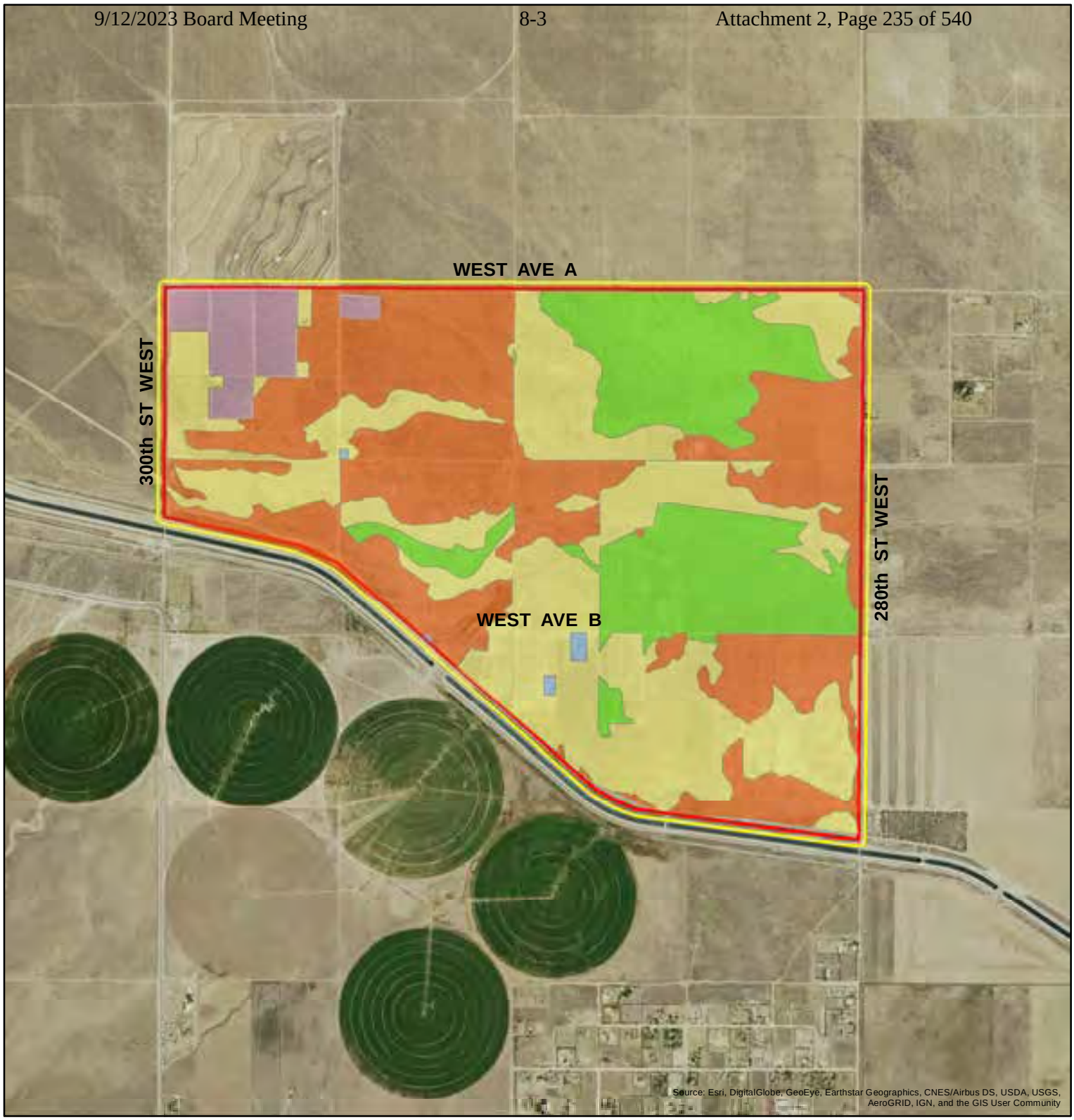
Soils
Figure 3



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Legend

- Study Area
- 100-ft Buffer

Vegetation

- Developed
- Fallow Agriculture
- Fiddleneck Fields
- Non-Native Annual Grasslands
- Rubber Rabbitbush Scrub

0 0.125 0.25 0.5 Miles

N

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Vegetation
Figure 4

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Legend
- Study Area
- 100-ft Buffer
- Waters Features
- Retention Basins

0 0.125 0.25 0.5 Miles

N

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Potential Waters Features
Figure 5

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Legend

- Study Area
- 100-ft Buffer
- American Kestrel
- Buteo sp.
- Cooper's hawk
- Loggerhead Shrike
- Loggerhead Shrike Nest
- Northern Harrier
- Raptor/Raven Nest
- Raven Nest
- Suitable Burrow
- Tricolored Blackbird

0 0.125 0.25 0.5 Miles

N

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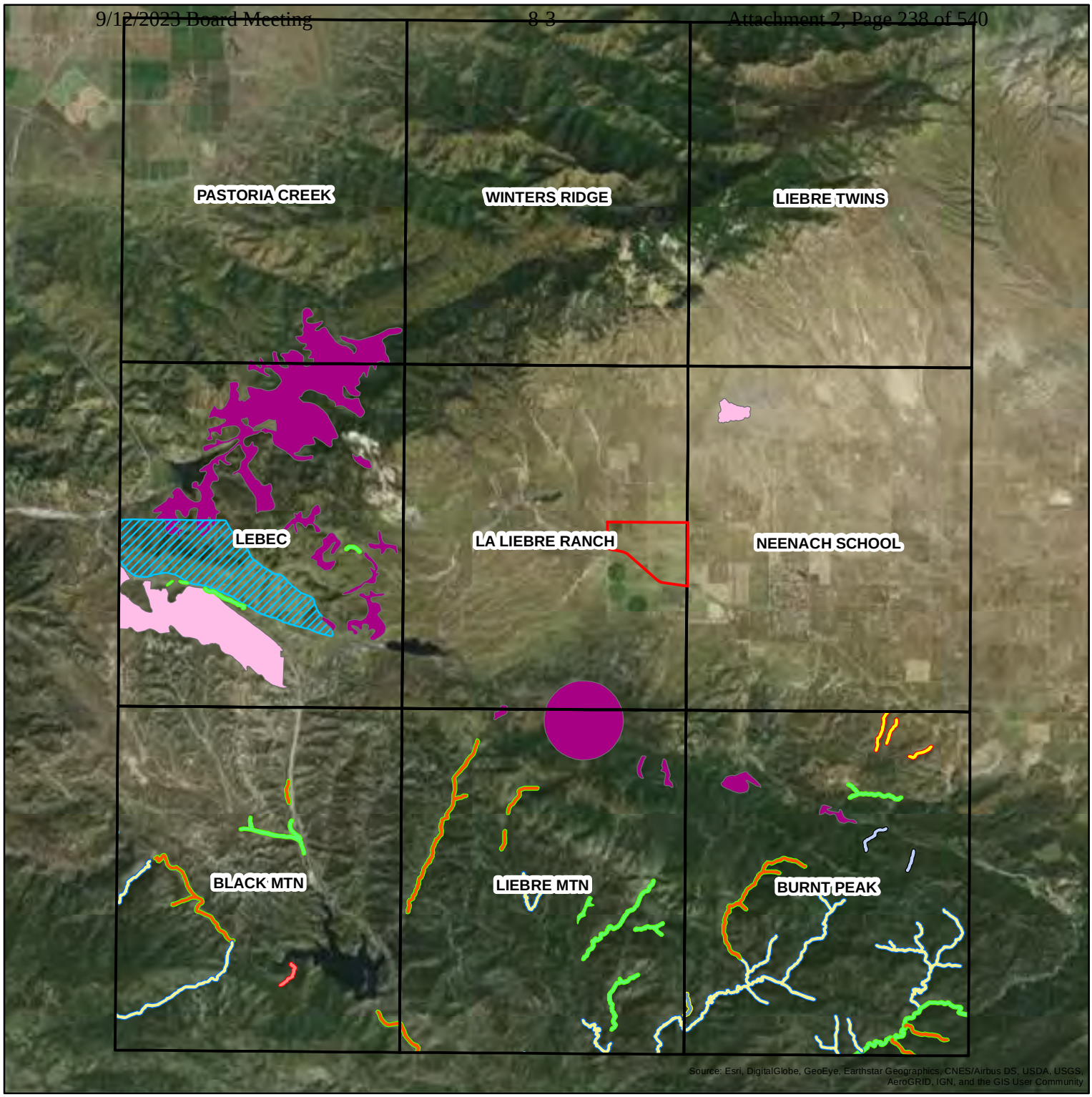
Special-Status Species Observations
Figure 6



Legend

- Study Area
- 9 Quad
- Canyon Live Oak Ravine Forest
- Southern Coast Live Oak Riparian Forest
- Southern Cottonwood Willow Riparian Forest
- Southern Mixed Riparian Forest
- Southern Riparian Forest
- Southern Riparian Scrub
- Southern Sycamore Alder Riparian Woodland
- Southern Willow Scrub
- Valley Needlegrass Grassland
- Valley Oak Woodland
- Wildflower Field

0 1.25 2.5 5 Miles

N

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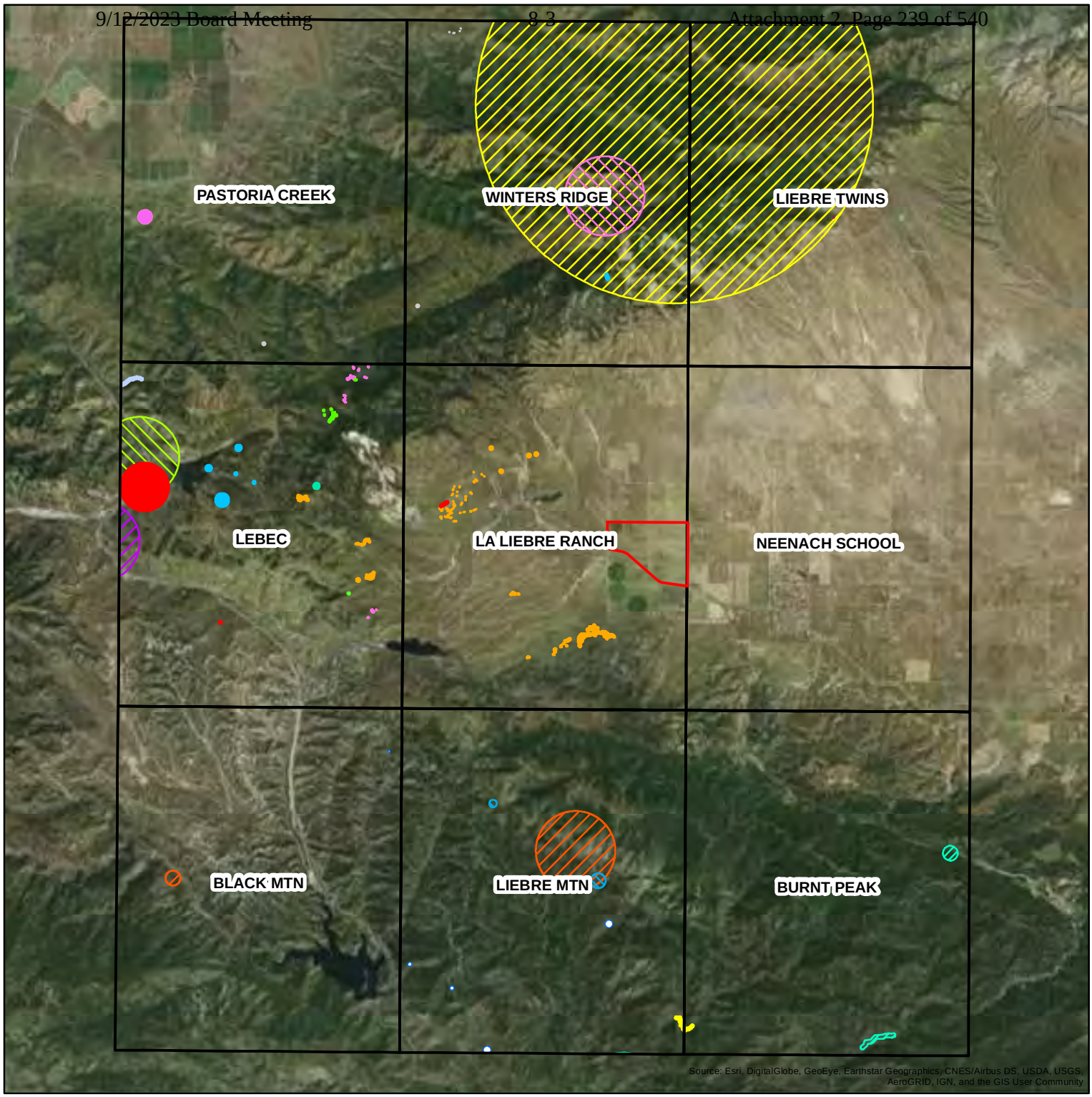
CNDDB Sensitive Habitats
9 Quads
Figure 7a



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Legend

- Study Area
- 9 Quad
- Baja navarretia
- Fort Tejon woolly sunflower
- Greata's aster
- Madera leptosiphon
- Mt. Gleason paintbrush
- Mt. Pinos onion
- Palmer's mariposa-lily
- Peirson's morning-glory
- Piute Mountains navarretia
- San Bernardino aster
- Tehachapi buckwheat
- Tehachapi monardella
- Tejon poppy
- Tracy's eriastrum
- Calico monkeyflower
- Delicate bluecup
- Round-leaved filaree
- Slender mariposa-lily
- Umbrella larkspur

0 1.25 2.5 5 Miles

N

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High Desert Water Bank
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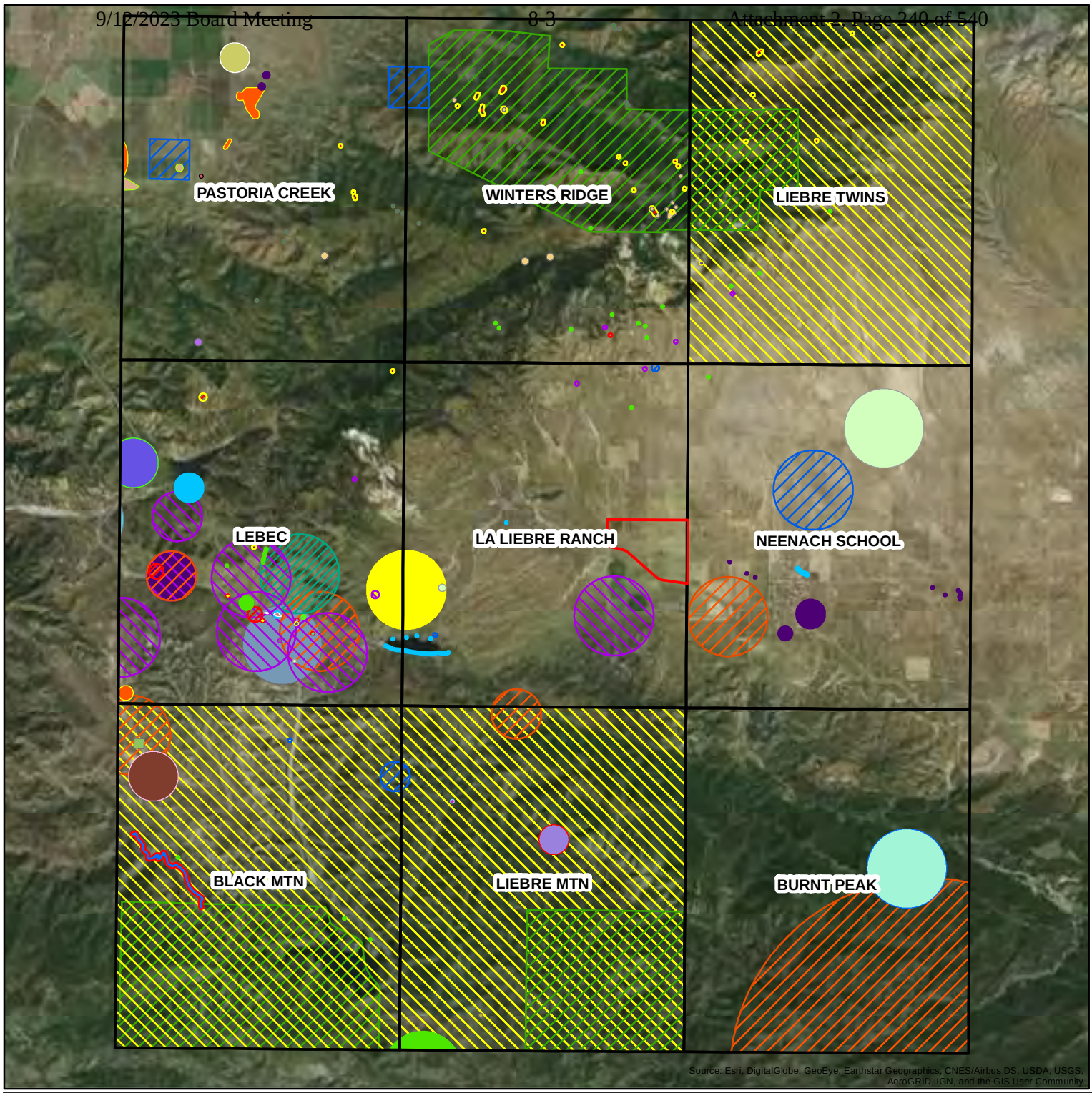
CNDDB Plant Species
9 Quads
Figure 7b



Legend

- Study Area
- 9 Quad
- American badger
- California condor
- California glossy snake
- California horned lark
- Crotch bumble bee
- Desert cuckoo wasp
- San Bernardino ringneck snake
- San Emigdio blue butterfly
- San Joaquin Pocket Mouse
- San Joaquin kit fox
- Tehachapi pocket mouse
- Tehachapi slender salamander
- Townsend's big-eared bat
- Yuma myotis
- Arroyo toad
- Bald eagle
- Blunt-nosed leopard lizard
- Burrowing owl
- Coast horned lizard
- Coastal California gnatcatcher
- Coastal whiptail
- Ferruginous hawk
- Fringed myotis
- Golden eagle
- Grasshopper sparrow
- Loggerhead shrike
- Long-legged myotis
- Pallid bat
- Prairie falcon
- Purple martin
- Silvery legless lizard
- Slender mariposa-lily
- Tricolored blackbird
- two-striped gartersnake
- Western pond turtle
- Western spadefoot
- Yellow warbler
- Yellow-blotched salamander

N

0 1.25 2.5 5 Miles

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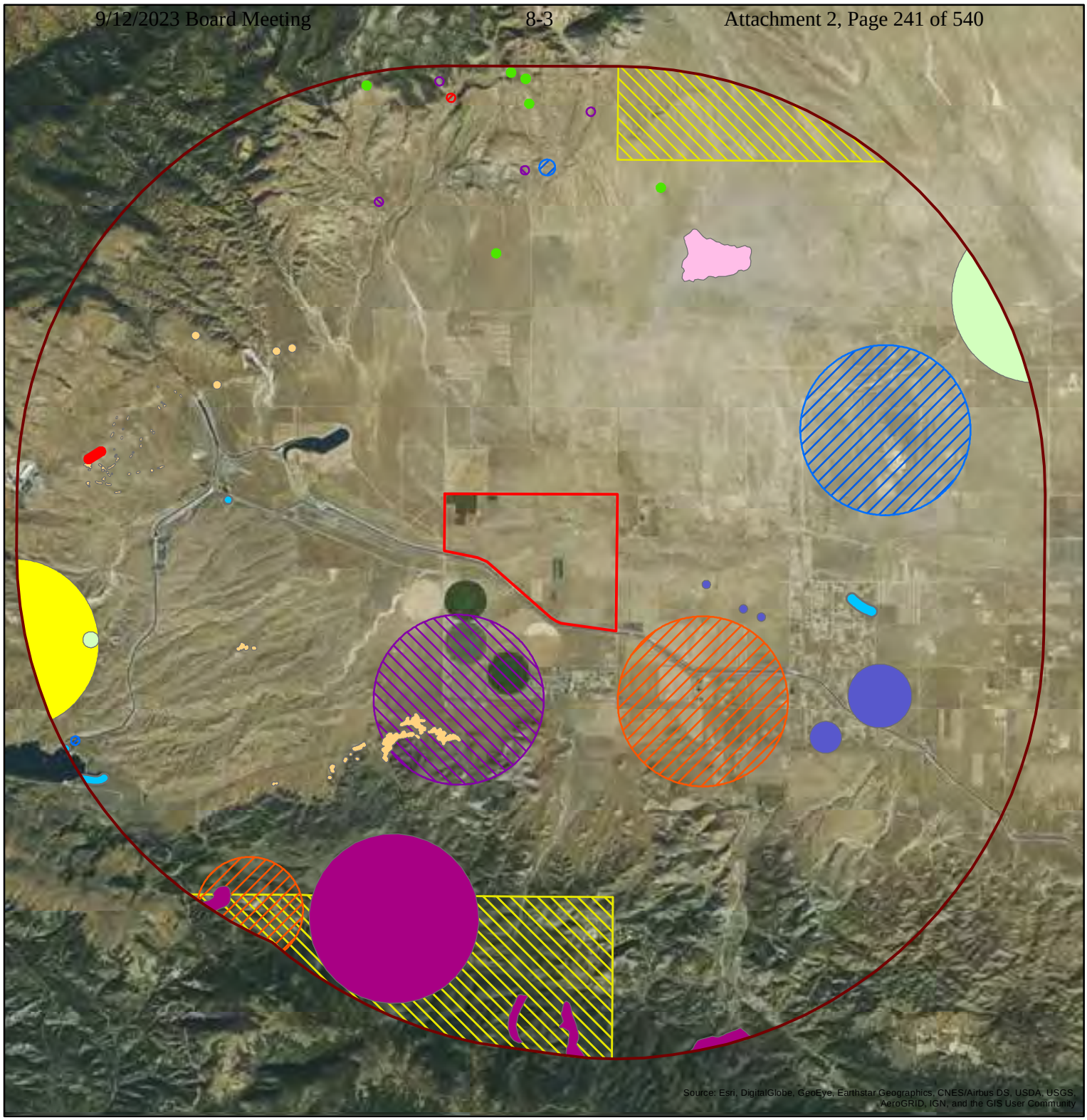
CNDDB Wildlife Species
9 Quads
Figure 7c



Legend

- Study Area
- 5-mile Buffer
- American badger
- Crotch bumble bee
- Palmer's mariposa-lily
- Tehachapi pocket mouse
- Valley Needlegrass Grassland
- Valley Oak Woodland
- Burrowing owl
- Coast horned lizard
- Ferruginous hawk
- Loggerhead shrike
- Prairie falcon
- Round-leaved filaree
- Tricolored blackbird
- Two-striped gartersnake

0 0.5 1 2 Miles

N

I:\BIO Resources\GIS\AVEK\FarWest_Fig8_CNDDB_5_mile.mxd

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High Desert Water Bank
Biological Technical Report

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CNDDB Records within 5 miles
Figure 8

Appendix A:
Plant and Wildlife Species Observed Within the Study Area

TABLE A-1: Plant Species Observed Within the Study Area

Scientific Name	Common Name	Native /Introduced[1]
Ambrosia acanthicarpa	Annual bursage	N
Amsinckia intermedia	Common fiddleneck	N
Amsinckia tessellata	Devil's lettuce	N
Artemisia dracunculus	Tarragon	N
Astragalus didymocarpus	Dwarf white milk vetch	N
Astragalus douglasii	Douglas's milkvetch	N
Atriplex canescens	Hoary saltbush	N
Atriplex polycarpa	Cattle spinach	N
Bromus diandrus	Ripgut brome	I[2]
Bromus madritensis	Red brome	I[2]
Bromus tectorum	Cheat grass	I[2]
Calandrinia menziesii	Red maids	N
Calocedrus sp.	Cedar	I
Camissonia strigulosa	Contorted primrose	N
Castilleja exserta	Owl's clover	N
Convolvulus arvensis	European bindweed	I
Croton setiger	Dove weed	N
Cryptantha nevadensis var. *rigida*	Rigid cryptantha	N
Cryptantha oxygona	Sharpnut cryptantha	N
Cucurbita palmata	Coyote melon	N
Descurainia sophia	Flex weed	I[2]
Ericameria nauseosa	Rubber rabbitbrush	N
Eriogonum fasciculatum var. *polifolium*	California buckwheat	N
Erodium cicutarium	Redstem filaree	I[2]
Eschscholzia californica	California poppy	N
Euphorbia albomarginata	Rattlesnake weed	N
Helianthus annuus	Hairy leaved sunflower	N
Hordeum murinum	Foxtail barley	I[2]
Lasthenia californica	California goldfields	N
Lupinus bicolor	Miniature lupine	N
Lupinus concinnus	Bajada lupine	N
Malacothrix sp.	Desert dandelion	N
Marah fabacea	California man-root	N
Marrubium vulgare	White horehound	I[2]
Matricaria discoidea	Pineapple weed	N
Mirabilis sp.	Four-o-clock	N
Oenothera californica	California evening primrose	N
Phacelia ciliata	Great Valley phacelia	N
Pectocarya penicilliata	Winged combseed	N

TABLE A-1: Plant Species Observed Within the Study Area, *continued*

Peritoma arborea	Bladderpod	N
Plagiobothrys canescens	Valley popcorn	N
Populus fremontii	Fremont cottonwood	N
Prunus persica	Peach	I
Salix exigua	Narrowleaf willow	N
Salsola tragus	Russian thistle	I[2]
Schismus barbatus	Common Mediterranean grass	I[2]
Sisymbrium sp.	Mustard	I
Stipa sp.	Needlegrass	N
Tamarix sp.	Tamarisk	I[2]
Typha sp.	Cattail	N
Xanthium strumarium	Cocklebur	N

[1] Source: Cal-IPC 2017.
[2] Species listed as limited, moderate, or high invasiveness by Cal-IPC for the Mojave Desert region.

TABLE A-2: Wildlife Species Observed Within the Study Area

Scientific Name	Common Name	Regulatory Status*
Reptiles		
Crotalus scutulatus scutulatus	Northern Mojave rattlesnake	
Uta stansburiana elegans	Western side-blotched lizard	
Birds		
Accipiter cooperii	Cooper's hawk	
Buteo jamaicensis	Red-tailed hawk	
Callipepla californica	California quail	
Cathartes aura	Turkey vulture	
Charadrius vociferus	Killdeer	
Chondestes grammacus	Lark sparrow	
Circus cyaneus	Northern harrier	
Corvus corax	Common raven	
Eremophila alpestris actia	California horned lark	WL
Falco sparverius	American kestrel	
Geococcyx californianus	Greater roadrunner	
Hirundo rustica	Barn swallow	
Lanius ludovicianus	Loggerhead shrike	CSC
Mimus polyglottos	Northern mockingbird	
Phalacrocorax auritus	Double-crested cormorant	
Sayornis nigricans	Black phoebe	
Streptopelia decaocto	Eurasian collared dove	
Sturnella neglecta	Western meadowlark	
Tyrannus verticalis	Western kingbird	
Xanthocephalus xanthocephalus	Yellow-headed blackbird	CSC
Zenaida macroura	Mourning dove	
Zonotrichia leucophrys	White-crowned sparrow	
Mammals		
Canis familiaris	Domestic dog	
Canis latrans	Coyote	
Dipodomys panamintinus	Panamint kangaroo rat	
Lepus californicus	Black-tailed jackrabbit	
Neotoma lepida	Desert wood rat	
Otospermophilus beecheyi	California ground squirrel	
Sylvilagus audubonii	Desert cottontail	

*Source: CDFW 2017d.

Status Definitions:

CSC = California Species of Concern.

WL = CDFW Watch List

Appendix B:
Site Photographs (Spring 2017)

Photograph 1: View of the fallowed orchard in the northwest corner of the Study Area. Facing west from the middle of the orchard. March 30, 2017.

Photograph 2: View the integration between the fallow orchard and fiddleneck (*Amsinkia* spp.) fields to the south. Facing east from the southwest corner of the orchard. March 30, 2017.

Photograph 3: View of fiddleneck field habitat. Facing north. March 31, 2017.

Photograph 4: View of fiddleneck fields integrating with rubber rabbitbrush (*Ericameria nauseosa*) scrub. Facing southwest from Avenue A at the northwest corner of the eastern fallow orchard. March 30, 2017.

Photograph 5: View of rubber rabbitbrush scrub habitat. Facing southeast. March 30, 2017.

Photograph 6: View of rubber rabbitbrush scrub with fiddleneck dominated understory at the southwest corner of the Study Area. Facing northeast. March 31, 2017.

Photograph 7: View of non-native annual grassland habitat. Facing east from 280th Street West.

Photograph 8: View of Feature 1. Facing northwest from the southeast corner of the potential wetland feature. Narrowleaf willow (*Salix exigua*) visible on the left. Discharge pipe is located behind the cottonwood (*Populus fremontii*) at the top left. March 30, 2017.

Photograph 9: View of the discharge pipe feeding Feature 1. Facing northeast. March 30, 2017.

Photograph 10: Close-up view of emergent vegetation within Feature 1. Facing north from the south bank of the feature. March 31, 2017.

Photograph 11: View of Feature 2. Facing south from the north edge of the potential seasonal wetland feature. March 30, 2017.

Photograph 12: View of soil cracking in Feature 2. March 30, 2017.

Photograph 13: View of Feature 2. Facing north-northwest from the southern edge of the feature. March 30, 2017.

Photograph 14: View of a representative retention basin. Facing southeast from the northwest corner of the feature. March 30, 2017.

Photograph 15: View of the northern pair of culverts that convey water under 300th Street West into Drainage 1. Facing east/upstream from the plunge pool. March 31, 2017.

Photograph 16: View of the southern pair of culverts that convey water under 300th Street West into Drainage 1. Evidence of direct run-off from the roadway is visible to the left of the culverts. Facing east/upstream from the drainage. March 31, 2017.

Photograph 17: View downstream from the culverts in Drainage 1. Facing southeast. March 31, 2017.

Photograph 18: View of Drainage 1 as it crosses an existing access road. Facing southwest/downstream. March 31, 2017.

Photograph 19: View of a portion of Drainage 1 where the banks are V-shaped and more defined. Facing southeast/downstream. March 31, 2017.

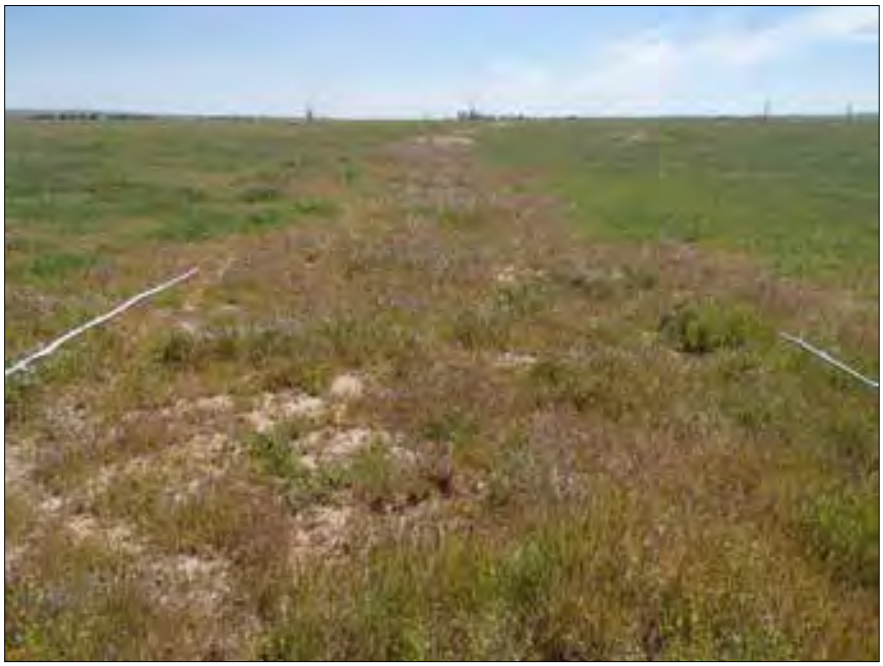
Photograph 20: View of Drainage 1 in an area where the channel is wide, flat, and has undefined banks, shortly before flows dissipate into the adjacent rubber rabbitbrush scrub. Facing southeast/downstream. March 31, 2017.

Photograph 21: View of the upstream end of Drainage 2, where flows from the roadway enter the channel. Facing north/downstream from the road. April 4, 2017.

Photograph 22: View of V-shaped, intermittently vegetated banks typical of the upstream portion of Drainage 2. Facing south/upstream from the constructed road crossing. April 4, 2017.

Photograph 23: View of one of several plunge pool areas along Drainage 2. Facing north/upstream from the channel. April 4, 2017.

Photograph 24: View of Drainage 2 where it is wide and relative flat. Drift deposits caught on the shrubs are visible. View northeast/downstream. April 4, 2017.



Photograph 25: View of Drainage 2 as it heads east across non-native annual grassland habitats. View east/downstream. April 4, 2017.

Photograph 26: View of Drainage 2 as it approaches 280th Street West and enters an abrupt, deep channel. Facing east/downstream. April 4, 2017.

Photograph 27: View of the downstream end of Drainage 2 within the Study Area, where the drainage crosses 280th Street West. Facing west/upstream from 280th Street West. April 4, 2017.

Photograph 28: View of the in-construction loggerhead shrike (*Lanius ludovicianus*) nest. March 30, 2017.

Photograph 29: View of large saltbush (*Atriplex* sp.) where loggerhead shrike nest was located. Facing east. March 30, 2017.

Photograph 30: View of an active common raven nest (*Corvus corax*) located above a transformer on a power pole with the Study Area. One adult was observed on the nest. Biologists were not able to determine whether the nest contained any eggs or chicks. March 30, 2017.

Photograph 31: View of a potentially suitable burrowing owl burrow, located within fiddleneck fields in the Study Area. March 31, 2017.

Photograph 32: View of tamarisk (*Tamarix* sp.) stands on the south side of the California Aqueduct, where a mixed flock of tricolored blackbirds (*Agelaius tricolor*) and yellow-headed blackbirds (*Xanthocephalus xanthocephalus*) were observed. March 31, 2017.

Appendix C:
Special-Status Species Not Observed But With CNDDB Records In the Vicinity of the Study Area

TABLE C-1: Special-Status Plant Species Not Observed But With CNDDB Records In the Vicinity of the Study Area

Common Name	Scientific Name	Regulatory Status*	Blooming Period	Habitat Requirements	Site Suitability	Potential to Occur
Plants						
Round-leaved filaree	*California macrophylla*	CRPR 1B.2	Mar-Jul	Open sites, cismontane woodland and valley and foothill grassland on clay or occasionally serpentine soils at elevations up to 1,200 m (CNPS 2017, Jepson 2017).	Suitable clay or serpentine soils are not present within the Study Area. Nearest occurrence is located in the foothills approximately 1.87 miles southwest of the Study Area and was recorded in 2004 (CDFW 2017a).	Low
Fort Tejon woolly sunflower	*Eriophyllum lanatum* var. *hallii*	CRPR 1B.1	Jun-Jul	Dry sites in chaparral and cismontane woodland habitats at elevations from 1,200 to 1,500 m (CNPS 2017, Jepson 2017).	Study Area does not occur at suitable elevations, and suitable chaparral and woodland habitats are not present.	No
San Bernardino aster	*Symphyotrichum defoliatum*	CRPR 1B.2	Jul-Nov	Disturbed places and near ditches, streams, and springs, in vernally mesic valley and foothill grassland, cismontane woodland, coastal scrub, lower montane coniferous forest, meadow and seep, and marsh and swamp habitats, at elevations up to 2,050 m (CNPS 2017, Jepson 2017).	Suitable mesic habitats are not available in the Study Area. Nearest occurrence is located in the foothills approximately 10.83 miles west of the Study Area and was recorded in 1939 (CDFW 2017a).	No
Greata's aster	*Symphyotrichum greatae*	CRPR 1B.3	Aug-Oct	Damp places in canyons and mesic areas in broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, and riparian woodland habitats at elevations from 300-2,000 m (CNPS 2017, Jepson 2017).	Suitable mesic habitats and woodland and chaparral habitats are not present within the Study Area. Nearest occurrence is located in the foothills approximately 10.76 miles south of the Study Area and was recorded in 2001 (CDFW 2017a).	No

TABLE C-1: Special-Status Plant Species Not Observed But With CNDDB Records In the Vicinity of the Study Area, *continued*

Common Name	Scientific Name	Regulatory Status*	Blooming Period	Habitat Requirements	Site Suitability	Potential to Occur
Peirson's morning glory	*Calystegia peirsonii*	CRPR 4.2	May-Jun	Rocky slopes in chaparral, chenopod scrub, cismontane woodland, coastal scrub, lower montane coniferous forest, and valley and foothill grassland habitats at elevations from 1,000-1,500 m (CNPS 2017, Jepson 2017).	Study Area does not occur at suitable elevations. Nearest occurrence is located in the foothills, approximately 9.21 miles southeast of the Study Area and was recorded in 1979.	No
Tehachapi monardella	*Monardella linoides* ssp. *oblonga*	CRPR 1B.3	Jun-Aug	Gravelly, dry slopes and flats in chaparral, lower and upper montane coniferous woodland, and pinyon and juniper woodland habitats at elevation from 1,500-2,600 m (Jepson 2017, CNPS 2017).	Study Area does not occur at suitable elevations and suitable chaparral and woodland habitats are not present.	No
Tejon poppy	*Eschscholzia lemmonii* ssp. *kernensis*	CRPR 1B.1	Mar-Apr	Open grassland habitats at elevations from 200-1,000 m (Jepson 2017, CNPS 2017).	Potentially suitable habitats do occur within the Study Area; however, this species is restricted in range to parts of Kern County (CSU Stanislaus 2017). Nearest occurrence is located in the foothills in the Burnt Peak Quad (specific location not available) approximately 3 miles southeast of the Study Area and was recorded in 2014 (CDFW 2017a).	No
Tracy's eriastrum	*Eriastrum tracyi*	SR, CRPR 3.2	May-Aug	Open areas on shale or alluvium in open cismontane woodland, chaparral, and valley and foothill grassland habitats at elevations from 400 -1,000 m (Jepson 2017, CNPS 2017).	Study Area does contain potentially suitable habitats and soils. This species is not known to occur within Los Angeles County (CNPS 2017). Nearest occurrence is located in the foothills approximately 8.90 miles west of the Study Area and was recorded in 2007. (CDFW 2017a).	Low
Madera leptosiphon	*Leptosiphon serrulatus*	CRPR 1B.2	Apr-May	Openings in cismontane woodland, lower montane coniferous forest, and chaparral habitats at elevations from 300-1,300 m (Jepson 2017, CNPS 2017).	Suitable chaparral and woodland habitats are not present within the Study Area. Nearest occurrence is in the mountains approximately 5.48 miles north of the Study Area and was recorded in 1935 (CDFW 2017a).	No

TABLE C-1: Special-Status Plant Species Not Observed But With CNDDB Records In the Vicinity of the Study Area, *continued*

Common Name	Scientific Name	Regulatory Status*	Blooming Period	Habitat Requirements	Site Suitability	Potential to Occur
Baja navarretia	*Navarretia peninsularis*	CRPR 1B.2	Jun-Aug	Mesic areas in meadows and seeps, openings in chaparral and open forest habitats, including lower montane coniferous forest and pinyon and juniper woodland, at elevations from 1,400-2,300 m (Jepson 2017, CNPS 2017).	Suitable mesic areas and suitable forest, woodland, and chaparral habitats do not occur, and the Study Area does not occur at suitable elevations. Nearest occurrence is located in the foothills, approximately 6.57 miles west of the Study Area and was recorded in 2004 (CDFW 2017a).	No
Piute Mountains navarretia	*Navarretia setiloba*	CRPR 1B.1	Apr-Jul	Depressions in clay or gravelly loam soils in cismontane woodland, pinyon and juniper woodland, and valley and foothill grassland habitats at elevations from 500-2,100 m (Jepson 2017, CNPS 2017).	Study Area contains potentially suitable habitats, although soils tend to be sandy or sandy loam. Nearest occurrence is located in the foothills, approximately 5.99 miles west from the Study Area and was recorded in 2004 (CDFW 2017a).	Low
Umbrella larkspur	*Delphinium umbracualorum*	CRPR 1B.3	Apr-Jun	Moist oak forest at elevations from 400-1,600 m (Jepson 2017).	Suitable oak forest is not present within the Study Area. Nearest occurrence is located in the foothills, approximately 12.20 miles northwest from the Study Area and was recorded in 2007 (CDFW 2017a).	No
Mt. Gleason paintbrush	*Castilleja gleasonii*	CRPR 1B.2	May-Jun	Cliffs and rocky slopes on granitic soils in open yellow-pine forest, chaparral, lower montane coniferous forest, and pinyon and juniper woodland habitats, at elevations from 1,100-1,200 m (Jepson 2017, CNPS 2017).	Study Area does not occur at suitable elevations, and suitable forest, woodland, and chaparral habitats are not present. Nearest occurrence is located in the foothills, approximately 6.90 miles southwest of the Study Area and was recorded in1998 (CDFW 2017a).	No
Calico monkeyflower	*Mimulus pictus*	CRPR 1B.2	Mar-May	Bare, sunny, shrubby areas, disturbed areas, and around granite outcrops in cismontane woodland and broadleaf upland forest at elevations from 135-1,250 meters (Jepson 2017, CNPS 2017).	Suitable woodland and forest habitats are not present within the Study Area. Nearest occurrence is located in the foothills, approximately 7.16 miles northwest from the Study Area and was recorded in 2007 (CDFW 2017a).	No

TABLE C-1: Special-Status Plant Species Not Observed But With CNDDB Records In the Vicinity of the Study Area, *continued*

Common Name	Scientific Name	Regulatory Status*	Blooming Period	Habitat Requirements	Site Suitability	Potential to Occur
Mt. Pinos onion	*Allium howellii* var. *clokeyi*	CRPR 1B.3	May-Jun	Open slopes in Great Basin scrub, sagebrush scrub, meadows and seeps, and pinyon and juniper woodland habitats at elevations from 1,300-1,850 m. Occurs on vertic clay soils. (Jepson 2017, CNPS 2017).	Study Area does not occur at suitable elevations, and suitable scrub, meadow and seep, and woodland habitats are not present. Suitable clay soils are not present. Nearest occurrence is approximately 4.2 miles west of the Study Area in the foothills (CDFW 2017a).	No
Tehachapi buckwheat	*Eriogonum callistum*	CRPR 1B.1	Spring-summer	Open limestone outcrops and ridges in chaparral habitats at elevations from 1,400-1,500 m (Jepson 2017, CNPS 2017).	Study Area does not occur at suitable elevations, and suitable chaparral habitats are not present.	No
Palmer's mariposa lily	*Calochortus palmeri* var. *palmeri*	CRPR 1B.2	May-Jul	Meadows and seeps, and vernally moist places in yellow-pine forest and chaparral habitats at elevations from 1,200-2,200 m (CNPS 2017, Jepson 2017).	Study Area does not occur at suitable elevations, and suitable forest and chaparral habitats are not present.	No
Slender mariposa lily	*Calochortus clavatus* var. *gracilis*	CRPR 1B.2	Mar-Nov	Shaded foothill canyons in chaparral, coastal scrub, and valley and foothill grassland habitats at elevations up to 1,000 m (CNPS 2017, Jepson 2017).	Suitable foothill canyon areas are not present. Nearest occurrence is located in the foothills approximately 7.49 miles southwest of the Study Area and was recorded in 2009 (CDFW 2017a).	No

*Source: CDFW 2017c.

Status Definitions:
FE = Federally Endangered.
SE = State Endangered.

CRPR = California Rare Plant Rank (CNPS 2017)
1A = Presumed extirpated in California and either rare or extinct elsewhere.
1B = Rare, threatened, or endangered in California and elsewhere.
2B = RAre, threatened, and endangered in California, but more common elsewhere.
3 = Plants about which more information is needed.
4 = Limited distribution – a watch list.
.1 = Seriously threatened in California.
.2 = Moderately threatened in California.
.3 = Not very threatened in California.

TABLE C-2: Sensitive Communities Not Observed But With CNDDB Records in the Vicinity of the Study Area

Community Name	Regulator y Status	Potential to Occur
Valley Needlegrass Grassland	CDFW Sensitive Natural Community	No. Although individual needlegrass (*Stipa* sp.) were observed, in no area did needlegrass constitute more than 10 percent of relative cover.
Valley Oak Woodland	CDFW Sensitive Natural Community	No
Wildflower Field	CDFW Sensitive Natural Community	No. Although individual California poppies were observed, in no area did California poppies constitute more than 1 to 5 percent of relative cover.
Southern Riparian Forest	-	No
Southern Coast Live Oak Riparian Forest	-	No
Southern Cottonwood Willow Riparian Forest	CDFW Sensitive Natural Community	No
Sycamore Alder Riparian Woodland	CDFW Sensitive Natural Community	No
Southern Riparian Scrub	-	No

TABLE C-3: Special-Status Wildlife Species Not Observed But With CNDDB Records In the Vicinity of the Study Area

Common Name	Scientific Name	Regulatory Status*	Nesting/ Breeding Period	Habitat Requirements	Site Suitability	Potential to Occur
Invertebrates						
Crotch bumble bee	*Bombus crotchii*	SA	-	Inhabits open grassland and scrub habitats. Annual colonies nest underground. Food plants include milkweed (*Asclepias* spp.), pincushion flowers (*Chaenactis* spp.), lupines (*Lupinus* spp.), clover (*Medicago* spp.), phacelia (*Phacelia* spp.), and sages (*Salvia* spp.) (IUNC 2016).	Suitable food plants do occur within the Study Area. Species was not observed during surveys. Nearest occurrence is approximately 0.35 miles southeast of the Study Area and was recorded in 1976 (CDFW 2017a).	Low
Desert cuckoo wasp	*Ceratochrysis longimala*	SA	-	Little information available specific to this species. *Ceratochrysis* genus wasps are generally solitary parasitoids of other Hymenoptera species, including solitary bees, predatory wasps, and sawflies and can be found throughout California and North America (BugGuide 2017).	Potentially suitable host species may occur but were not observed during surveys. Species was not observed during surveys. Nearest occurrence is approximately 12.75 miles southwest of the Study Area, on the west side of Interstate 5 (CDFW 2017a).	No
San Emigdio blue butterfly	*Plebejus emigdionis*	SA	-	Inhabits shadscale (*Atriplex canescens*) scrub habitats in desert canyons and near washes. Three adult flights from April through September. Eggs are laid on and caterpillars feed on leaves of the shadscale (Butterflies and Moths of North America 2017).	Shadscale scrub habitat does not occur within the Study Area. Nearest occurrence is located in the foothills approximately 12.12 miles to the west of the Study Area and was recorded in 2007 (CDFW 2017a).	No

TABLE C-3: Special-Status Wildlife Species Not Observed But With CNDDB Records In the Vicinity of the Study Area, *continued*

Common Name	Scientific Name	Regulatory Status*	Nesting/ Breeding Period	Habitat Requirements	Site Suitability	Potential to Occur
Amphibians						
Tehachapi slender salamander	*Batrachoseps stebbinsi*	ST	Nov – Apr, during rainy season	Moist canyons and ravines in oak and mixed woodlands within arid and semi-arid locations. Shelters under rocks, logs, and other debris in moist areas; favors areas with abundant leaf litter. Occurs from 610 to 1,400 meters elevation (CalHerps 2017).	Suitable moist canyon and ravine areas and suitable woodland habitats do not occur within the Study Area. Study Area is located outside the species' range (CDFW 2017a).	No
Yellow-blotched salamander	*Ensatina eschscholtzii croceator*	WL	Fall and Spring	Inhabits relatively cool, moist places in evergreen and deciduous forests. Utilize refugia including rocks, logs, and other surface debris, and typically occur near streams and creeks. Adults are active on rainy, wet nights when temperatures are moderate, and stay underground during hot, dry periods (CalHerps 2017).	Study Area occurs outside the species' range. Suitable woodland habitat and consistently moist areas, as well as semi-permanent or permanent streams, do not occur.	No

TABLE C-3: Special-Status Wildlife Species Not Observed But With CNDDB Records In the Vicinity of the Study Area, *continued*

Common Name	Scientific Name	Regulatory Status*	Nesting/ Breeding Period	Habitat Requirements	Site Suitability	Potential to Occur
Arroyo toad	*Anaxyrus californicus*	FE, CSC	March-July	Inhabits semi-arid regions near washes and intermittent streams in valley-foothill and desert riparian, desert wash, palm oasis, and Joshua tree, mixed chaparral, and sagebrush habitats. Occurs at elevations up to 1,950 m. Breeding occurs in quiet parts of clear streams or shallow ponds. Requires exposed sandy streambeds with stable terraces for burrowing, and areas of quiet water or pools free from predatory fish species, with sandy or gravelly substrate and clear, silt-free water for breeding (CalHerps 2017, CDFW 2017b).	Study Area does not contain suitable clear, still or slow-moving waters for breeding or sandy terraces for burrowing. Study Area occurs outside the species' range (CDFW 2017a).	No
Western spadefoot	*Spea hammondii*	CSC	Late winter – end of March	Inhabits grassland and valley-foothill woodland habitats at elevations from sea level to 1,363 m. Adults are rarely aboveground, residing in burrows they dig themselves or in small mammal burrows. Emerge at night during rain events or high humidity conditions to breed in vernal pools (CDFW 2017b).	Study Area does contain potentially suitable grassland habitats; however, Study Area occurs outside species' range (CDFW 2017a).	No

TABLE C-3: Special-Status Wildlife Species Not Observed But With CNDDB Records In the Vicinity of the Study Area, *continued*

Common Name	Scientific Name	Regulatory Status*	Nesting/ Breeding Period	Habitat Requirements	Site Suitability	Potential to Occur
Reptiles						
Coast horned lizard	*Phrynosoma blainvillii*	SSC	-	Inhabits open country, especially sandy areas, washes, flood plains, and wind-blown deposits, chiefly below 900 m. Occurs is valley-foothill hardwood, conifer, and riparian, pine-cypress, and juniper habitats, and annual grasslands. Ants an important food source, but other insects are also consumed (CDFW 2017b).	Potentially suitable habitats do occur, but open areas are generally limited. Grassland habitats within the Study Area tend to be densely vegetated, and scrub habitats contain a dense herbaceous understory. Nearest occurrence is near the edge of the foothills approximately 2.79 miles to the north of the Study Area and was recorded in 2012 (CDFW 2017a).	No
Coastal whiptail	*Aspidoscelis tigris stejnegeri*	SSC	-	Diurnal, wary, very active. Inhabits a variety of habitats, typically hot, dry, open areas with sparse foliage. Occurs in chaparral, woodland, and riparian habitats. Elevation from sea level to 1,800 m (CalHerps 2017).	Suitable habitats may occur within the Study Area, although dense herbaceous cover typical of the Study Area is not favored by this species. Nearest occurrence is located in the foothills approximately 6.65 miles to the west of the Study Area and was recorded in 1997 (CDFW 2017a).	No

TABLE C-3: Special-Status Wildlife Species Not Observed But With CNDDB Records In the Vicinity of the Study Area, *continued*

Common Name	Scientific Name	Regulatory Status*	Nesting/ Breeding Period	Habitat Requirements	Site Suitability	Potential to Occur
Silvery legless lizard	*Anniella pulchra pulchra*	CSC	Breeding from early spring to Jul, young born Sep-Nov	Secretive, fossorial lizard. Occurs in areas with warm, moist, loose sandy or organic soils and sparse vegetation in oak woodland, chaparral, riparian woodland, oak-pine woodland, coastal dune, valley-foothill and desert scrub habitats at elevations from sea level to 1,800 m. Typically found in areas with leaf litter under trees and bushes in sunny locations. Forages in sand and leaf litter for insect prey (CalHerps 2017, CDFW 2017b).	Suitable loose, sandy soils are uncommon with the Study Area. Study Area occurs outside species' range (CDFW 2017a).	No
Blunt-nosed leopard lizard	*Gambelia sila*	FE, SE, FP	Breeding starts in May; eggs hatch from July-Aug	Semiarid grassland, alkali flats, and washes from 30-730 meters. Prefers flat areas with open space for running over densely vegetated areas. Primarily diurnal. Utilizes small mammal burrows for cover and shelter (CalHerps 2017, CDFW 2017b).	Study Area does not occur at suitable elevations, and is outside species' range (CDFW 2017a)	No
Two-striped gartersnake	*Thamnophis hammondii*	CSC	-	Associated with permanent or semi-permanent bodies of water in a variety of habitats from sea level to 2,400 m. Diurnal species that utilizes mammal burrows and other holes, crevices, and surface objects as nocturnal hides. Prefers densely vegetated banks for basking, will retreat quickly to water if disturbed (CDFW 2017b).	Suitable permanent or semi-permanent waters with vegetation banks are not present within the Study Area. Study Area occurs outside species' range (CDFW 2017a).	No

TABLE C-3: Special-Status Wildlife Species Not Observed But With CNDDB Records In the Vicinity of the Study Area, *continued*

Common Name	Scientific Name	Regulatory Status*	Nesting/ Breeding Period	Habitat Requirements	Site Suitability	Potential to Occur
San Bernardino ring-necked snake	*Diadophis punctatus modestus*	SA	-	Common but secretive species that occurs in moist habitats including wet meadows, rocky hillsides, gardens, farmlands, and grassland, chaparral, mixed coniferous forests and woodland habitats at elevations from sea level to 2,133 m. Feeds on small amphibians, snakes, lizards, worms, slugs, and insects (CalHerps 2017, CDFW 2017d).	Suitable moist habitats do not occur within the Study Area, although grassland habitats are present. Nearest occurrence is located in the foothills, approximately 11.01 miles to the northwest of the Study Area and was recorded in 2000 (CDFW 2017a).	No
Western pond turtle	*Emys marmorata*	SSC	--	Inhabits permanent and nearly permanent waters at elevations up to 1,432 m. Associated with ponds, streams, irrigation ditches, or permanent pools along intermittent streams in a variety of habitats. Require vegetation and open water for cover and basking sites, including partially submerged logs, rocks, and floating vegetation mats (CDFW 2017d).	Suitable permanent or nearly permanent waters do not occur within the Study Area. Nearest occurrence is located approximately 8.38 miles to the west of the Study Area and was recorded in 2012 (CDFW 2017a).	No

TABLE C-3: Special-Status Wildlife Species Not Observed But With CNDDB Records In the Vicinity of the Study Area, *continued*

Common Name	Scientific Name	Regulatory Status*	Nesting/ Breeding Period	Habitat Requirements	Site Suitability	Potential to Occur
Desert tortoise	*Gopherus agassizii*	FT, ST	Mar-Oct	Inhabits sandy or gravelly desert habitats, washes, oasis, canyons, alluvial fans, where suitable friable soils occur. Spend the majority of its life in burrows it digs itself, even during seasons of activity. Feeds on herbaceous vegetation, including grasses, flowers of annuals, cactus, herbs, and legumes. Agriculture renders habitat unsuitable (USFWS 2011).	Study Area is located outside the USFWS accepted range for this species (USFWS 2017d), and outside the range of suitable habitat modelled by Nussear *et al.* (2009). Nearest occurrence is located approximately 10.47 miles northeast of the Project and was recorded in 2010. The next nearest occurrence is located approximately 20.9 miles northeast of the Project and was recorded in 2006 (CDFW 2017a).	No
Birds						
Prairie falcon	*Falco mexicanus*	WL, BCC (nesting)	Mar – Jul	Dry, open grasslands, shrub-steppe, deserts and other open areas up to approximately 3,050 meters elevation. Requires cliffs for nesting sites, generally south-facing and up to approximately 152 meters high. May travel more than 12.5 miles from nest (CDFW 2017b, All About Birds 2017).	Suitable nesting habitat does not occur within the Study Area. Suitable foraging habitat may occur. Nearest occurrence is in the foothills, in the Liebre Mtn Quad (specific location not available) approximately 3.11 miles to the south of the Study Area and was recorded in 1980 (CDFW 2017a).	Moderate, foraging only

TABLE C-3: Special-Status Wildlife Species Not Observed But With CNDDB Records In the Vicinity of the Study Area, *continued*

Common Name	Scientific Name	Regulatory Status*	Nesting/ Breeding Period	Habitat Requirements	Site Suitability	Potential to Occur
Ferruginous hawk	*Buteo regalis*	WL, BCC (wintering)	Wintering only in California	Open grasslands, sagebrush flats, desert scrub, low foothills surrounding valleys. Perches on power poles and on ground. Breeds in trees near streams, on steep slopes, or on mounds in open desert. Avoids urban areas (CDFW 2017b, All About Birds 2017).	Study Area contains potentially suitable foraging habitat. Nesting unlikely as trees within the Study Area are mostly dead and terrain is flat throughout the site. Nearest occurrence is in the foothills, approximately 4.10 miles to the west of the Study Area and was recorded in 2004 (CDFW 2017a).	Moderate, foraging only
California condor	*Gymnogyps californianus*	FE, SE, FP	Jan- Apr	Nest in natural cavities and caves in cliffs and in large trees within scrubby chaparral and forested mountain habitats up to 1,830 m elevation. Forage for carrion in open terrain of foothill grasslands, chaparral habitats, and oak savannahs, May fly more than 100 miles per day while foraging (All About Birds 2017, USFWS 1996).	Suitable nesting habitat does not occur within the Study Area. Study Area does occur within foraging range for this species, and individuals may traverse or forage within the Study Area. Nearest occurrence is located in the mountains approximately 7.17 miles to the north of the Study Area and was recorded in 1976 (CDFW 2017a).	Low, foraging only

TABLE C-3: Special-Status Wildlife Species Not Observed But With CNDDB Records In the Vicinity of the Study Area, *continued*

Common Name	Scientific Name	Regulatory Status*	Nesting/ Breeding Period	Habitat Requirements	Site Suitability	Potential to Occur
Bald eagle	*Haliaeetus leucophalus*	SE, FP, BCC	Feb-Jul	Yearround resident or uncommon winter migrant of large, old-growth tree stands and snags in remote, mixed stands near large bodies of water or rivers. May winter in dry, open uplands with access to water. Preferably nest in tall, sturdy conifers, but may also use deciduous trees, mangroves, or cactus which afford good visibility and easy flight access. Feeds mainly on fish, but also forages for mammals and waterfowl (CDFW 2017b, All About Birds 2017).	Suitable water sources do not occur within the Study Area and are uncommon in the region. Suitable stands for nesting do not occur within the Study Area. Study Area occurs outside species' range (CDFW 2017a).	No
Golden eagle	*Aquila chrysaetos*	FP, WL, BCC	Jan-Aug	Uncommon permanent resident and migrant in California. Occurs in rolling hills and mountainous areas, sage-juniper flats, and desert habitats from sea level up to 3,505 m. Feeds on lagomorphs and rodents, other small mammals, birds, reptiles, and some carrion. Requires open terrain for hunting, including grasslands, deserts, savannahs, and early successional forest and shrub habitats. Nests on cliffs; may use large trees in otherwise open areas (CDFW 2017d).	Study Area contains potentially suitable foraging habitat and support suitable prey species. Suitable nesting habitat does not occur within the Study Area or in the immediate vicinity. Nearest occurrence is located in the foothills approximately 7.73 miles to the west of the Study Area and was recorded in 2004 (CDFW 2017a).	Low, foraging only

TABLE C-3: Special-Status Wildlife Species Not Observed But With CNDDB Records In the Vicinity of the Study Area, *continued*

Common Name	Scientific Name	Regulatory Status*	Nesting/ Breeding Period	Habitat Requirements	Site Suitability	Potential to Occur
Purple martin	*Progne subis*	CSC	Apr-Aug	Rare summer resident in wooded, low-elevation habitats throughout California. Inhabits valley foothill and montane hardwood and hardwood-conifer forest and riparian habitats, and other forest and woodland habitats. Absent from higher desert regions except as a rare migrant (CDFW 2017d)	Study Area occurs outside species' range.	No
Coastal California gnatcatcher	*Polioptila californica californica*	FT, CSC, WL	Feb-Jul	Small, non-migratory resident of Pacific coastal regions of southern California and northern Baja California, Mexico. Occurs in or near coastal scrub habitats, favoring areas with low (less than 1 meter) shrub and sub-shrub, often drought-deciduous, species. Includes coastal sage and coastal succulent habitats. May occur in neighboring habitats, especially outside breeding season. Nests from late February through July. Nests often located approximately 1 meter off the ground in California sagebrush (USFWS 2010).	Suitable coastal scrub habitats do not occur. Study Area occurs outside species' range (CDFW 2017a).	No

TABLE C-3: Special-Status Wildlife Species Not Observed But With CNDDB Records In the Vicinity of the Study Area, *continued*

Common Name	Scientific Name	Regulatory Status*	Nesting/ Breeding Period	Habitat Requirements	Site Suitability	Potential to Occur
Yellow warbler	*Dendroica petechia*	CSC, BCC	April-Aug	Summer resident through California at elevations of 2,500-8,000 m. Resides in medium-density woodlands and forests with a heavy brush understory in the breeding season. Typically occurs in low, open-canopy riparian habitats and montane shrubbery in open conifer forests (CDFW 2017b).	Suitable riparian woodland or montane shrub habitats are not present within the Study Area. Study Area occurs outside species' range (CDFW 2017a).	No
Grasshopper sparrow	*Ammodramus savannarum*	CSC	Apr-Jul	Uncommon and local summer resident in foothills and lowlands west of the Cascade-Sierra Nevada crest. Typically occurs in dry, dense grasslands with high species diversity and scattered shrubs.	Study Area occurs outside species' range. Potentially suitable, though low quality, grassland habitat does occur within the Study Area. Species was not observed during surveys. Study Area occurs outside species' range (CDFW 2017a).	No
Tri-colored blackbird	*Agelaius tricolor*	SC, CSC, BCC (nesting colony)	Apr-July	Breeds in colonies near fresh water, often in emergent vegetation, but also in thickets of willow, blackberry, wild rose, and tall herbs. Feeds in grasslands, agricultural lands, flooded fields, and pond edges. May travel more than six miles to forage (CDFW 2017b).	Suitable nesting habitat does not occur within the Study Area, but is found in the vicinity. Species observed in a large mixed flock on the south side of the California Aqueduct during surveys. Nearest occurrence is a nesting colony located approximately 2.8 miles east of the Study Area and recorded in 2014 (CDFW 2017a).	Moderate to high, foraging only

TABLE C-3: Special-Status Wildlife Species Not Observed But With CNDDB Records In the Vicinity of the Study Area, *continued*

Common Name	Scientific Name	Regulatory Status*	Nesting/ Breeding Period	Habitat Requirements	Site Suitability	Potential to Occur
Swainson's hawk	*Buteo swainsoni*	ST, BCC (nesting)	Late Mar-Aug	Uncommon summer resident. Inhabits and nests in open stands of trees in juniper-sage flats, riparian areas, and oak savanna, as well as scattered stands of trees in agricultural areas. Forages in adjacent grasslands or suitable grain or alfalfa fields, or livestock pastures. Feeds on a variety of vertebrates, particularly small mammals, during the breeding season, and a large number of insects when not breeding (CDFW 2017b, Cornell 2017).	Suitable nesting habitat does not occur within the Study Area. Suitable foraging habitat consisting of annual grassland habitats does occur. Species was not observed during surveys. The CNDDB does not contain records for this species within the Project quadrangle or any of the adjacent quadrangles. Nearest occurrence is located approximately 17.5 miles east of the Study Area, recorded in 1999 and 2011 (CDFW 2017a).	Low to moderate
Mammals						
American badger	*Taxidea taxus*	CSC	Breeds summer/early fall, young born in Mar-Apr	Found in open areas of herbaceous habitats, shrublands, and forests with dry, friable soils used for burrows. Preys mostly on burrowing rodents (CDFW 2017b).	Study Area does contain potentially suitable habitat and supports suitable prey species. Species or sign was not observed during surveys. Nearest occurrence is an undated record located approximately 2.7 miles northeast of the Study Area (CDFW 2017a).	Low to moderate

TABLE C-3: Special-Status Wildlife Species Not Observed But With CNDDB Records In the Vicinity of the Study Area, *continued*

Common Name	Scientific Name	Regulatory Status*	Nesting/ Breeding Period	Habitat Requirements	Site Suitability	Potential to Occur
Tehachapi pocket mouse	*Perognathus alticolus inexpectatus*	CSC	Unknown, but likely spring and summer	Native and non-native grasslands, Joshua tree woodland, pinyon-juniper woodland, and oak savannah, as well as chaparral and coastal sage habitats at lower elevations. Require loose, sandy soils for burrowing. Occurs at elevations from 1,067 to 1,829 m (BLM 2017).	Study Area does contain potentially suitable grassland habitats and friable soils are present. Study Area does not occur at suitable elevations. Nearest occurrence is approximately 0.65 miles south-southwest of the Study Area and was recorded in 1965 (CDFW 2017a).	No
San Joaquin pocket mouse	*Perognathus inornatus*	SA	Unknown, but likely spring and summer	Occurs in dry, open grasslands or scrub habitats on fine-textured soils at elevations from 350-600 m (CDFW 2017b).	Study Area does support potentially suitable grassland habitats and does contain suitable soils. However, Study Area does not occur at suitable elevations. Nearest occurrence is located in the foothills approximately 12.51 miles to the southwest of the Study Area and was recorded in 1989 (CDFW 2017a).	No

TABLE C-3: Special-Status Wildlife Species Not Observed But With CNDDB Records In the Vicinity of the Study Area, *continued*

Common Name	Scientific Name	Regulatory Status*	Nesting/ Breeding Period	Habitat Requirements	Site Suitability	Potential to Occur
Yuma myotis	*Myotis yumanensis*	SA	-	Found in open forests and woodlands in proximity of water sources, which are used as foraging sites and sources of drinking water. Occurs in a variety of habitats from sea level to 3,300 m. Roosts in caves, mines, crevices, and in buildings (CDFW 2017d).	Suitable forest and woodland habitats do not occur within the Study Area or adjacent to the Study Area. Suitable roosting sites are not available within the Study Area. Study Area occurs at far eastern edge of species' range (CDFW 2017a). Nearest occurrence is located in the mountains, approximately 11.37 miles to the west of the Study Area and was recorded in 1945 (CDFW 2017a).	No
Fringed myotis	*Myotis thysanodes*	SA	-	Widespread in California and potentially locally common, species occurs in a variety of habitats but prefers valley foothill hardwood and hardwood-conifer forests from 1,300-2,200 m. Migratory. Roosts in caves, mines, buildings, and crevices, forming separate groups of adults and subadults. Forages for beetles, as well as moths, arachnids, and orthopterans, in open habitats, areas of early successional stages vegetation near streams, lakes, and ponds. Requires access to drinking water (Animal Diversity Web 2017, CDFW 2017b).	Study Area does not occur at suitable elevations, and suitable woodland and forest habitats are not present. Study Area occurs at far eastern edge of species' range (CDFW 2017a). Nearest occurrence is located in the mountains, approximately 11.37 miles to the west of the Study Area and was recorded in 1945 (CDFW 2017a).	No

TABLE C-3: Special-Status Wildlife Species Not Observed But With CNDDB Records In the Vicinity of the Study Area, *continued*

Common Name	Scientific Name	Regulatory Status*	Nesting/ Breeding Period	Habitat Requirements	Site Suitability	Potential to Occur
Long-legged myotis	*Myotis volans*	SA	-	Common species in woodland and forest habitats above 1,200 m, and also occurs in chaparral, coastal scrub, Great Basin shrub, and arid grassland habitats from sea level to 3,600 m. Roosts primarily in trees during the day; caves and mines may be used at night. Forages for flying insects, primarily moths, over water, open habitats, and above the forest canopy. Requires access to drinking water (Animal Diversity Web 2017, CDFW 2017b).	Study Area does contain potentially suitable grassland habitat. Roosting trees are sparse within the Study Area, but may occur on the adjacent properties. Study Area occurs at far eastern edge of species' range (CDFW 2017). Nearest occurrence is located in the mountains, approximately 11.37 miles to the west of the Study Area and was recorded in 1945 (CDFW 2017a).	Low
Townsend's big-eared bat	*Corynorhinus townsendii*	SC, CSC	-	Found throughout California in all but subalpine and alpine habitats; most abundant in mesic habitats. Roosts include caves, mines, tunnels, buildings, or other human structures, and occasionally tree cavities, and are the most important limiting resource. Extremely sensitive to roost disturbance. Forage primarily on moths using echolocation; prefer to forage on habitat edges (CDFW 2017b, Zeiner *et al*. 1988–1990).	Suitable habitats may occur, but high quality foraging habitat consisting of habitat edges is scarce within the Study Area. Roosting sites are scarce within the Study Area, but may occur on adjacent properties. Nearest occurrence is located in the mountains, approximately 11.37 miles to the west of the Study Area and was recorded in 1945 (CDFW 2017a).	Low, likely foraging only

TABLE C-3: Special-Status Wildlife Species Not Observed But With CNDDB Records In the Vicinity of the Study Area, *continued*

Common Name	Scientific Name	Regulatory Status*	Nesting/ Breeding Period	Habitat Requirements	Site Suitability	Potential to Occur
Pallid bat	*Antrozous pallidus*	CSC	-	Found in deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting. Day roosts are caves, crevices, mines, and sometimes hollow trees and buildings. Roosts must protect bats from high temps; very sensitive to disturbance of roost sites. Forages over open ground, usually 0.5-2.5 m above ground level (CDFW 2017b, Zeiner *et al*. 1988–1990).	Study Area does contain potentially suitable habitat, although rocky areas for roosting do not occur. Buildings on adjacent properties may support roosting. Nearest occurrence is located in the mountains, approximately 11.37 miles to the west of the Study Area and was recorded in 1945 (CDFW 2017a).	Low
San Joaquin kit fox	*Vulpes macrotis mutica*	FE, ST	Feb-Sept	Annual grasslands and grassy stages of scrub habitats. Require loosely-textured, sandy and loamy soils in open, levels areas for digging burrows used for cover and breeding. May persist in urban areas and in edge habitats in agricultural areas. Active year-round, mostly nocturnal . Primarily carnivorous, taking jackrabbits, cottontails, and other rodents, as well as insects, reptiles, some birds, eggs, and some vegetation (CDFW 2017b, USFWS 1998a).	Potentially suitable habitat for kit foxes does occur within the Study Area, however the Study Area occurs outside this species' range (CDFW 2017a).	No

*Source: CDFW 2017d.
Status Definitions:
CSC = California Species of Concern.
FE = Federally Endangered.

FT = Federally Threatened.
FP = State Fully Protected.
SE = State Endangered.
ST = State Threatened.
SC = State Candidate.
SR = State Rare.
SA = CDFW Special Animal.
BCC = Bird of Conservation Concern (for the Sonoran and Mojave Desert BCR).

Appendix D:
California Native Species Field Survey Forms

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDB@wildlife.ca.gov

For Office Use Only
Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 03/30/2017

Clear Form

California Native Species Field Survey Form

Print Form

Scientific Name: Lanius ludovicianus

Common Name: Loggerhead shrike

Species Found? (●) Yes ( ) No _____ (if not found, why?)

Total No. Individuals: 1 Subsequent Visit? ( ) Yes (●) No

Is this an existing NDDB occurrence? _____ (Yes, Occ. #) [X] No [ ] Unk.

Collection? If yes: _____ (Number) _____ (Museum / Herbarium)

Reporter: Wynter Dawson
Address: 2400 Professional Parkway
Suite 100
E-mail Address: wynter.dawson@aecom.com
Phone: 720.281.0654

Plant Information
Phenology: _____ % vegetative _____ % flowering _____ % fruiting

Animal Information
1 # adults, 0 # juveniles, 0 # larvae, 0 # egg masses, 0 # unknown
[ ] wintering [ ] breeding [ ] nesting [ ] rookery [ ] burrow site [ ] lek [X] other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)
Western Antelope Valley, on an undeveloped lot immediately west of 260th Street West and south of Avenue A.

County: Los Angeles Landowner / Mgr: _____
Quad Name: La Liebre Ranch Elevation: 2,942 feet msl
T___ R___ Sec___, ___¼ of ___ ¼, Meridian: H ( ) M ( ) S ( ) Source of Coordinates (GPS, topo, map & type): _____
T___ R___ Sec___, ___¼ of ___ ¼, Meridian: H ( ) M ( ) S ( ) GPS Make & Model: Mobile phone-based GPS
DATUM: NAD27 ( ) NAD83 ( ) WGS84 (●) Horizontal Accuracy: _____ meters/feet
Coordinate System: UTM Zone 10 ( ) UTM Zone 11 ( ) *OR* Geographic (Latitude & Longitude) (●)
Coordinates: Latitude: 34.796646°
Longitude: -118.637298°

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):*

One adult observed foraging from a barbed wire fence immediately north of the California Aqueduct.

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: Grassland, fiddleneck fields, and rubber rabbitbrush scrub, limited development, inc. canal
Visible disturbances: None
Threats: Habitat loss due to proposed water project
Comments:

Determination: *(check one or more, and fill in blanks)*
[ ] Keyed (cite reference): _____
[ ] 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 E: Archeological Phase 1 Report

ARCHAEOLOGICAL PHASE I
FOR THE
HIGH DESERT WATER BANK PROJECT
LOS ANGELES COUNTY, CALIFORNIA

Prepared for:

Antelope Valley - East Kern Water Agency

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USGS Quadrangle: La Liebre Ranch 7.5' USGS topographic maps

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LIST OF ACRONYMS

°C	degrees Celsius
°F	degrees Fahrenheit
AMSL	above mean sea level
Agency	Antelope Valley - East Kern Water Agency
ARMR	Archaeological Resource Management Reports
B.P.	years before present
CEQA	California Environmental Quality Act
cm	centimeter(s)
CRHR	California Register of Historical Resources
CRMMP	Cultural Resources Monitoring and Mitigation Plan
DPR	Department of Parks and Recreation
EBA	East Branch of the California Aqueduct
GIS	geographic information systems
GPS	global positioning system
LADWP	Los Angeles Department of Water and Power
LAPL	Los Angeles Public Library
LAWC	Los Angeles Water Company
m	meter(s)
MCA	Medieval Climatic Anomaly
MDM	Mount Diablo Meridian
mm	millimeter(s)
NAHC	Native American Heritage Commission
NRHP	National Register of Historic Places
PD	Provenience Designation
PRC	Public Resources Code
SCCIC	South Central Coastal Information Center
SLF	Sacred Lands File
SSJVIC	Southern San Joaquin Valley Information Center
SWP	State Water Project
USGS	United States Geological Survey
WPLT	Western Pluvial Lakes Tradition

EXECUTIVE SUMMARY

AECOM was retained by the Antelope Valley - East Kern Water Agency (Agency) to conduct a Phase I cultural resources assessment for the High Desert Water Bank Project (Project). The Agency is the lead agency for the Project. The undertaking is an action under the California Environmental Quality Act (CEQA) with the purpose of identifying potential impacts to cultural resources, in compliance with CEQA, Public Resources Code (PRC) Section 21000 et seq. and the State CEQA Guidelines, California Code of Regulations Section 15000 et seq.

The area of possible impacts (Project Area) is approximately 1,500 acres bounded by Avenue A to the north (Kern / Los Angeles County line), 300th Street West to the west, 280th Street West to the east, and the California Aqueduct to the south. Also, the Project Area encompasses Sections 1, 2, 11, and 12 of Township 8 North, Range 17 West of the La Liebre Ranch United States Geological Survey 7.5-minute quadrangle (U.S. Department of Interior Geological Survey 2017).

The Agency proposes to build and operate a groundwater recharge and recovery program referenced as the High Desert Water Bank to store State Water Project (SWP) water conveyed to the area via the California Aqueduct. The proposed storage and retrieval methods allow the Agency to store water during wet years when SWP allocations exceed demand to make up for dry conditions in subsequent years when SWP allocations are small or disrupted.

To comply with listed regulations and guidelines, AECOM conducted a Phase I cultural resources assessment consisting of archival research, a Native American contact program, and a field survey to identify and mitigate impacts to cultural resources within the Project Area. The following individuals completed these tasks as representatives of AECOM. Danielle Flowers conducted a records search on February 15, 2017, at the South Central Coastal Information Center, housed at California State University, Fullerton. Information center employees conducted a second records search on March 6, 2017, at the Southern San Joaquin Valley Information Center, housed at California State University, Bakersfield. This is known as the Study Area throughout the report. The Study Area encompassed a 0.5-mile radius around the Project Area and was researched to ascertain cultural resources investigations and previously recorded cultural resources. The records search revealed that seven cultural resources investigations were previously conducted encompassing approximately half of the Project Area. Three previously recorded cultural resources were identified within the Study Area. One of these (P-19-004154) was identified within the Project Area.

A Native American contact program was implemented by AECOM as part of the cultural resources assessment for the Project. This program consisted of first contacting the Native American Heritage Commission (NAHC) to request a Sacred Lands File check and list of relevant Native American groups or individuals that might potentially have additional information or concerns relevant to the Project Area. An informational letter, response form, and map were sent to five Native American representatives designated by the NAHC. Three responses have been received to date. Two had no comment and one indicated interest in

receiving the final report. None of the responses indicated that the Project Area exhibited sensitivity for cultural resources.

Antelope Valley – East Kern Water Agency and AECOM sought to identify impacts to tribal cultural resources within the project area. No prehistoric or historic sites of Native American origin which might include tribal cultural resources were identified within the Study Area during the archaeological records search at the South Central Coastal Information Center and Southern San Joaquin Valley Information Center.

In compliance with state law, the Antelope Valley – East Kern Water Agency has contacted interested parties about the Project. This includes contacting Native American groups concerning tribal cultural resources as part of recent changes to CEQA, defined by Assembly Bill 52 (AB 52). At the time of the commissioning of this study, two Native American body has requested formal consultation with the Antelope Valley – East Kern Water Agency on projects within its territorial boundaries. Currently, consultation between the Antelope Valley - East Kern Water Agency and Native American tribal bodies is in progress.

As part of the cultural resources field investigation, a pedestrian survey was conducted from March 20, 2017, through April 7, 2017, to identify the presence of any cultural resources in the Project Area. The field-intensive pedestrian study identified six new cultural resources within this footprint consisting of two prehistoric isolates and four historic sites.

The results of this Phase I investigation in the Project Area and previous studies within a 0.5-mile buffer established a low to moderate chance of further discovery. None of the new cultural resources discovered during this survey were recommended as eligible for the National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR). However, previous investigations suggested site P-19-004154 is eligible under criteria A and C for the NRHP and criteria 1 and 3 for the CRHR. The site has been evaluated under criteria A and C for the NRHP and 1 and 3 for the CRHR because of its association with events that have made a significant contribution to the broad patterns of California's history and cultural heritage as well as complex design required to distribute water throughout California on a large scale. The period of major significance is between 1960 and 1974, making most of its operation historic.

Because the Project is under CEQA jurisdiction, only CRHR evaluations are conducted. Therefore, for P-19-004154 the site is recommended eligible under both criteria 1 and 3 for the CRHR listing for two reasons. First, the site is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage. Second, as a requirement for criterion 3, the site is associated with complex design systems required to distribute water throughout California on a large scale. Per guidelines of the Project proponents, this site does have the potential to be affected by Project tasks. However, this does not affect its eligibility as the resource will still be a supplier of water and retain is value as a historic resource. In addition, it is important to note that avoidance of cultural resources regardless of eligibility is also recommended.

The potential to encounter archaeological and tribal cultural resources do exist, however, based on findings they are moderately low. Therefore, part-time archaeological monitoring is

recommended during initial ground-disturbing activities in undisturbed younger Quaternary deposits. A Cultural Resources Monitoring and Mitigation Plan (CRMMP) should be developed to outline monitoring protocols. The CRMMP should identify key personnel and describe coordination, monitoring, and reporting responsibilities. Monitoring should be done by, or under the direction of, an archaeologist who meets Secretary of the Interior's Standards. The archaeological monitor would have the authority to redirect construction equipment if potential archaeological resources are encountered. If archaeological resources are encountered, work near the discovery will halt until appropriate treatment or further investigation of the cultural resource is determined by a qualified archaeologist by the provisions of CEQA Guidelines Section 15064.5. If the qualified archaeologist discovers during excavations that there is a higher sensitivity for cultural remains within younger Quaternary deposits, monitoring in that area may be increased to full-time. In addition, if the qualified archaeologist discovers during excavations that there is no longer sensitivity for cultural remains, particularly due to disturbances or because excavations have extended below younger Quaternary deposits, monitoring in that area may be reduced further or eliminated.

If any Native American cultural material is encountered within the Project Area, consultation with interested Native American parties should be conducted to apprise them of any such findings and solicit any comments they may have regarding appropriate treatment and disposition of the resources. If human remains are discovered, work in the immediate vicinity of the discovery should be suspended, and the Los Angeles County Coroner contacted. The Coroner will communicate with the NAHC and identify a Most Likely Descendant under PRC Section 5097.98 and California Code of Regulations Section 15064.5 if the remains are considered Native American in origin.

CHAPTER 1
INTRODUCTION

INTRODUCTION

The Antelope Valley - East Kern Water Agency (Agency) requested AECOM to conduct a Phase I cultural resources assessment in connection with the High Desert Water Bank Project (Project). The Agency proposes to build and operate a groundwater recharge and recovery program in Los Angeles County. This program will utilize the State of California's State Water Project (SWP) facilities as the source of water for recharge operations and the point of delivery for recovery operations. As part of the SWP, California proposes to provide multiple facilities across the state to store and supply water to distributers in Northern California, the San Francisco Bay Area, San Joaquin Valley, Central Coast, and southern California with the goal of delivering it to two-thirds of state residents (California State Water Project 2017). The Agency will utilize SWP water allocations from participating State Water Contractors and other partnering agencies including the Agency's allocation implement the proposed program that will further support the State's objectives of water distribution, specifically, in the southern California region.

PROJECT DESCRIPTION AND SETTING

The Project includes the construction of a groundwater bank with 280,000 acre-feet in capacity. The total Project Area is approximately 1,500 acres, 1.6 miles north to south, and 2 miles east to west. The groundwater bank will be capable of storing 70,000 acre-feet of water per year. All of this water is conveyed via the California Aqueduct during wet years when SWP allocations exceed regular demands. Also, the Agency proposes to recover an estimated 70,000 acre-feet of stored water during dry or critical years. The purpose of the Project is to allow the Agency and its partners to rely on a groundwater bank as a primary water source during these dry or critical periods (see Figures 1 and 2).

This report is written following the California Environmental Quality Act (CEQA) guidelines, Public Resources Code (PRC) Section 21000 et seq. and California Code of Regulations Section 15000 et seq. to satisfy Phase I requirements of a cultural resources assessment. This evaluation includes archival research, Native American contacts, a field survey, and evaluation of cultural resources 45 years or older for the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR). The potential of identifying cultural resources and mitigation measures for the course of the Project and future work are provided.

PROJECT PERSONNEL

AECOM personnel involved in the cultural resources assessment are as follows:

Alec Stevenson, B.A., directed the Project field efforts, provided figure graphics, maintained geographic information systems (GIS) data, and served as the main report author. Marc Beherec,

Ph.D., R.P.A., and Christy Dolan, M.A., RPA, contributed senior review and quality assurance. Linda Kry, B.A., contributed to the historic section and historic site records; Danielle Flowers, B.A., conducted archival research; and Allison Hill, B.A., oversaw field efforts as crew chief of the cultural resources survey supported by Danielle Flowers and Brendan Fitzsimons and contributed to Native American contacts. Resumes of key personnel are included in Appendix A.

REPORT ORGANIZATION

This report is organized following the Archaeological Resource Management Reports: Recommended Contents and Format Guidelines, (Office of Historic Preservation 1990). This provides a standardized format and suggested report content, scaled to the size of the Project. Chapters of this evaluation are as follows:

- Chapter 1 is the introduction and describes the general Project settings as well as personnel.
- Chapter 2 is the Project description, including Project location, proposed undertaking, and known construction details.
- Chapter 3 is the environmental and cultural setting along with a detailed history of the Project Area. This includes a brief discussion of Project climate, hydrology, geology, and flora, as well as prehistoric and historic contexts relevant to the immediate Project and surrounding area.
- Chapter 4 discusses archival research and Native American contact program.
- Chapter 5 summarizes the field methods and results of the effort.
- Chapter 6 explains the results of the field effort.
- Chapter 7 addresses management recommendations for future and ongoing activities.
- Chapter 8 addresses tribal cultural resources management recommendations.

CHAPTER 2
PROJECT DESCRIPTION

PROJECT LOCATION AND SETTING

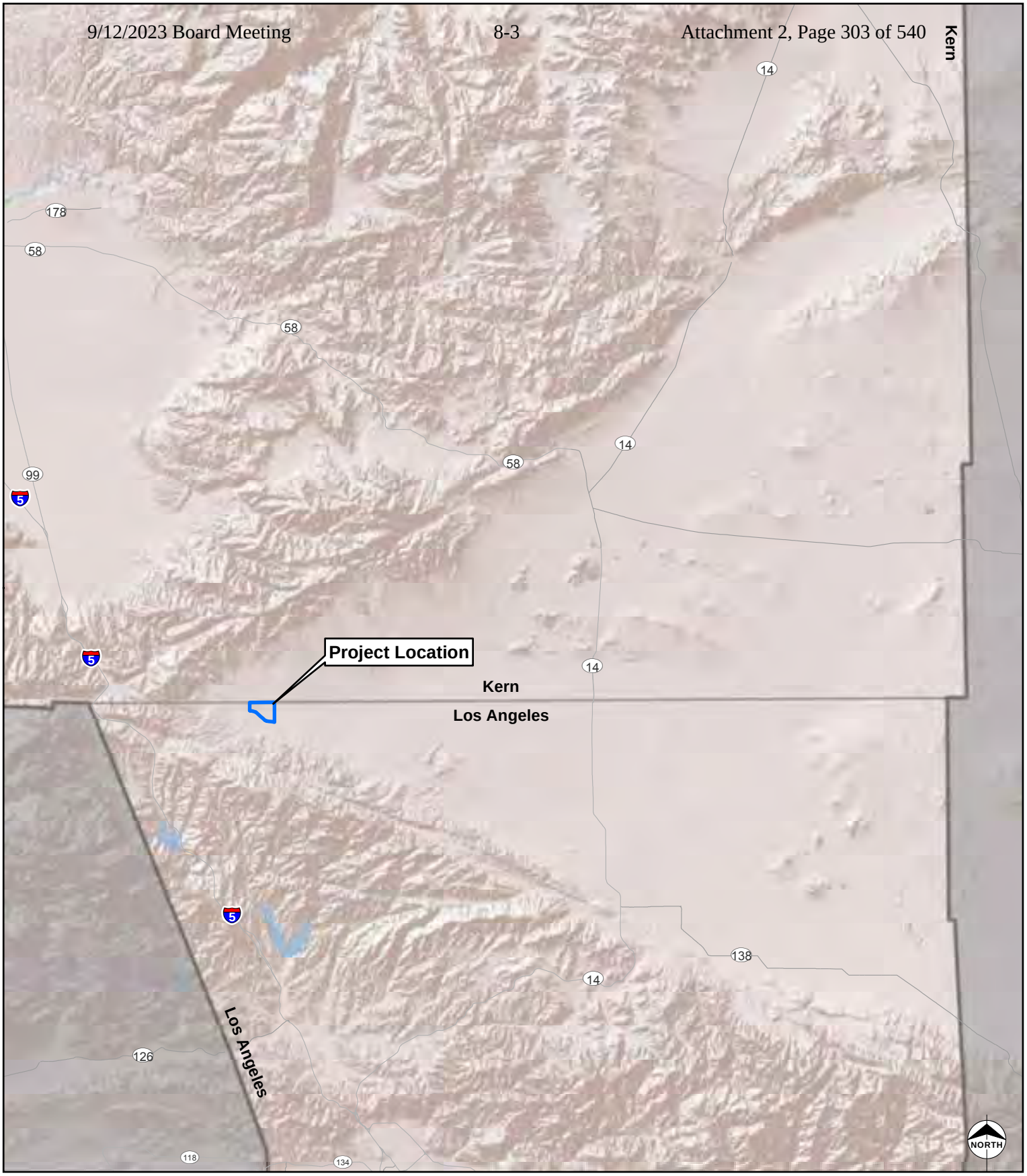
The Project Area consists of fallowed agricultural land surrounded by mountain ranges to the north, south, and west. Farmland is the major factor of the surrounding land ownership type comprising 95% of the Project Area and 65% of the Project border. The remaining 5% of land use is designated as open space associated with the aqueduct. This open space also encompasses the remaining 35% of the Project border. With the exception of some isolated residential homes within and to the east of the Project Area, the nearest residential community is 0.5 mile south and 2 miles to the east. The Project is bordered by Avenue A consisting of the Kern/Los Angeles County line, 300th Street West to the west, 280th Street West to the east, and the California Aqueduct along the southern boundary (Site P-19-004154). The Project is situated south of an existing water bank owned and operated by another Agency. The general area slopes to the east with approximately a 50-foot drop over 2 miles (Figure 1).

The Project is located on the La Liebre, California U.S. Geological Survey (U.S. Department of Interior Geological Survey) 7.5-minute topographic quadrangle, covering Sections 1, 2, 11, and 12 of Township 8 North, Range 17 West in the San Bernardino Meridian (SBM) (U.S. Department of Interior Geological Survey 2017) (Figure 2).

PROJECT DESCRIPTION

The Agency proposes the construction of a groundwater bank with 280,000 acre-feet in capacity that will store SWP water from various state water contractors and other partnering agencies throughout the State of California, including the Agency. The Project proposes to store approximately 70,000 acre-feet per year of SWP surface water conveyed via the California Aqueduct during wet weather years when SWP allocations exceed demands. The Agency then proposes to recover up to an estimated 70,000 acre-feet per year of the stored water during dry and critical weather years when SWP allocations are low or disrupted. The Project would allow the Agency and its partners to rely primarily on the groundwater bank as their primary source of water during dry weather years.

Water for recharge operations will be collected from the California Aqueduct adjacent to the Project Area and distributed to the recharge areas via a new 70-inch turnout (150 cubic feet per second capacity) off the Aqueduct. From the Aqueduct turnout, water will be conveyed to the different areas of the site with an approximate 3.5-mile combination / bidirectional recharge and recovery pipeline main ranging in size from 36-inch to 70-inch diameter. This water main will be constructed with a number of aboveground turnouts that will serve as the point of connection to approximately 8 miles of temporary aboveground piping ranging in size from 12 inches to 48 inches in diameter. This aboveground piping will be installed throughout the site to deliver recharge water to the various low earthen berm recharge basins. Given the proposed recharge operations of 70,000 acre-feet per year (year-round) and an assumed recharge infiltration rate of half a foot per day, the Agency would need to construct roughly 400 acres of recharge basins.



Legend

- Project Area
- Highway
- County Boundary

Scale1:663,241

1 inch = 55,270 feet

High Desert Water Bank Project
Antelope Valley –
East Kern Water Agency

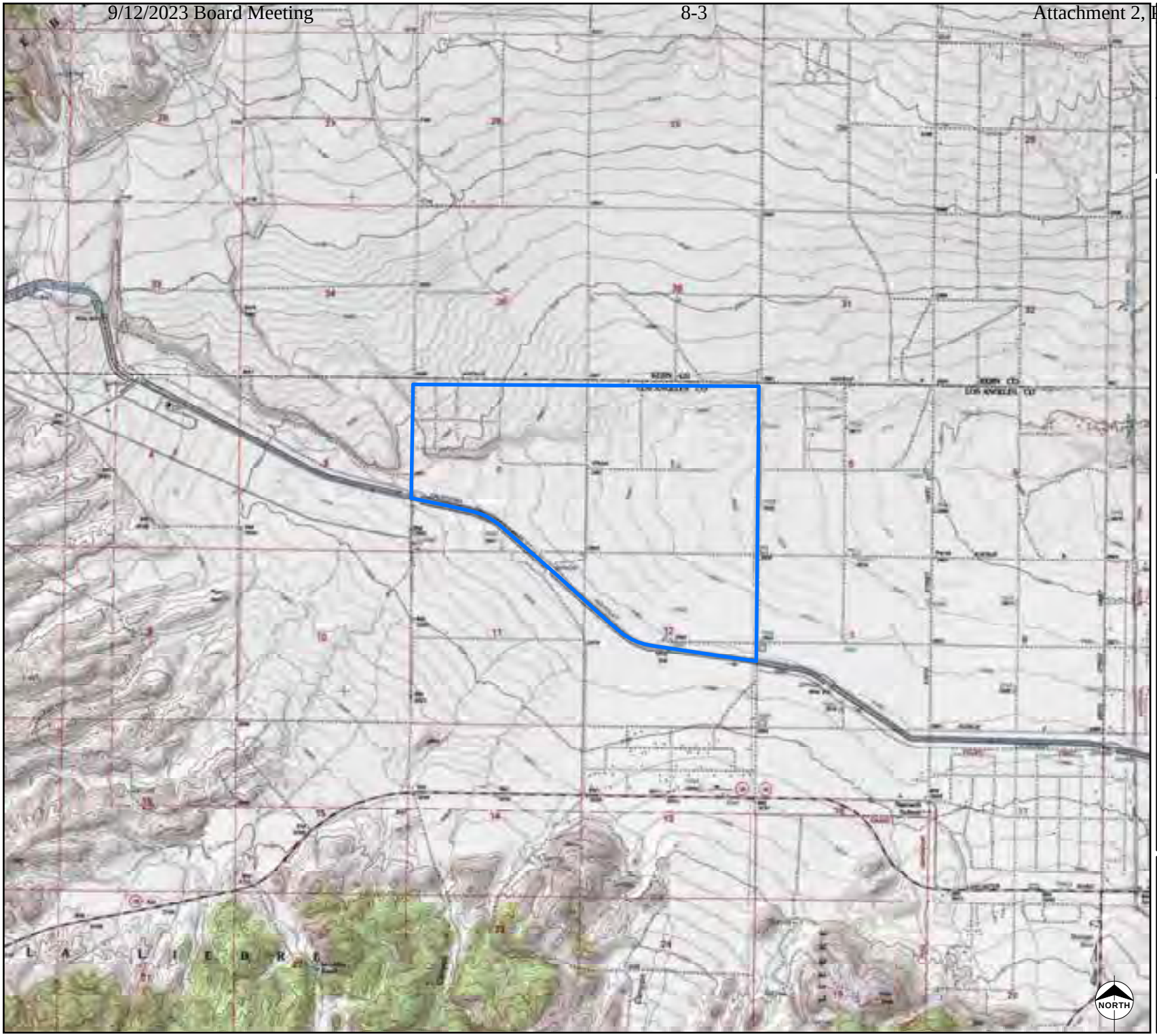
Regional Map

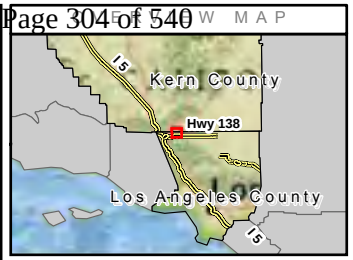
Date: 5/9/2017
Project: 60537613.0004

AECOM

Figu

Path: C:\GIS Data\Projects\60537613.0004 - AVEK Enterprise Water Bank Group\MXD\Report Maps\Figure-1_RegionalMap_20170509.mxd





Legend

Project Area

Scale 1:48,000
1 inch = 1 miles

0 0.25 0.5 1
Miles

0 0.5 1 2
Kilometers

High Desert Water Bank Project
Antelope Valley –
East Kern Water Agency

Project Location

Date: 5/9/2017
60537613.0004

AECOM

Figu 800

Given that recharge efficiencies are anticipated to decrease over time, the Agency proposes to build recharge basins on roughly 1,200 acres of the 1,500-acre site as recharge operations will be cycled throughout the site to maintain recharge efficiencies.

The recharge operations are conducted year-round in wet weather years when SWP water is available. Recharge may be accomplished using three methods. In the first method, water may be spread out over the property by flooding, similar to agricultural operations where contour flooding is used with shallow low earthen berms that are 3 feet or less. The second method includes center pivot water application facilities in which a center pivot irrigation system would be used to apply water along the surface similar to a row crop irrigation system. The third method includes the construction of engineered basins where water would be deposited for recharge varying in depth from 5 to 10 feet. Given some environmental constraints, the preferred method for recharge operations would be the flood irrigation method with low earthen berms about 3 feet in depth. The Agency proposes to conduct groundwater level monitoring with the use of five newly constructed monitoring wells and other existing wells within the Project Area. During dry weather years or any other time when the Agency's partners call for water previously stored at the Project, the Agency's recovery operations will be accomplished with the use of groundwater extraction wells that will deliver the recovered water back to the California Aqueduct.

The Agency proposes to recover 90% of the banked water at a rate of 70,000 acre-feet per year. Assuming individual wells can produce a yield of 2,500 gallons per minute, the Agency proposes to construct approximately 18 groundwater extraction wells. Recovered water from the bank would be collected in a centralized location where a booster pump station with 100 cubic feet per second capacity and a 250,000-gallon storage tank would be built to return the banked water to the California Aqueduct. This water will be collected via approximately 6 miles of well collection pipelines ranging in diameter size from 12 inches to 48 inches in conjunction with a combination bidirectional water main.

Please note that these facilities and their locations are preliminary in nature and are subject to change after final design. Cultural evaluations will be performed to cover worst-case conditions as the general Project Area will completely encompass the possible iterations of specific facility locations (Figure 3).

PROJECT AREA

Typically, the Project Area for archaeological resources is defined by a proposed project's three-dimensional ground disturbance area(s), while the Project Area for built resources also includes adjacent areas that may be indirectly affected (Office of Historic Preservation 1990).

The Project Area is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by that undertaking. The Project Area was established in conjunction with the Agency. It is located within portions of Sections 1, 2, 11, and 12; Township 8 North, Range 17 West (MDM) of the La Liebre Ranch 7.5-minute USGS topographic map (Figure 2). This encompasses all likely locations for the proposed Project. Any deviation outside the Project Area boundary will require additional cultural resource evaluation under CEQA Guidelines, California Code of Regulations Section 15000 et seq., and PRC Section 21000 et seq.

Legend

Project Area

Scale 1:18,000
1 inch = 1,500 feet

0 500 1,000 2,000
Feet

0 125 250 500
Meters

High Desert Water Bank Project
Antelope Valley –
East Kern Water Agency

Project Area

Date: 5/9/2017
60537613.0004

AECOM

Fig 802

CHAPTER 3
PROJECT SETTING

INTRODUCTION

The Project is located in the far west part of the Mojave Desert within Los Angeles County 24 miles southwest of Tehachapi and 27 miles west of Lancaster at the foothills of where the Tehachapi Mountain and San Gabriel mountain ranges meet. This region is also known as the Antelope Valley (U.S. Department of Interior Geological Survey 1981). The Project Area is bounded by the California Aqueduct to the south and the Los Angeles / Kern County border to the north. The Project Area is mostly flat with approximate ranges of elevation between 2,950 and 3,000 feet above mean sea level (AMSL). It has a slight downward slope of 0.5 degrees to the east.

GEOLOGY AND PHYSIOGRAPHY

The Mojave Desert in the Mojave physiographic province is mostly Quaternary sediments and mixed tertiary quaternary, Mesozoic granite, and older sedimentary deposits. The Project in the western Mojave Desert is devoid of most of this geologic variation with a vast majority of Quaternary sediment (The National Geologic Map Database 2017).

The Sierra Nevada, and in turn the Tehachapi Mountains, is a massive uplift of granitic batholith (Bateman 1978), while the Transverse ranges including Mount Pinos to the west, and Liebre/San Gabriel Mountains to the south are part of a Basement complex, a geologic feature possibly caused by convergence of the San Andres Fault bordering the San Gabriel Mountains and the Garlock fault marking the southern edge of the Sierras. The convergence of these faults and associated mountains are complex and specifically formed the dynamic processes of the western Mojave. Karl S. Kellogg proposed in 2004 that the shearing faults and uplift produced blocked regions that quickly lead to spreading mountain range influence and flanking landslides (Dibblee 1967).

HYDROLOGY

Evidence of paleo-environmental change around the Project Area has been well documented in the diverse regions of the Great Basin and Mojave Desert (Anderson 1990; Anderson et al. 1985; Mehringer 1986). Through these studies, a general picture of environmental change has emerged for the last 10,000 years.

California as a whole was cooler and moister than it is today with glaciers in the Great Basin stretching all the way into the Mojave desert creating vast arrays of pluvial lakes (Antevs 1995; Anderson 1990; Anderson et al. 1985; Mehringer 1986).

The Great Basin is characterized by a series of north-south–trending ranges and associated valleys. The various elevations on such a landscape affect the temperature and perception of an area. The Mojave Desert, bordering the Great Basin and location of the Project Area, has its climate signature, specifically in the west where multiple mountain ranges meet. The Mojave encompasses both hot and cold desert environments and ecosystems leading to comparatively wet conditions in the east and dry conditions to the west. Annual precipitation in the east ranges from 50 millimeters (mm) up to 750 mm with often unpredictable weather patterns. Temperature here can range between 14 degrees Fahrenheit (°F) in the winter and up to 104 degrees Fahrenheit in the summer (Davey et al. 2007).

The Project, located in the Western Mojave region, exists in these drier and hotter conditions where precipitation is based on larger Pacific Ocean winter storms that can overcome its western surrounding mountain ranges. Here precipitation is less than 5 mm per year with annual ranges of 59.2 to 62.6 degrees Fahrenheit, winter temperatures of 37.58 to 42.8 degrees Fahrenheit, and summer temperatures of 102.4 to 107.6 degrees Fahrenheit (Davey et al. 2007).

CLIMATE

Climatic History

The geology of the region created the structure of the Mojave Desert as a whole. Erosional processes resulted in sediment accumulation, creek channels, and Pleistocene Lake formations. The variables have been studied in detail to identify paleo climatic and paleo environmental trends during the late Pleistocene and Holocene of east-southern California. Regional overviews have been conducted by Wells et al. (2003), Mehringer (1977), Bettinger (1982), Elston (1982), Hall (1983), and Grayson (1993).

Researchers have drawn upon geological and biological research to construct a model of how climate has changed and how those environmental pressures have affected the distribution of biological resources in east-central California. A model presented by Reheis, Bright, Lund, Skipp, and Fleck (2012) was developed for the Mojave region using Lake Manix as a baseline. Also, Simons (2002) completed studies in the Black Rock region to the north. Both Simons (2002) and Reheis et al. (2012) are drawn upon for this report. It is important to note that Wells et al. (2003) point out the variability of the Mojave climate and lake formation where variability in climactic conditions demonstrated in 1916, 1938, 1969, and 1978 are as variable as earlier stages in the Late Pleistocene and Early Holocene. It is, therefore, difficult to establish a baseline with certainty (Wells et al. 2003).

Late Pleistocene: ca. 15,000 to 10,000 B.P.
At this time, the area was between 10 and 4 degrees cooler (°C) than it is today. Cooler deglaciation of the Sierra Nevada and the White Mountains began approximately 15,000 years before present (B.P.) with most areas ice free by 12,000 B.P. Around 13,000 B.P. to 11,000 B.P., the climate became much dryer. During this time, Lake Mojave Basin is seasonal and mostly dry. Lowland juniper woodlands were replaced by desert shrub communities, consisting mainly of sagebrush. After 11,000 B.P., the lake levels were relatively low even during the rainy season,

and climate became much warmer and drier. This led to well-established desert shrub environments more typical of the Holocene in this region.

Early Holocene: ca. 10,000 to 8,000 B.P.
By the time total drying of Lake Mojave occurred, modern plant communities expanded into new areas; this is indicated by the transition from Late Glacial juniper woodlands to Holocene steppe and scrub communities. The pinyon pine zone moved north and upslope as a result of improved climactic conditions. Modern fauna indicative of the Mojave were established during the Early Holocene.

Middle Holocene: ca. 8000 to 3000 B.P.
During the early Middle Holocene, the climate warmed and became drier. In the late Middle Holocene, there was a short wet period marking a new growth of Lake Mojave and its surrounding basins. However, the region was still hot leading to a pinyon-juniper woodland retreat upslope, overlapping with the sub-alpine conifers. Creosote bush began to occupy the northern portions of its current range, and a variety of shrubs began to occupy the lower elevations of the basins.

Late Holocene: 3,000 to Present Day
Cooling temperatures and an increase in moisture were accompanied by a series of volcanic eruptions along the Mono Lake, Mono Craters, and Inyo Crater's axis between 2,000 and 200 years ago. The Neoglacial Period (ca. 3600–1500 B.P.) is identified by an increase in precipitation and generally lower temperatures, resulting in higher lake stands. This is followed by the Medieval Climatic Anomaly (MCA), which occurred between 1200 to 600 B.P. and is typically defined as an arid period with warmer temperatures, resulting in lower stream flow and lower lake stands. The MCA is followed by the Little Ice Age (ca. 600–100 B.P.), a period of cooler temperatures and increased precipitation; resulting in increased stream flow and higher lake stands.

Modern Climate

The Project is located southwest of the southern boundary of the Great Basin situated between the Tehachapi Mountain and the San Gabriel mountain ranges within the western region of the Mojave Desert. This is a floristic region, which includes sage and shade scale brush communities at lower elevations and piñon juniper woodlands in the uplands (Grayson 1993).

The Mojave Desert is situated between the Great Basin to the north and Sonoran desert to the south. It is a large basin with a western apex located mostly between 34 and 38 degrees north latitude with elevations ranging between 11,000 feet AMSL and 282 feet below mean sea level (Mojave Desert 2017). These differences in elevation are caused by alternating mountain peaks between localized adjacent basins. The western Mohave Desert is characterized by sharply delineated mountains with interior drainages bounded by the San Andreas fault to the southwest and the Garlock fault to the northwest (Dibblee 1967). Slopes in the region are mostly composed of metamorphic rock. The most common substrate is Precambrian gneisses and granite (Mojave Desert 2017).

FLORA AND FAUNA

Flora

The high peak of the Tehachapi Mountain to the north and the San Gabriel mountain range to the south create a barrier against westerly precipitation, resulting in a rain shadow for the Mojave Desert Block. This variance in the rain ultimately affects the temperature thereby affecting the biotic communities. Vegetation in this desert block consists of scattered sagebrush variances. Grass and flowering plants grow annually in the spring for brief periods of time. Most of the vegetation is uniform due to the little influence the local geology and soil has on plant communities (Dibblee 1967).

The Mojave Desert consists of vast quantities of intermittent streams that contain the same vegetation communities described above. Perennial or year-round streams are much rarer and contain mostly cottonwood and willow trees. Joshua trees are also common on alluvial slopes at higher altitudes between 3,000 and 4,000 feet. Mountain slopes at higher altitudes consist of mostly scrub oak, chamiso, manzanita, juniper, pinon pine, and yucca. Above 6,000 feet, forests start to take hold with mostly oak, pine, and cedar (Dibblee 1967).

The Project Area elevation ranges of 2,950 to 3,000 feet AMSL produce a vegetation community of various scrubs, including rubber rabbit brush (*Ericameria nausea)* and herbaceous weeds such as fiddlenecks (*Amsinkia* sp.), with phacelia (*Phacelia* sp.), goldfields (*Lasthenia* sp.), and other nonnative grasses.

Fauna

Large fauna species are rare in the Mojave Desert. Rodents, reptiles, and birds are more common and are found on the desert floor. Rodent species include various pocket mice (*Perognathus* spp.), whitetail antelope squirrel (*Ammospermophilus lectures*), and kangaroo rats (*Dipodomys* spp.). Reptile species present include the desert tortoise (*Xerobates agassizii*), desert iguana (*Dipsosaurus dorsalis*), common king snake (*Lampropeltis getulus*), and the Mojave rattlesnake (*Crotalus scutulatus*). More than 300 species of birds are found in the Mojave Desert. A few species more common to the open desert are the prairie falcon (*Falco Mexicans*), burrowing owl (*Athene cunicularia*), roadrunner (*Geococcyx californianus*), and horned lark (*Eremophilia alpestris*). Other species found in the Mojave include the blacktail jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), and coyote (*Canis latrans*).

CULTURAL SETTING

Prehistory

Prehistoric human settlement patterns in the Mojave Desert have been influenced by these environmental changes including settlement patterns and resource exploitation. Archaeological investigations have indicated that, although the area had limited prehistoric resource and surface water, the region supported a long and occasionally dense human population (Moseley and Smith

1962). Archaeological remains tend to be widely scattered and sparse, and are usually located along the margins of pluvial lakes (Warren 1990). Although research in the Mojave has produced a wide array of cultural sequences, for the purpose of this report, a broad terminology is used to provide temporal context to the region. The sequence consists of the Paleoindian period, Pinto period, Gypsum period, Rose Spring, and Protohistoric period.

Paleoindian Period (12,000 to 7000 years B.P.)

This period is the earliest documented evidence of human occupation in the Mojave Desert and has been referred to as the Western Pluvial Lakes Tradition (WPLT) (Sutton 1991). The WPLT encompasses a broad geographic region from the western Great Basin to southern California and north to Oregon. Evidence suggests that Paleoindian period population groups were highly mobile, with settlement patterns that reflect a dependency upon lacustrine resources (Sutton 1991; Sutton et al. 2007; Warren 1990). This cultural adaptation to pluvial conditions (e.g., lakes, marshes, and grasslands) flourished for several millennia around 10,500 B.P. but then disappeared during the warmer and more arid conditions of the Middle Holocene (Moratto 1984).

The Lake Mojave complex is one of the most recognized lithic complexes of the WPLT. These assemblages are typically characterized by foliated points and knives, Lake Mojave points, Silver Lake points, and flaked stone crescents. Materials dating to the Paleoindian period in the western Mojave Desert are few and confined to the dry lake beds in Antelope Valley. To date, none have been identified in Antelope Valley (Sutton 1991).

Pinto Period (7000 to 4000 B.P.)

A period of dramatic environmental change has been posited for the Pinto period. The environment changed from pluvial to arid conditions; rivers and lakes dried up and animal and plant life changed. This period is seen by Warren (1984) as marking the beginnings of cultural adaptations to the desert. People either adapted to this change or relocated to areas with more favorable environmental conditions. This depopulation of the area seems evident in the small size of Pinto period sites, which are often limited to surface deposits. These ephemeral sites suggest temporary or seasonal occupations by small groups of people (Moratto 1984), focusing on a forager-like strategy (Sutton et al. 2007).

The most important distinction of Pinto period assemblages relates to an increase in the abundance of groundstone implements (Sutton et al. 2007). The appearance of significant numbers of milling stones in Pinto assemblages is attributed to the exploitation of hard seeds, which is seen by Warren (1984) as part of the process of subsistence diversification brought on by the increased aridity and decreasing game populations. No confirmed Pinto period sites are known in Antelope Valley although a few Pinto-style projectile points have been identified in the Tehachapi area and other parts of the western Mojave (Sutton 1988).

Gypsum Period (4000 to 1500 B.P.)

The Gypsum period is marked by an increase in the number of archaeological components, and increased diversity in assemblage and site setting. Occupations in the Antelope Valley during this period are indicative of large permanent or seasonally occupied villages, with smaller, seasonally based, special purpose sites including rock rings, lithic scatters, and milling stations

(Sutton 1980; Warren 1986). The appearance of a large village and special purpose sites in the Antelope Valley has been attributed by Warren (1986) to refined hunting methods and seed processing technologies that raised the regional carrying capacity and facilitated population growth.

Gypsum period assemblage sites are characterized by diagnostic projectile points, leaf-shaped points, rectangular-based knives, flake scrapers, T-shaped drills, large scraper-planes, choppers, and hammerstones. There is an increase in the presence of milling stones, and the mortar and pestle were introduced during this period.

Rose Spring Period (ca. 1500 to 1000 B.P.)

Archaeological evidence for the Rose Spring period indicates a major population increase, changes in artifact assemblages, and well- developed middens (Sutton 1988). The introduction of small projectile points into assemblages in the Mojave Desert and the Great Basin appear to mark the introduction of the bow and arrow and decline of the atlatl and spear weaponry (Sutton 1996).

Subsistence strategies seem to shift toward the exploitation of small to medium-sized game, including lagomorphs and rodents. The milling of plant foods was an important activity with numerous bedrock milling features at Rose Spring, including mortars and slicks (Sutton 1988).

Protohistoric Period (1000 B.P. to the time of European contact)

There is an increase in the ethnic and linguistic complexity within the Mojave Desert during this period. Desert Side-notched points and Brownware ceramics become more widely distributed throughout the Mojave Desert and the Great Basin. This development, combined with linguistic evidence, is associated with the Numic-speaking Paiute and Shoshone expansion throughout most of the area (Bettinger and Baumhoff 1982).

Characteristic artifacts of this period include Desert series projectile points (Desert Side-notched and Cottonwood Triangular), Brownware ceramics, Lower Colorado Buff Ware, unshaped hand stones and milling stones, incised stones, mortars, pestles, and shell beads (Warren and Crabtree 1986).

Ethnohistory

Ethnographic history suggests that the Project Area lies within Tataviam territory. However, Serrano territory is only 1 mile to the northeast and Kitanemuk not far to the southwest. The territories of three tribes converge in the Project Area. The location was very diverse, regionally and home to the Serrano, Kitanemuk, and Tataviam. In fact, the notion of distinct cultural boundaries was foreign to these cultures with overlapping groups being customary during this period (Zigmond 1986). Interaction and intertribal relations were peaceful and cooperative, with combined annual hunting expeditions for game drives being commonplace (Voegelin 1938). The floor of the Antelope Valley was used seasonally by the Kitanemuk, and much more extensively by the Tataviam and Serrano.

Serrano, Kitanemuk, Tataviam

The Serrano is a generic term that literally translates to the word "mountaineers." This is not how the Serrano viewed themselves. The Kitanemuk are also viewed as being Serrano or "mountaineers". There is some merit as the customs of both the Serrano and Kitanemuk are very similar, suggesting similar origins. The merging of various groups and the Kitanemuk into what is known as the Serrano today was a product of Spanish conquest where the last remaining Shoshonean groups and various scattered subgroups reemerged and formed a new unit within the Great Basin.

The dialect of the Tataviam and Serrano is very similar lending credence and originality to Shoshonean roots. Kitanemuk, however, has some differences. Differences in dialect are quite distinct, being much more similar to Ute-Chemehuevi root language groups that also formed the Kawaiisu dialect (Sutton 1991).

Just like in their language, the Serrano have similarities with the Kitanemuk that are not shared by the Tataviam. Both the Serrano and Kitanemuk live in communal tule houses while the Tataviam were separated into larger seasonal regions. In the tule houses village communities are often separated into bands that represent different microregions of this otherwise larger group (Kroeber 2014).

Regardless of their differences, the three groups share many important traits. Subsistence patterns are an example of this. Here the Serrano, Kitanemuk, and Tataviam are all similar. Subsistence focused on hunting and gathering of local plant and animal resources (Zigmond 1986). The principal food source was acorns, which were supplemented with meat from large and small game, rodents, birds, and insects (Moratto 1984; Kroeber 2014). Acorns were further used to trade for exotic obsidian and salt. Although no agriculture was practiced, there is evidence of the pruning of tobacco plants and the burning of wild seed fields to improve plant yields for the following year (Zigmond 1986). These groups exploited many other plants and Zigmond (1986) identified over 250 taxa that were used.

HISTORIC SETTING

Research to develop a framework for discussing the types of archaeological resources that have been encountered during the Project was conducted using various sources that included the previous archaeological investigations and/or evaluations, the Los Angeles Public Library (LAPL), Los Angeles Department of Water and Power (LADWP) archives, and various web-based resources. The following section summarizes current understanding of water-related historic developments in Los Angeles and southern California. This is followed by a more focused discussion of the Project Area.

Water Development in Southern California

Water—too much, or too little—has shaped much of California's history. Rain falls unevenly and seasonally over the length of the state, and all too often California faces prolonged drought or flood cycles. The state has a generally Mediterranean climate, with little rainfall through the

summer months. Although the amount of available water varies enormously from northern redwood regions of heavy rainfall to dry southern deserts, California as a whole is considered semiarid. Much of the state relies on winter snow in the mountains to provide spring and summer runoff to water the valleys below.

The effects of the erratic water distribution are magnified by the eccentric placement of population centers. Traditionally, cities and towns are developed from agricultural beginnings located adjacent to water sources. California, however, developed abruptly during the Gold Rush. Instead of following a gradual growth pattern along waterways based on traditional practices of agriculture, California became suddenly urban, with cities preceding farms.

During the Gold Rush and the years that followed, California rarely let planning for long-term water needs interfere with current enterprises, and many decisions were made without regard for an adequate supply of water. People set up businesses in locations that suited them in other ways. Cities were built along the coast, where shipping and commercial advantages outweighed the shortages of municipal water supplies; extracted gold from dry diggings using water carried in miles of mining ditches; planted crops requiring irrigation in fertile, but arid valleys; and brought in the water to make desert housing developments bloom, at least until the lots were sold.

As a result of growing population and the increasing diversion of water, the once plentiful water supply provided by the Los Angeles River began to dwindle. A number of waterworks projects were underway during the second half of the 19th century in an effort to increase water flow and water retention. When these measures proved insufficient, a more permanent solution to Los Angeles' water shortage was sought. By the mid-19th century, city officials established a system of water use, including fees and rules, to govern the *Zanjas*, an irrigation system that would carry water from the Los Angeles River for domestic and agricultural use.

In 1868, the Los Angeles Water Company (LAWC), a private company, leased the city's water system (Nilsson 2011). In 1878, Frederick Eaton, the superintendent of the LAWC, hired 23-year-old William Mulholland as a *Zanjero*, a ditch-digger for the *Zanja* irrigation system, under the newly formed LAWC (Nilsson 2011; Water and Power Associates 2017). Mulholland's hard work paid off in 1886 when, at the age of 31, he was promoted to superintendent for the LAWC, succeeding Eaton (Nilsson 2011). Mulholland's new role within the LAWC consisted of overseeing various water conveyance features. During the early stages of his career, Mulholland implemented the use of the city's first water meter. However, the city's water supply still could not meet the demands of the city's population growth and it was clear that the Los Angeles River would not be a sufficient means of water supply for the City of Los Angeles (Nilsson 2011).

In 1898, the LAWC's 30-year lease of the city's water system expired. The years that followed the expiration of the lease revolved around the ownership of the city's water supply. It was also during this year that Eaton, Mulholland's predecessor, became the Mayor of Los Angeles. During his term as Mayor, Eaton created the Los Angeles Water Department and appointed Mulholland as the superintendent and Chief Engineer (Water and Power Associates 2017). Ultimately, in 1901, a bond was passed permitting the City of Los Angeles to purchase the water

system and removing the control from the LAWC (Nilsson 2011; Water and Power Associates 2017).

During the ensuing years, Mulholland became critical of the city's growth and the Los Angeles River's ability to sustain it. In fact, Eaton had questioned Los Angeles's water sustainability years prior to Mulholland and had spent 13 years researching alternatives to the city's water source.

Financed by Mulholland, both Eaton and Mulholland returned to this new water source. Together, Mulholland and Eaton surveyed and evaluated the Owens Valley (Plate 1). According to an article in the Los Angeles Times, Mulholland was quoted as saying that, "[Eaton] has made it possible for us to accomplish the greatest scheme of water development ever attempted in this country (Water and Power Associates 2017)."

Plate 1. William Mulholland Surveying (waterandpower.org)

In 1905, Mulholland designed an aqueduct that would bring water from the Owens River to the north end of the Owens Valley. The construction of the 233-mile-long Los Angeles Aqueduct began in 1908 and required the labor of 5,000 men for the duration of 5 years. The project was completed in 1913 and, on November 5 of that year, 40,000 people assembled to watch the water pour down the aqueduct into the San Fernando Reservoir (Van Norman Reservoir) (Plate 2). The sudden availability of water found a rapid shift of land use to gardens, vineyards, and orchards (Gumprecht 1999). From 1900 to 1920, Los Angeles had grown from a town of 100,000 people to a booming city of nearly 600,000.

Plate 2. Citizens Witness Owens River Water Reach Los Angeles November 5, 1913 (LAPL, LADWP Photo Archive)

According to an article in the Los Angeles Times (Los Angeles Times 1924), Mulholland assured the people of Los Angeles that they would have ample water supply, enough for two million people, through its Owens-River Aqueduct (Los Angeles Aqueduct). The people of Los Angeles, according to Mulholland, "may well count themselves as being extremely well favored (Los Angeles Times 1924)." The construction of the Los Angeles Aqueduct was backed by the people of Los Angeles at a cost of over $24 million and was one of the most significant engineering achievements in Los Angeles history (Los Angeles Times 1927).

History of the Project Area

At a statewide level, investigations into the availability of water sources led to the development of the SWP. The SWP was met with opposition from northern California residents who were skeptical of sharing their water supply with the residents in southern regions. At the same time, southern California water agencies such as the Metropolitan Water District of Southern California were wary of whether their northern counterparts would hold onto their part of the bargain. And so, between the years of 1957 and 1959, a special committee formed to draft a compromise that would satisfy everyone's needs. The compromise that was the determining factor in whether the state water project would take place was the Burns-Porter Act, which ensured contracts for legitimate water supplies that could not be affected by future legislation, capital that would be sufficient in delivering the water supply to southern California, and funds set aside to construct only necessary facilities as specified in the act. Construction for the SWP began in 1957 (Department of Water Resources 2017).

The California Aqueduct was developed as a means to transfer water from northern California to southern California as part of the SWP (Plate 3). Construction of the California Aqueduct began in 1963 and, when completed, measured 444-miles long. The SWP saw the construction of numerous other facilities, including the East Branch of the California Aqueduct (EBA), which is a 98-mile-long aqueduct that was constructed between 1966 and 1973 and is a segment of the California Aqueduct. The northern terminus of the EBA is situated south of Palmdale and the southern terminus is located in western San Bernardino at Lake Perris. The EBA consists of canals, siphons, tunnels, penstocks, a power plant, and a pumping plant and has undergone modifications since its conception to increase water capacity flow to southern California. The EBA has been evaluated for the NRHP under Criterion G.

Land grants in the Project Area were purchased from the Bureau of Land Management between 1890 and 1900 depending on the sections of land purchased. The purpose of these purchases varied. Most were either Sales-Cash entry 3 stat. 566 or homestead purchases. The majority of these lands were most likely used for ranching purposes as associated with the size of land purchased (Bureau of Land Management 2017)

Other than water-based use for this general area to provide drinking and agricultural water for southern communities, this particular location appears to have been in use as farmland in the past 60 years. This is shown in USGS maps that record the changes in landscape over time. Although limited in scale, it is shown that agriculture likely started in this region sometime between 1949 and 1965. Multiple water containment structures encountered during the survey and used for irrigation did not exist in 1949 USGS maps, but do exist in the 1965 La Liebre USGS topographic map (U.S. Department of Interior Geological Survey 1949 and U.S. Department of Interior Geological Survey 1965).

Plate 3. California Aqueduct October 31, 1968 (LAPL, LADWP Photo Archive)

CHAPTER 4
ARCHIVAL RESEARCH AND CONTACT PROGRAM

INTRODUCTION

As part of this cultural resources assessment, an archival research program and Native American contact program were conducted. The purpose of these programs is to identify known cultural resources in the Project Area, provide context for the evaluation of cultural resources within this area that are 45 years or older, and to inform interpretations regarding the potential to encounter previously unidentified cultural resources in the course of ground-disturbing work associated with the Project.

Archival research included a records search at the South Central Coastal Information Center (SCCIC) and Southern San Joaquin Valley Information Center (SSJVIC), a review of local cultural resource registers, and review of local and regional historic maps. Supplemental research was also conducted to provide prehistoric and historic contexts for Project Area use, including a review of county building records and known local prehistoric archaeological sites. The Native American contact program sought to provide interested Native American representatives with information about the Project and to solicit comments and concerns about potential impacts to cultural resources in the Project Area.

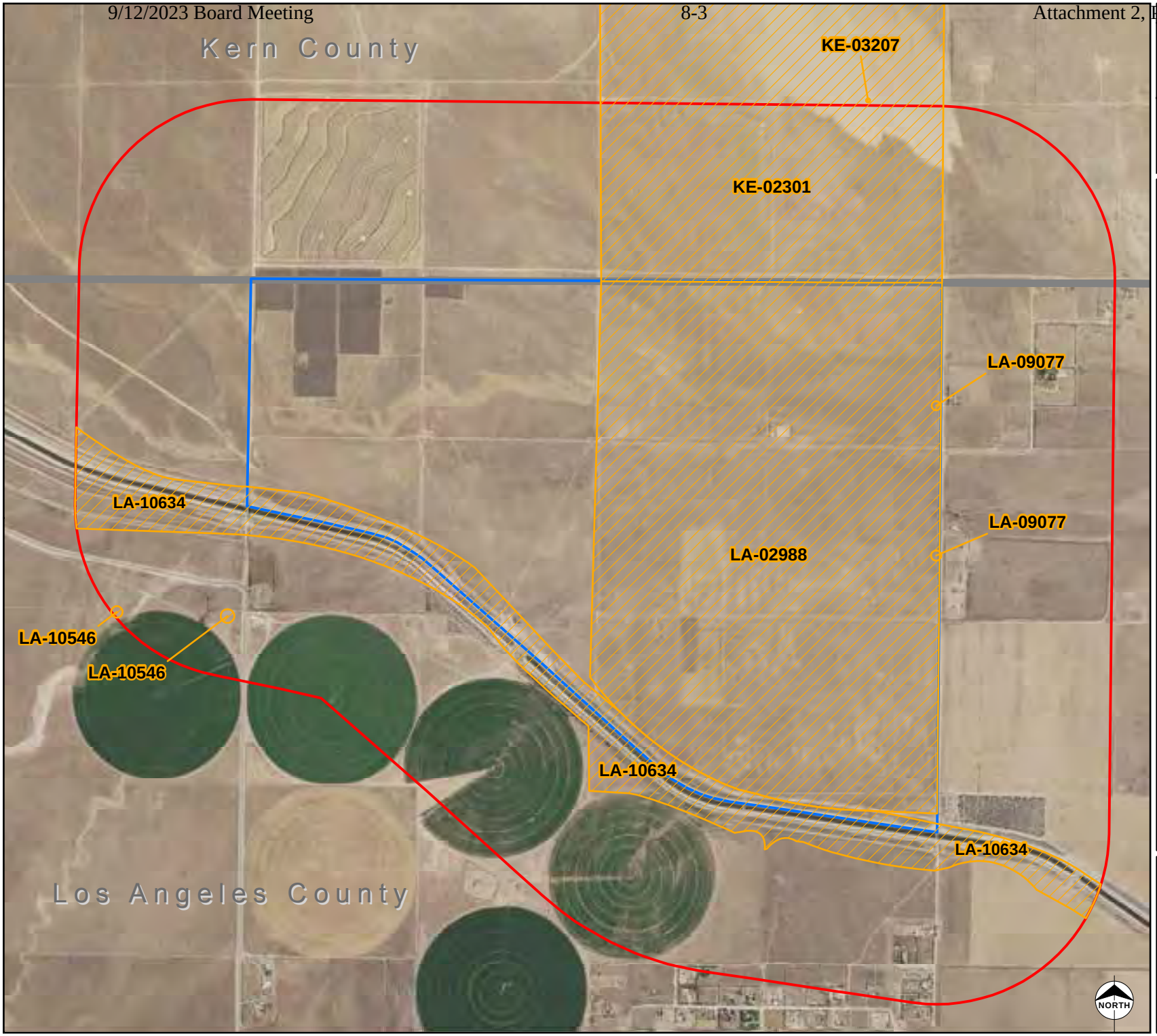
ARCHIVAL RESEARCH

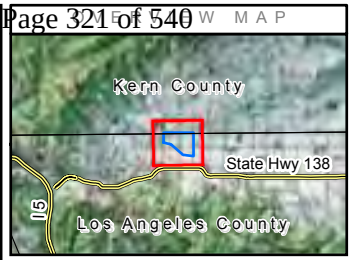
An archival records search for the Project Area was conducted by Danielle Flowers on February 15, 2017, at the SCCIC and California State University of Bakersfield staff on March 7, 2017, at the SSJVIC. Previously conducted cultural resources investigations and previously identified cultural resources were reviewed as part of this investigation (Figure 4). A 0.5-mile radius around the Project Area was examined and is referenced as the Study Area in this document. Both the SCCIC and SSJVIC visitations were required because the Study Area encompasses both Los Angeles and Kern Counties. The Project Area, however, falls only within Los Angeles County.

Information was obtained from the SCCIC and SSJVIC, local historical resource inventories, and listings for the California Office of Historic Preservation's Historic Resources Inventory, which includes resources in the NRHP database, the CRHR, and California State Points of Historical Interest. USGS modern and historical topographic were also reviewed.

PREVIOUS CULTURAL RESOURCES INVESTIGATION REPORTS

A records search conducted at the SSJVIC and SCCIC included a review of archaeological, historical, and environmental literature in addition to the site records and survey maps on file at the SSJVIC and SCCIC. The records search at the SCCIC and SSJVIC revealed a total of seven cultural resources investigations previously conducted within a 0.5-mile radius of the Project





Legend

- Previous Cultural Projects
- Project Area
- Study Area
- County Boundary

Scale 1:24,000
1 inch = 2,000 feet

0 500 1,000 2,000
Feet

0 125 250 500
Meters

High Desert Water Bank Project
Antelope Valley –
East Kern Water Agency

Previous Investigations Conducted within the Study Area

Date: 5/9/2017
60537613.0004

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Fig 817

Area (Table 1). These reports were all cultural resource surveys ranging from small to large in size. Most were related to specific development Projects. Four of these are pole replacement Projects (KE-03207, LA-10455, LA-10546, and LA-09077) while one is large with a 100-mile linear swath related to the California Aqueduct (LA-10634). The remaining two (KE-02301 and LA-02988) are medium to large parcel surveys. KE-02301 covers almost 1,000 acres of land while LA-02988 covers just under 650 acres. In addition to this, approximately 50% of the Project Area and 20% of the Study Area have been previously surveyed (Table 1).

Table 1. Previous Investigations Conducted within the Study Area (0.5-mile buffer)

Author	Report (LA-)	Description	Date
Robinson, R. W.	LA-02988	A Cultural Resources Investigation of Approximately Nine Hundred and Forty Acres Located in the Western End of Antelope Valley, Los Angeles County, California	1994
Schmidt, James J.	LA-09077	DWO 6036-4800; A.I. No. 5-4843: Tejon 12 kV Distribution Line Deteriorated Pole Replacement Project, Antelope Valley Area, Los Angeles County	2005
Orfila, Rebecca	LA-10455	Archaeological Survey for the Southern California Edison Company: Replacement of One Deteriorated Power Pole on the Tejon 12 kV Circuits in Los Angeles County, California (WO 6036-4800 F4814)	2009
Schmidt, James J.	LA-10546	DWO 6036-4800; J.I. No. J-4852: Tejon 12kV Distribution Line 2006 Deteriorated Pole Replacement Project, Antelope Valley Area, Los Angeles County	2005
Bray, Madeleine	LA-10634	Preliminary Archaeological Survey Report for 98 Linear Miles of the East Branch Extension of the California Aqueduct for the DWR East Branch Enlargement Project, Los Angeles and San Bernardino Counties	2010
Schiffman, Robert	KE-02301	Archaeological Investigation for Parcel Map No. 10450, Kern County, CA	1998
Schmidt, June	KE-03207	Re: DWO 6036-4800; A.I. No. 5-4868: Tejon 12 kV and Petan 12 kV Distribution Lines 2005 SAM Project, Antelope Valley District, Kern and Los Angeles Counties	2006

Previously Recorded Cultural Resource Sites and Isolates

The SCCIC records search identified three previously recorded cultural resources within the Study Area (Table 2). The SSJVIC identified none. Of these three previously recorded cultural resources, two are isolate glass fragments (P-19-101240 and P-19-101241) and the third is the EBA (P-19-004154).

Table 2. Previously Recorded Cultural Resource Sites within the Study Area (0.5-mile buffer)

Primary Number (P-19-)	Site Type	Time Period	Type	Eligibility	Location in Study Area
004154	East Branch of the California Aqueduct.	Historic	Site	Recommended as eligible under Criteria A and C for NRHP / 1 and 3 for CRHR	In Project Area
101240	Two aqua non-diagnostic glass fragments.	Historic	Isolate	Not eligible for either NRHP or CRHR.	Not in Project Area
101241	One sun-colored amethyst glass vessel fragment.	Historic	Isolate	Not eligible for either NRHP or CRHR.	Not in Project Area

P-19-004154 / East Branch of the California Aqueduct

The EBA is a historic aqueduct still in use as part of the SWP. It was constructed between 1966 and 1973 spanning 98 miles of the total 444 miles, delivering water from northern California to southern California. The northern section begins just below Tehachapi where the main California Aqueduct splits in an east to west direction. The EBA runs east at this split along the border of the San Gabriel Mountains.

In total, the EBA consists of a series of canals, check structures, bridges, culverts, siphons, and power plant facilities to power non-gravitational movement. The canal is a trapezoid between 12 and 16 feet that is broken into multiple locational zones. Along the canal are 24 check structures, 15 siphons, 37 bridges, 107 culverts, 83 over chutes, the Alamo Power Plant at the northern end of the EBA, and Pearblossom Pumping Plant near Highway 138 northwest of the community of Pearblossom.

The California Aqueduct itself is registered as eligible in the NRHP; however, the EBA is not. It has been recommended as eligible in the site record under Criterion 1 as it is argued to be associated with events that have made significant contributions to national and California history.

P-19-101240 / SR-027-I

Isolate P-19-101240 consists of two aqua glass fragments that contain minute gas seed that is likely from the same container. The glass fragments have no diagnostic markers or features. This resource is not eligible for inclusion in the CRHR or the NRHP.

P-19-101241 / SR-028-I

Isolate P-19-101240 is one solarized amethyst glass vessel fragment. This fragment is the lip and mount of the vessel. Other than these features, there are no diagnostic markers on this isolate. This resource is not eligible for inclusion in the CRHR or the NRHP.

Other Archival Research

In addition to the Information Center records search, historical maps, photos, drawings, and newspapers were consulted to identify any potential cultural resources and to compile information pertinent to the significance of any identified resources.

Historical Maps Database

Historical maps on file at the AIC, the Los Angeles County Historic Land Records, Sanborn Fire Insurance Maps, and USGS databases were reviewed. The SCCIC, SSJVIC, Los Angeles County Historic Land Records, and Sanborn Fire Insurance Maps revealed negative results with no historic information on parcels within the Project Area. USGS records, on the other hand, were useful but limited due to scale (U.S. Department of Interior Geological Survey 1903, USGS Neenach 1943, USGS Neenach 1949, USGS Neenach 1955, USGS Western United States 1959, and USGS La Liebre 1965).

The USGS maintains a database of modern and historical topographic maps that are accessible to the public on the USGS website. Several historical maps of the Project Area were reviewed to identify any historical information of land use or structures that may not currently be visible within the Project Area but were present in the past. Maps reviewed for the Project include the 1903 Tejon 1:25000 scale 100-foot contour interval quadrangle; 1943 Neenach 15-minute quadrangle; 1949, 1955, and 1959 Western United States Los Angeles 1:250,000 scale USGS map; and a 1965 La Liebre Ranch 7.5-minute quadrangle (Table 3) (U.S. Department of Interior Geological Survey 1903, U.S. Department of Interior Geological Survey 1943, U.S. Department of Interior Geological Survey 1949, U.S. Department of Interior Geological Survey 1955, U.S. Department of Interior Geological Survey 1959, and U.S. Department of Interior Geological Survey 1965).

Some nonresidential structures are visible in 1906 built along dirt roads. The Project Area contains six structures in all. By 1943, they are gone, most likely demolished. In 1949, the Antelope Aqueduct Station was mapped but is directly east and outside of the Project Area. The most detailed historic USGS quadrant map is the La Liebre 1965 map, which establishes that the western portion of the Project was used for wheat farming with two possible water storage berms associated with agriculture (U.S. Department of Interior Geological Survey 1965).

Table 3. Historic Maps Reviewed

Map Name	Scale	Date
USGS Tejon Quadrangle	1:125000	1903
USGS Neenach Quadrangle	1:62500	1943
USGS Los Angeles Western United States	1:250000	1949
USGS Los Angeles Western United States	1:250000	1955
USGS Los Angeles	1:250000	1959
USGS La Liebre Ranch	1:24000	1965
USGS Los Angeles Western United States	1:250000	1966
USGS Los Angeles	1:250000	1975

NATIVE AMERICAN CONTACT PROGRAM

As part of this investigation, AECOM conducted a Native American contact program on behalf of the Antelope Valley - East Kern Water Agency, to inform interested parties of the proposed Project and to address any concerns regarding Traditional Cultural Properties or other resources that might be affected by the Project as required by the CEQA Guidelines Section 1 and 15064.5, PRC Section 21000 et seq., and the California Code of Regulations Section 15000 et seq. The program involved contacting Native American representatives provided by the NAHC to solicit comments and concerns regarding the Project.

A letter was emailed to the NAHC on February 24, 2017, and a follow-up email with an addendum was sent on March 2, 2017 with a hard copy mailed on March 16, 2017. These letters requested that a Sacred Lands File (SLF) search be conducted for the proposed Project and that contact information be provided for Native American groups or individuals who may have concerns about cultural resources within the Project. The purpose of this request was to identify the presence of any known tribal cultural resources in the CEQA Project Area. The NAHC responded to the request in a letter dated March 3, 2017. The NAHC indicated that an SLF search had been conducted with negative results with no tribal cultural resources identified but noted that the lack of specific site information in the SLF is not an indication that Native American cultural resources are absent from the Project Area. The letter also provided the names of Native American groups and individuals who may have an interest in the Project and knowledge of cultural resources within the Project Area. This procedure is an informative process not directly tied to AB 52 consultation. AB 52 consultation and management is discussed in Chapter 8.

Letters were mailed on March 16, 2017, to groups and individuals provided by the NAHC, informing them of the Project and requesting information and concerns they may have about cultural resources in the area. Maps depicting the Project Area and response forms were attached to each letter.

Confidential Appendix B provides additional details on the concerns and directions provided to archaeologists on behalf of concerns or request for additional information by individuals or groups.

SUMMARY

In summary, archival research indicates that approximately 20% of the Study Area has been previously studied. Within the Study Area the approximately 50% of the Project Area was previously studied. However, no prior cultural resources were identified within the Project Area. This investigation identified three previously recorded significant cultural resources that are considered historical resources under CEQA within the Project Area.

REQUIRED PERMITS

The Project is located on private land owned by the Agency; no required permits are necessary.

CHAPTER 5
SURVEY METHODS AND RESULTS

SURVEY METHODS

The purpose of the Project was to conduct a Phase I intensive pedestrian survey to determine the location of unknown cultural resources. Additionally, the Phase I required an update of any known cultural resources ascertained through archival research. The largest and most recent survey in the Project boundary (LA-02988) was completed in 1994 and covers approximately 50% of the eastern portion of the Project. Because the western portion of the Project is closer to the mountains and less disturbed, it is more likely to have prehistoric or historic cultural resources still intact.

Therefore, an intensive pedestrian survey was required. The survey consisted of north to south transects whenever possible and did not exceed 15-m intervals per crew member. As AECOM employees, Allison Hill, Danielle Flowers, and Brendan Fitzsimons conducted the survey. When an artifact or feature was identified, the survey would be halted. Then the area would be examined up to 30 m from the cultural find. If more artifacts or features were found within 30 m then another 30 m was surveyed from that point. For the purposes of the survey, three or more artifacts or one feature constituted an archaeological site while one or two archaeological artifacts constituted an isolate. When an archaeological site or isolate was identified, its location was recorded using a sub meter accurate handheld global positioning system (GPS) device (Trimble GEO XH 6,000), photographs were taken, the appropriate field forms were completed, and detailed descriptions and notes were compiled.

The structure of the notes, office database, and field GPS collection methods revolved around the Provenience Designation (PD) system. It operates specifically to make field work integrate with GPS Trimble GeoXh 6000 and EDRI Arc GIS databases. All isolates or sites are recorded into the PD Log. This includes PD number, isolate or feature type, material, coordinates in Universal Transverse Mercator North American Datum (UTM NAD 83), depth, date, initials of recorder, a brief description, and detailed measurements if it is an isolate or simple boundary measurements if it is a site. The purpose of the PD Log is to note preliminary information about the isolate or site that complements the Trimble data for revisit and recordation after the survey is complete.

Cultural resources determined to be isolates are recorded immediately in the PD Log and into designated field forms. If the resource is identified as an archaeological site, the PD Log is filled out but the site is not recorded until it can be revisited at a later date. Once complete, the crew records the sites using required forms to collect the information for California Department of Parks and Recreation (DPR) forms. This technique gives the crew a better understanding of in field context before recording occurs.

The survey was conducted from March 21, 2017 to April 02, 2017; the weather was sunny with temperatures ranging between 45 degrees Fahrenheit (°F) and 85°F. Ground visibility varied tremendously depending on vegetation and leaf litter. Visibility ranged between 95% and 5% and

was much lower in the southern half. On March 22, 2017, hail and some rain with thunderstorms occurred.

Sites identified during the surveys were documented in detail to allow for the completion of all appropriate DPR 523 forms. Minimally, these include primary forms (Form 523A) and location maps overlaid on a USGS topographic map (Form 523J). More complex resources potentially require an Archaeological Site Record (Form 523C), Linear Feature Form (Form 523E), and/or a Sketch Map (Form 523K). Sketch maps included a site datum, features, artifacts concentrations, and other cultural elements. Isolated finds were noted and their location mapped with a hand-held GPS. In addition to the information required for DPR site forms, detailed field notes were produced for each site. Field notes described site impacts, geology, and vegetation, and contained diagnostic information about cultural materials at each site.

The DPR site forms are presented in Appendix C (confidential appendix) of this report. All updated DPR site forms will be sent to the California Historical Resources Information System for inclusion in the state inventory system. The survey conducted within the Project Area identified two archaeological isolates (PD-1 and PD-2) as well as four archaeological sites (PD-3, PD-4, PD-5, and PD-6). PD-7 is the EBA section of the California Aqueduct and was updated as much as possible given land access restrictions. Each resource is described in Chapter 6.

CHAPTER 6
ARCHAEOLOGICAL RESULTS

The survey conducted within the Project Area identified two isolates, four newly identified archaeological sites, and one previously recorded site. Each site was given a temporary designation and is described below.

Temporary Designation: PD-1
PD 1 is an isolated possibly silicified sandstone tertiary flake. It has a simple dorsal surface with a prepared platform. The flake measures 3 centimeters (cm) x 2 cm x 0.8 cm and is white-brown in color.

Temporary Designation: PD-2
PD 2 is an isolated chert tertiary flake. It has a simple dorsal surface with a prepared platform. The flake measures 2.5 cm x 3 cm x 0.4 cm and is white-tan in color.

Temporary Designation: PD-3
Site PD 3 consists of a water catch basin compound composed of eight associated features: Feature 1 – a water catchment basin; Feature 2 – a concrete pad; Feature 3 – another concrete pad; Feature 4 – a third concrete pad; Feature 5 – four cinder block wall segments; Feature 6 – a concrete pipe pile; Feature 7 – a water valve; and Feature 8 – a concrete anchor block. Feature 5 makes up the northern boundary, Feature 7 marks the southern boundary, Feature 1 delineates the eastern boundary, and Feature 8 is the western boundary. Feature 5 appears to mark the entrance into the facility for water irrigation distribution. The concrete pads that make up Features 2, 3, and 4 are located east of the entrance. Feature 2 is the second largest of the three concrete pads and is rectangular in shape with the presence of threaded-mounting bolts around its perimeter and cut conduits along its western and southern sides. This pad is likely for an office trailer as there is a telephone box situated along the south side with a ramp along the north side and a step located on the south end. Feature 3 is the largest of the concrete pads with two mounting bolts and brackets attached along the south end. Features 2 and 3 are located at the east base of the water catchment (Feature 1). Feature 4 is the smallest of the concrete pads and is constructed in four segments that vary in length and is stacked six courses high. The top course consists of decorative cinder blocks. Feature 6 is located at the northeast end of Feature 1 water catchment and consists of a large pile of concrete pipe present among various debris such wood and sparse scatter of glass fragments. Feature 7 is southwest of Feature 1 and consists of a water valve that is in line with two aboveground vertical pipes embedded in a concrete pad. Feature 8 is a concrete anchor block. See Plate 4 for an overview of the site. The site measures 369 feet north-south by 407 feet east-west and is less than 1 mile northwest of the California Aqueduct. The compound appeared to have been purposely destroyed and abandoned but it is unclear when this took place. It is possible that the site once served as a maintenance facility associated with the SWP.

Review of historic aerials and topographic maps show that the water catchment basin (Feature 1) was present as early 1971. In addition, the maps show that the area surrounding the site has been utilized as agricultural land dating back to at least 1952 with the notation “Wheat” on the 1967 topographic map. It is unclear whether the other seven features recorded within Site PD-3 date to the same period.

Plate 4. PD-3 Overview of Concrete Blocks, Pads, and Block Wall

Temporary Designation: PD-4

Site PD 4 consists of three features: Feature 1 – water catchment; Feature 2 – refuse scatter; and Feature 3 – unlined earthen water drainage ditch. Feature 1 consists of a water catchment basin that measures 200 feet east-west by 164 feet north-south and approximately 4 feet in height at the northern end, with a depth of approximately 6 feet. Feature 2 consists of a historic refuse deposit in a pit measuring 5 by 5 feet. The refuse consists of 23 food and liquid cans that vary in size with rotary and 2-hole punch openings; one green glazed ceramic tableware that may be fragments of a cup; one amber-colored and five clear-colored glass bottle body fragment; and one truck or trailer siding part. These consumer and household-related resources exhibit 20th century attributes. Feature 3 consists of an unlined earthen water ditch that measures 213 feet in length by 63 inches wide and is approximately 13 inches deep. The water ditch channels water from up the slope into the Feature 1 water catchment basin. At the north end of the feature, the ditch merges with a north-south–trending irrigation ditch just west of the road. Based on the features present, it is likely that the site is associated with agricultural use and/or a refuse dump site.

Detailed descriptions of PD-4 features are as follows:

Feature 1 consists of a water catchment basin that measures 200 feet east-west by 164 feet north-south and approximately 4 feet in height at the northern end, with a depth of approximately 6 feet. The feature is located at the southern end of a slight rise that faces south. The southern end of the feature appears to have been excavated and the soil was used to create the berms along the eastern and southern sides of the feature. At the northern and western sides, two additional curved berms are present and appear to serve as a means to capture water that enters from the earthen ditch or water channel. There is an opening at the southern end of the upper berms that

allows water to flow into the southern catchment area. The western and northern walls of the feature appear to be natural topography and the interior of the southern and eastern walls appear artificially constructed. Visible disturbances to the feature consist of motorized dirt bike and quad tracks that have created depressions within the feature (Plate 5).

Plate 5. Overview of PD-4 Feature 1 Catchment Basin

Feature 2 consists of a historic refuse deposit in a pit measuring 5 feet by 5 feet. The refuse consists of 23 food and liquid cans that vary in size with rotary and 2-hole punch openings; one green glazed ceramic tableware that may be fragments of a cup; one amber-colored and five clear-colored glass bottle body fragment; and one truck or trailer siding part. None of these consumer and household related resources exhibited datable attributes (Plate 6).

Feature 3 consists of an unlined earthen water ditch that measures 213 feet in length by 63 inches wide and is approximately 13 inches deep. The water ditch channels water from up the slope into Feature 1 water catchment basin. At the north end of the feature, the ditch merges with a north-south–trending irrigation ditch just west of the road (Plate 7).

Review of historic USGS topographic maps (U.S. Department of Interior Geological Survey 1949 and U.S. Department of Interior Geological Survey 1965) resulted in the possible identification of Site PD-4. Here there are possible structures that appear on USGS maps between 1949 and 1965 labeled as Wheat. Also known is that the land on which the site is situated was utilized for agricultural purposes and/or kept undeveloped as early as 1943. As such, it's likely possible that Site PD-4 is associated with agricultural activities and/or used as a dump site.

Plate 6. Close-up of PD-4 Feature 2 Refuse Deposit

Plate 7. PD-3 Overview of PD-4 Concrete Blocks, Pads, and Block Wall

Temporary Designation: PD-5

Site PD 5 consists of a triangular-shaped water storage feature, which is visible on aerial photographs as early as 1952. The feature measures 90 feet northwest-southeast by 49 feet northeast-southwest. A portion of the northeast edge was excavated and the soil is built up in the center of the eastern edge. The northeastern berm is less defined due to disturbance. On the northeastern interior edge of the berm, approximately 9 feet, is a water well vent. In addition, refuse and debris were scattered around a tree located 9 feet north of the feature composed of steel pipe, concrete, brick, modern glass bottles, sofa springs, a recliner chair, and shotgun shells (Plate 8).

Plate 8. Overview of PD-5 Tree and Water Catchment Basin

Temporary Designation: PD-6

Site PD 6 consists of small household and automotive refuse scatter that includes one clear drinking glass fragment, one Pyrex food container, one automotive windshield piece, clear mason jar fragments, and fragments of stoneware ceramic fragments. The artifacts date to the 20th century, but otherwise none have diagnostic attributes. Review of aerial and topographic maps do not show any developments where the site is situated. It is likely that the refuse scatter is a result of roadside dumping activities as there is a roughly northwest-southeast–trending road that loosely parallels the aqueduct just south of the site (Plate 9).

Plate 9. Overview of Glass Scatter at PD-6

P-19-004154 (Temporary Designation: PD-7)

PD-7 was initially recorded by ESA in 2009 and designated as site P-19-004154. The resource consists of a segment of the EBA that was constructed between 1966 and 1973. The portion of the resource encountered consisted of two bridges for vehicular access, one siphon and one spillway. Due to restricted access to the resource, the recordation of the resource was limited to photographic documentation. The EBA was evaluated by ESA as part of that 2009 documentation, for its historical significance under the NRHP and CRHR criteria as a water conveyance system in California. According to that evaluation, the EBA appears eligible for both the NRHP and the CRHR under Criterion 1/A for its association and contribution to the development of water systems in the state of California. In addition, it appears eligible for both the NRHP and the CRHR under Criterion 3/C for its engineering design (Plate 10 and 11).

Plate 10. Overview of PD-7 (EBA)

Plate 11. Overview of PD-7 (EBA)

SUMMARY OF RESULTS

The inventory and field survey investigations identified four new archaeological sites within the current Project Area. In addition, two isolates were recorded. None of the isolated finds are considered eligible for the CRHR. Based on surface observations and documentation, none of the four sites are eligible for the CRHR and do not meet CEQA criteria for uniqueness. All of these sites are small archaeological resources that do not have significant associations and lack significant data potential. P-19-004154 (PD-7), however, is the EBA section of the California Aqueduct. The California Aqueduct is considered eligible under Criterion A and C for the NRHP as well as 1 and 3 for the CRHR. However, the EBA section is not currently evaluated as eligible. It is recommended that this EBA section should be eligible due to its association with major water systems in California and the historic impact it has had to Los Angeles and southern California as a whole.

In summary; two prehistoric isolates and four historic resources were newly discovered while one historic resource was updated. The two prehistoric isolates are non-diagnostic flakes. The four historic resources, however, fall into a few different categories; two are structural remains most likely associated with agriculture; the third is a water management structure also possibly associated with agriculture because of its built time frame, and the fourth is a refuse scatter with non-diagnostic trash debris. The relocated site is currently the eastern bypass of the California Aqueduct as it passes through the Project Area.

CHAPTER 7
EVALUATIONS AND RECOMMENDATIONS

SUMMARY

Archival research and a cultural resources survey identified seven cultural resources within the Project Area. Of these, one is the previously recorded resource EBA (P-190004154). The following discussion evaluates these resources for eligibility for listing in the NRHP and CRHR, and provides management recommendations for these resources and potential unanticipated discoveries.

The survey resulted in the identification of one previously recorded resource (P-190004145), five newly recorded resources (PD-3, PD-4, PD-5, and PD-6), and two isolated artifacts not associated with the sites (PD 1 and PD-2).

REGULATORY SETTING

Cultural resources in California are protected by a number of federal, state, and local regulations, statutes, and ordinances. Cultural resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, and/or scientific importance. State and federal laws use different terms for cultural resources. California state law discusses significant cultural resources as “historical resources,” whereas federal law uses the terms “historic properties” and “historic resources.” In all instances where the term “resource” or “resources” is used, it is intended to convey the sense of both state and federal law.

California Register of Historical Resources

The CRHR was created to identify resources deemed worthy of preservation on a state level. The CRHR consists of properties that are listed automatically as well as those that must be nominated through an application and public hearing process.

To be eligible for listing in the CRHR, a property must be at least 50 years of age and possess significance at the local, state, or national level, under one or more of the following four criteria:

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States; or
2. It is associated with the lives of persons important to local, California, or national history; or
3. It embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values; or
4. It has yielded, or has the potential to yield, information important in the prehistory or history of the local area, California, or the nation.

In addition to meeting one or more of the above criteria, historic resources eligible for listing in the CRHR must retain enough of their historic character or appearance to be able to convey the reasons for their significance. Such integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association.

EVALUATION

CEQA directs lead agencies to first determine whether a cultural resource is a "historically significant" cultural resource. The current evaluation program assessed sites that might be affected by the Project. As such only site P-19-004154 is recommended eligible under NRHP/CRHR criteria A/1 due to its associations with major water systems in California and the historic impact it has had to Los Angeles and southern California as a whole.

Evaluations for newly recorded sites are as follows:

Temporary Designation PD-1
Isolate PD-1 is an isolated sandstone tertiary flake with no practical or temporal diagnostic characteristics. It does not, nor does it have the potential to, yield information important for the prehistory of the area, California, or the nation. It is recommended as not eligible for listing. Accordingly, it does not meet any of the criteria for the CRHR.

Temporary Designation PD-2
Isolate PD-1 is an isolated sandstone tertiary flake with no practical or temporal diagnostic characteristics. It does not, nor does it have the potential to, yield information important for the prehistory of the area, California, or the nation. Accordingly, it does not meet any of the criteria for the CRHR. Therefore, it is recommended as not eligible for listing under CRHR criteria.

Temporary Designation PD-3
Site PD 3 consists of a water catch basin compound composed of eight associated features: Feature 1 – a water catchment basin; Feature 2 – a concrete pad; Feature 3 – another concrete pad; Feature 4 – a third concrete pad; Feature 5 – four cinder block wall segments; Feature 6 – a concrete pipe pile; Feature 7 – a water valve; and Feature 8 – a concrete anchor block. Regardless of similarity, the site is located too far from the California Aqueduct to have been directly associated. It is most likely related to agriculture. The site is not associated with individuals or events that directly add to the important narrative of California or national history nor does it embody distinct characteristic of form. Additionally, PD-3 does not have any distinctive historical association and does not contain important information. Accordingly, it does not meet any of the criteria for the CRHR and is recommended as not eligible for listing.

Temporary Designation PD-4
This site consists of mostly a water catchment basin with a few historical associated features. The features at PD-4 do not directly add to the important narrative of California or national history nor does it embody distinct characteristic of form. Accordingly, it does not meet any of the criteria for the CRHR and is recommended as not eligible for listing.

Temporary Designation PD-5
Although this feature is visible on USGS maps starting in 1952, the water catchment feature is not diagnostic enough to warrant eligibility as being important enough to add to our knowledge in history of this time period. PD-5 does not directly add to the important narrative of California or national history nor does it embody distinct characteristic of form Accordingly, it does not meet any of the criteria for the CRHR and is recommended as not eligible for listing.

Temporary Designation PD-6
This refuse scatter does have some artifacts that are potentially diagnostic to specific regions or general eras of time in production. However, none of the artifacts have distinct makers marks associated with diagnostic historic artifacts. Regardless of this fact, the artifacts at PD-6 are not important enough to add to the literature already in place in the region to be eligible under any criteria for the CRHR. Therefore, PD-6 is recommended as not eligible for listing.

Temporary Designation PD-7
PD-7 (P-19-004154) consists of a segment of the EBA that was constructed between 1966 and 1973. The portion of the resource that was encountered here consisted of two bridges for vehicular access, one siphon and one spillway. Due to restricted access, recordation of the resource was limited to photographic documentation. The EBA was evaluated by ESA as part of that 2009 documentation, for its historical significance under the NRHP and CRHR criteria as a water conveyance system in California. According to that evaluation, the EBA appears eligible for both the NRHP and the CRHR under Criterion 1/A for its association and contribution to the development of water systems in the state of California. This is agreed upon here for the CRHR that because of the importance of water resources to the history of Los Angeles, southern California, and California as a whole, and its relation to the nation, site P-19-004154 (PD-7) is recommended eligible for listing in the CRHR under criterion 1.

ARCHAEOLOGICAL MANAGEMENT RECOMMENDATIONS

Sites and isolates PD-1 through PD-6 are not eligible for the CRHR. No further work is necessary for the recorded components of these sites.

Site P-19-004154 (PD-7) is recommended eligible under the CRHR. The proposed Project components will affect 70 inches of the EBA in multiple locations for turnout installation. However, this work does not affect site eligibility. The site still serves its purpose of being a significant reminder of history and current supplier of water for the Los Angeles area. It is still recommended that impacts are mitigated as much as possible during installation and that full time monitoring occurs during all construction activity on this site.

Based on the results of the archival research, SLF search, and pedestrian survey there is low-moderate potential that archaeological resources will be encountered during ground-disturbing activities for the Project. Resources that might be encountered are likely disturbed by agriculture operations. These may lie beneath the surface, obscured by pavement, vegetation, or development. Because the potential to encounter archaeological resources is low but still exists for the proposed Project, the construction contractor shall use archaeological and Native

American monitoring part-time as defined in the development of a monitoring mitigation plan. If the qualified archaeologist discovers during excavations that there is a higher sensitivity for cultural remains within younger Quaternary deposits, monitoring in that area may be increased to full-time. In addition, if the qualified archaeologist discovers during excavations that there is no longer sensitivity for cultural remains, particularly due to disturbances or because excavations have extended below younger Quaternary deposits, monitoring in that area may be reduced further or eliminated.

Archaeological monitoring would include inspection of soils to determine if cultural materials are present. Archaeological monitors would follow earth-moving equipment and examine excavated sediments and excavation sidewalls for evidence of archaeological resources. The archaeological monitor shall have the authority to redirect construction equipment in the event potential archaeological resources are encountered. In the event archaeological resources are encountered, work in the vicinity of the discovery shall halt until appropriate treatment of the resource is determined by a qualified archaeologist in accordance with the provisions of CEQA Section 15064.5. If human remains are discovered, work in the immediate vicinity of the discovery will be suspended and the Los Angeles County Coroner contacted. If the remains are deemed Native American in origin, the Coroner will contact the NAHC and identify a Most Likely Descendant pursuant to PRC Section 5097.98 and California Code of Regulations Section 15064.5. Work may continue on other parts of the Project while consultation and treatment are conducted.

In the laboratory, all artifacts would be identified and inventoried, and a determination of significance made. All cultural resource material would then be transferred to an approved archaeological repository accompanied by a copy of the final monitoring report and all data in hard and electronic copy. The cost of curation, maintenance, and permanent storage of archaeological materials is assessed by the repository.

A final monitoring report shall be prepared that will include, but not be limited to, a discussion of the results of the monitoring, an evaluation and analysis of the materials collected, an itemized catalog of artifacts collected, an appendix of curation agreements and other appropriate communications, and a discussion of the Project-specific monitoring plan. This report shall be filed with the SCCIC, California State Fullerton upon completion of monitoring and analysis of materials recovered (if any).

Chapter 8 TRIBAL CULTURAL RESOURCES

ASSEMBLY BILL 52

The recent addition of Assembly Bill 52 (AB 52) to CEQA legislation creates a new resource category, tribal cultural resources, and requires that a lead agency must consult with interested California Native American tribes who request formal consultation regarding impacts to tribal cultural resources. As defined by AB 52, Tribal cultural resources are either of the following:

- Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
    - (A) Included or determined to be eligible for inclusion in the California Register of Historical Resources.
    - (B) Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.
- A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

AB 52 also creates a consultation process between lead agencies and California Native American tribes in order to identify and protect tribal cultural resources. In accordance with AB 52, Native American groups who wish to be consulted on projects within their traditional geographic area are required to request in writing that lead agencies notify them of upcoming projects within their geographic areas. The results of consultation are confidential. Consultation with interested Native American groups is being managed by the Antelope Valley - East Kern Water Agency, and documents pertaining to this consultation are included as confidential Appendix D. Mitigation measures designed to protect tribal cultural resources were created in accordance with this consultation.

At the time of the commissioning of this study the Antelope Valley - East Kern Water Agency has initiated consultation with two tribal groups. Currently, consultation between the Antelope Valley - East Kern Water Agency and Native American tribal bodies is in progress.

MANAGEMENT RECOMMENDATIONS

No sites or objects of Native American origin were identified during the archival research, which included a complete CHRIS search conducted by AECOM and a Sacred Lands File search conducted by the NAHC. In addition, no published or unpublished material was found which indicated the possible existence of tribal cultural resources (which may include geographic features) within the Project Area. However, tribal cultural resources may be present in the Project Area. AECOM recommends continued consultation with interested tribal bodies to identify resources it may determine, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. Ongoing

consultation between the Agency and tribal bodies will be available in the confidential Appendix D section.

The following are some current recommendations made by tribal groups during the ongoing consultation process.

1. If human remains or funerary objects are encountered during any activities associated with the project, work in the immediate vicinity (within a 100-foot buffer of the find) shall cease and the County Coroner shall be contacted pursuant to State Health and Safety Code §7050.5 and that code enforced for the duration of the project.

2. In the event that Native American cultural resources are discovered during project activities, all work in the immediate vicinity of the find (within a 60-foot buffer) shall cease and a qualified archaeologist meeting Secretary of Interior standards shall be hired to assess the find. Work on the other portions of the project outside of the buffered area may continue during this assessment period. Additionally, San Manuel Band of Mission Indians will be contacted if any such find occurs and be provided information and permitted/invited to perform a site visit when the archaeologist makes his/her assessment, so as to provide Tribal input.

3. If significant Native American historical resources, as defined by CEQA (as amended, 2015), are discovered and avoidance cannot be ensured, an SOI-qualified archaeologist shall be retained to develop an cultural resources Treatment Plan, as well as a Discovery and Monitoring Plan, the drafts of which shall be provided to San Manuel Band of Mission Indians for review and comment.

    a. All in-field investigations, assessments, and/or data recovery enacted pursuant to the finalized Treatment Plan shall be monitored by a San Manuel Band of Mission Indians Tribal Participant(s).

    b. The Lead Agency and/or applicant shall, in good faith, consult with San Manuel Band of Mission Indians on the disposition and treatment of any artifacts or other cultural materials encountered during the project.

CHAPTER 9
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APPENDIX A

RESUMES

AECOM

Alec Stevenson, B.A.

Archaeologist / GIS Specialist

Alec Stevenson, B.A. 2008 UC Santa Cruz (Anthropology) has over 8 years of experience conducting all types of archaeological fieldwork on both historic and prehistoric archaeological sites. His experience includes all phases of cultural resource survey, archaeological monitoring, and excavation. He has been in charge of field surveys and site recordation and has worked on his own in unsupervised positions. In addition to this, Mr. Stevenson has 6 years of GIS and data management experience. He started as a data collector in the field working as an archaeologist. This required extensive use Trimble GPS units as well as managing data from the field. Mr. Stevenson is currently certified through 40 Hour HAZWOPER training.

Professional History

AECOM

Cultural Site and Research Management

Chambers Group

Paleo Solutions

Pacific Legacy

Education

AA, Liberal Arts, Moorpark Community College

BA, Anthropology, University of California Santa Cruz

Additional Education

Archaeological field school at Ometepe, Ecuador

Online GIS classes through ESRI.com

40 Hour HAZWOPER training

CPR Training

First Aid Training

Time of Experience

8 years in Archaeology

and GIS

Archaeology and GIS Experience

AECOM, Inc.: Transportation Cultural Monitor (1 year - Los Angeles County)
Monitor for different sections of Los Angeles County for a transportation project. This includes both archaeological and paleontological sensitive areas. Construction activities observations include multiple trenches for utility relocation and some excavations areas deeper than 50 feet. This work started on 12-16-2013 and is ongoing.

AECOM, Inc.: SCE Utility Relocation Monitor (4 months Los Angeles County)
Monitored and performed excavations within the construction right of way (ROW) for utility relocation lines. Due to the sensitivity of the area, monitoring consisted of very careful watch of minute changes in soil while excavation was thoroughly conducted on a large portion of the sensitive portions of the ROW.

AECOM, Inc.: GIS Management (3 months - Kern and Inyo County)
Managed and mapped GIS data collected throughout Inyo and Kern County for monitoring and mitigation projects. Tasks included creating maps for report and analysis purposes, managing both collected and processed GIS data, and maintaining GPS Trimble devices for use in the field. Database work included the use of domains and Python script for more efficient collection and management purposes.

AECOM, Inc.: EIR Oil and Gas (1 year - Kern County)
Lead GIS specialist for three Oil and Gas EIR projects throughout Kern County. This included the creation of a logical and workable template in GIS, data collection, data management, and maps. The data had to be collected in multiple different regions while being tailored for specific subjects addressed in each EIR. Maps had to be created for both reports and data analysis while databases had to be managed for use by multiple disciplines and offices.

AECOM, Inc.: Transmission Project (1 year - CA / NV border)
Managed and mapped GIS data collected in the field for a monitoring project on a transmission line. This included species tracking data in GIS and creating weekly constraint maps of this data for agencies. This data was also converted to GPX and GDB format for handheld GPS devices.

AECOM, Inc.: Wind Energy Project (1 year - Eastern Kern County, CA)
Managed GIS and archaeology data for a construction monitoring project on a wind farm near the city of Tehachapi in Kern County. This included import and export of GIS and archaeology data taken from GPS units, managing and maintaining that data, making maps, and addressing cultural spatial questions for the client in order to streamline construction while maintaining site integrity. GPS data management involved managing Trimble devices and post-processing collected data using Arcpad and GPS Correct.

AECOM, Inc.: EIR Oil and Gas (2 months - Santa Maria, CA)
Conducted a 2,000 acre archaeological survey in Santa Maria, California. In addition to this, managed and obtained field data, processed this data through differential correction, and organized it for proper use in the office. Trimble GEO XH 2008 series was used in conjunction with a data dictionary properly formatted to match field forms. Ongoing monitoring is also being conducted.

Chambers Group, Inc.: Cultural Resources for the Directorate of Public Works, (3 years - Fort Irwin, California).
Archaeological Technician and lead GIS Specialist for the cultural resources contract at Directorate of Public Works in the Fort Irwin National Training Center, California. This was a long term contract involving archaeological survey of 10,000 acres of land per year and additional survey on an on call basis depending on military training exercises. In the field; surveyed areas assigned by the army, monitored construction activities, and recorded any discovered cultural resource areas. In addition to this, was specifically tasked with making sure all eligible archaeological sites were being properly protected and managed. In the office; managed data obtained in the field, made map figures for all written reports, and reorganized the GIS data in a more efficient manner. In addition to this, all data collected since 1980 to present was checked for quality assurance purposes and analyzed for various statistical purposes in order to help the Army come up with better areas in which to train while avoiding impacts on cultural resource areas.

Pacific Legacy, Inc.: 3D Seismic Survey (9 months - Taft, California).
Archaeological technician on an extensive archaeological survey in Taft, California at Occidental of Elk Hills. The survey was part of a 3D seismic project involving construction and deconstruction of oil wells. Acted mainly as a field data collector during surveys and site recordation using the Trimble GEO XT 2003 Series GPS Unit and creating hand drawn maps with that data. This data had to be managed and organized efficiently using the data dictionary so that it could be prepared for proper use in the office.

Linda Kry, B.A.
Archaeologist

Education
B.A. Anthropology, University of California Los Angeles
A.A. Anthropology, Cerritos College, Norwalk, California

Publications + Technical Papers + Presentations
Ehringer, C., L. Kry, S. Dietler, and M. Strauss. 2008. After the Bones Are Gone: The Role Of Personal Effects in Identifying Unmarked Historic Burials. Poster presentation at the Society for Historical Archaeology Annual Meeting, Albuquerque, NM.

Linda Kry is an archaeologist with over ten years of experience in cultural resources management within Los Angeles County, Imperial County, Inyo County, Riverside County and the Mojave Desert. Linda has developed considerable expertise with all aspects of cultural resources investigations including managing field surveys and lab analysis. She assists in the management of cultural resources specialists who conduct various types of cultural resources compliance including phase I surveys, construction monitoring, Native American consultation, archaeological testing and treatment and prehistoric and historic resource significance evaluations.

In her current role, Linda has gained extensive experience with identification and classification of all types of historic materials including ceramics, glass bottles, metal cans, garment-related items, and coffin hardware, as well as processing artifact collections, including assessing conservation requirements and artifact reconstruction. Her work in various desert and coastal projects has broadened her experience to include the identification and recordation of prehistoric resources. In addition, Linda is proficient in historic and prehistoric record searches, general historic literature research, museum and archival research, Sanborn map research, Native American consultation, and the preparation of all related cultural resources documentation. Linda authors and co-authors technical reports and is familiar with requirements for CEQA and Section 106 compliance. Her present research interests include the historical development of Los Angeles and 19th to mid-20th century consumer practices.

Project Experience

Temple Street Widening, Los Angeles, CA
Served as an archaeological monitor during road construction and utilities relocation in downtown Los Angeles. Duties included documenting historic archaeological features, coordinating work schedules with on-site construction personnel, and maintaining detailed daily reports. Responsible for processing and sorting artifact collection.

Main Street Parking Facility and Motor Transport Division, Los Angeles, CA

Archaeological and paleontological monitor of construction site in downtown Los Angeles. Responsible for identification, recovery, and mapping of historic archaeological features, maintaining detailed daily reports, and coordinating work schedules with on-site construction foreman. Over 19 historic archaeological features dating from the 1860s to the 1920s were recovered on-site. Processed and sorted artifact collection.

Central Los Angeles High School #9, Los Angeles, CA
Duties included assessing artifact conditions and conservation needs, assisting with development and implementation of artifact cleaning procedures, assisting with artifact classification and cataloging using Excel, and reconstruction of artifacts. Over 3,000 historic-era artifacts were recovered from a 19th-century cemetery.

Alameda Street, Los Angeles, CA
Archaeological monitoring of street construction at Alameda Street in downtown Los Angeles resulted in the identification and recovery of over 300 historic-era artifacts. In addition, segments of both narrow-gauge and standard gauge rail lines, sections of brick foundations, and brick irrigation features were documented. A large section of late 19th to early 20th century brick pavement and part of the Zanja were also uncovered and documented during construction.

Lakeside Recreational Complex, Sylmar, CA
Led archaeological survey and authored report on a Phase I cultural resources evaluation of the historic-era Lakeside Debris Basin property. Tasks include a California Register eligibility assessment for the facility itself and archaeological features identified as a result of the survey, and prepared a Cultural Resources Technical Report with findings and recommendations for further work, pursuant to CEQA requirements.

First Street Trunk Line, Los Angeles CA
Conducted archaeological monitoring of utilities installation, responded to monitoring discoveries including historic-period utility pipes, and determined appropriate mitigation in the form of recordation. An archaeological monitoring report will be prepared at the conclusion of the project.

Van Norman Chloramination Station, San Fernando CA
Conducted archaeological monitoring with a Native American monitor during project construction. Co-author of archaeological monitoring report that will be prepared at the conclusion of the project.

Fire Station No. 48, Seal Beach, CA
Authored a report in connection with archaeological and Native American monitoring during project construction in support of cultural resources assessment pursuant to CEQA requirements.

Topanga Library Project, Topanga Canyon, CA
AECOM conducted archaeological monitoring during construction of the Topanga Library. Construction included the installation waterlines along the roadway outside of the main project area. Monitoring resulted in the discovery of materials associated with the recorded archaeological site CA-LAN-8. Served as crew chief during archaeological testing of this site. Resources were identified and evaluated for eligibility to the National Register of Historic Places.

Solar Millennium Blythe Project, Blythe, CA
Served as Crew Chief for an archaeological survey of a proposed solar electric generating facility in the Chuckwalla Valley. The project included an archaeological survey of the project site and buffer zones, the recordation of historic and prehistoric archaeological sites, and recordation of field data on Department of Parks and Recreation Forms.

Solar Millennium Palen Project, Chuckwalla Valley, CA
Served as Co-Crew Chief for an archaeological survey of a proposed solar electric generating facility in the Chuckwalla Valley. The project included an archaeological survey of the project site and buffer zones, the recordation of historic and prehistoric archaeological sites.

South Region Elementary School #1, Los Angeles, CA
Archaeological Monitor, Lab Technician. Conducted archaeological monitoring in south-central Los Angeles. The area had been in use since 1909 and was the home of several domestic, religious, and retail establishments. Responsible for processing and sorting artifact collection.

Exposition Corridor Light Rail Transit, Los Angeles County, CA
Field Archaeologist. Photo-documented potentially historic buildings along several proposed routes for the new Exposition Light Rail in West Los Angeles, Santa Monica, and Culver City.

Woodland Duck Farm Project, El Monte, CA
Field Archaeologist. Assisted with the Phase I investigation, including a historic structure and archaeological survey of the site of the former historic Woodland Duck Farm.

Lang Ranch, Thousand Oaks, CA
Field Archaeologist. Participated in the archaeological testing of the 46-acre project area. Project work involved the archaeological testing at two artifact isolate locations to determine presence of sub-surface deposits.

Santa Anita Reservoir, Los Angeles County, CA
Field Archaeologist. Assisted with the Phase I archaeological survey of the site of the Santa Anita Dam, Reservoir and Complex.

McCoy Solar, Blythe, CA
Field Archaeologist. Assisted in an archaeological survey of a proposed solar electric generating facility in the Chuckwalla Valley. The project

included an archaeological survey of the project site and buffer zones, the recordation of historic and prehistoric archaeological sites, and recordation of field data on Department of Parks and Recreation Forms.

California High Speed Train Project, Fresno, Madera, and Merced Counties, CA
Field Archaeologist. Assisted in archaeological survey of parcels for a proposed high speed train in Central California. The project included an archaeological survey of the project areas of potential effect and buffer zones, the recordation of historic and prehistoric archaeological resources, and recordation of field data on Department of Parks and Recreation Forms.

Mojave Solar One Project, San Bernardino County, CA
Field Archaeologist. Assisted in an archaeological survey. The project included an archaeological survey of the project areas of potential effect and buffer zones, the recordation of historic and prehistoric archaeological resources, and recordation of field data on Department of Parks and Recreation Forms.

Hansen Dam Project, Los Angeles, CA
Conducted a Phase 1 investigation comprised of an archaeological survey of the Project site, recordation of historic and prehistoric cultural resources, including features and identification of previously recorded sites. Authored an assessment report.

Dixieland TO IV 230 KV T-Line Project, Imperial County, CA
Field Archaeologist. Assisted in the archaeological survey of an alignment for a proposed transmission line. The project included an archaeological survey of the project site, the recordation of historic and prehistoric archaeological resources, and recordation of field data on Department of Parks and Recreation Forms.

Aiso Street Project, Los Angeles, CA
Served as an archaeological monitor during construction for a parking facility in downtown Los Angeles. Duties included documenting historic archaeological features, coordinating work schedules with AECOM staff and on-site construction personnel, and maintaining detailed daily reports. Responsible for processing, sorting and cataloguing the artifact collection for curation. Also made contributions to a report documenting the Project findings and results.

Greenline Right of Way Survey, Los Angeles County, CA
Participated in archaeological field survey of the Greenline right of way from Torrance to LAX in Los Angeles. Tasks included recording of historical and archaeological resources.

Santa Anita Reservoir, Los Angeles County, CA
Assisted in a Phase I investigation, including a historic structure and archaeological survey of the site of the Santa Anita Dam, Reservoir and Complex.

ILWU Local 13 Dispatch Hall Project, Los Angeles, CA
Conducted a Phase 1 investigation comprised of an archaeological survey of the Project site and recordation of archaeological resources. Wrote up the survey results, the Sacred Lands File search results and the Native American Contact program results for the Project cultural technical memo as part of a Draft Initial Study/Mitigated Negative Declaration Report.

Alcazar Yard, Los Angeles, CA
Conducted research for historic building evaluation through the review of building permits at various Department of Building and Safety facilities in Los Angeles County and review of Sanborn Fire Insurance Maps.

St. Jude Hospital, Fullerton, CA
Conducted a survey of the project area and authored survey results.

Octa I-5 Highway Improvements EIR
Orange County, CA
Conducted Native American contact program as part of CEQA.

New Long Beach Courthouse Project
Long Beach, CA
Served as archaeological and paleontological monitor during construction for a new courthouse in the City of Long Beach. Duties included providing worker's training regarding archaeological and paleontological resources for on-site personnel, documenting historic archaeological features and coordinating with clients and AECOM staff. Participated in the testing excavations of early twentieth century privies that were discovered during monitoring. Responsible for processing, sorting and cataloguing the artifact collection for curation. Contributed to a report documenting the Project findings and results.

Genesis Solar, Blythe, CA
Archaeological monitoring for the Genesis solar farm project. Monitored placement of transmission lines, large scale excavation for the placement of solar panels, and caisson drilling for solar panel footings. Aspects of the project included monitoring, survey, testing, and artifact collection. Responsibilities included field lead monitor, recordation and collection of cultural resources discovered during monitoring, survey and scheduling with archaeological, Native American and construction crews.

San Fernando Valley WRP, Los Angeles County, CA
Assisted in a Phase I portion of the project. Tasks included a records search and field survey for potential archaeological resources.

Civic Center Joint Use Project, Santa Monica, CA
Management of a Phase I process. Responsibilities include: a records search, survey of project area, scheduling with AECOM staff, and co-authoring the results. Project is on-going.

NRG Solar, Oasis Solar Field, Environmental Assessment for the City of Palmdale and the United States Air Force, Palmdale, CA
Served as Crew Chief for an archaeological survey. Responsibilities include data collection for historic sites and recordation of field data on Department of Parks and Recreation Forms.

NextEra Energy Resources, LLC: North Sky River Wind Farm
Kern County, CA
Contributing author to a report documenting the historical findings and results.

Los Angeles Dept. of Water & Power, Beacon Solar Energy Project
Kern County, CA
Archaeological monitoring for the Beacon Solar Energy Project. Monitored excavation for the placement of solar panels.. Aspects of the project included monitoring, survey, testing, and artifact collection. Responsibilities included recordation and collection of cultural resources discovered during monitoring and scheduling with Native American and construction crews.

Los Angeles Department of Water and Power, Inyo County, CA
Archaeological Testing for Division Creek and Talus Slope Creek Improvement Projects, Inyo County, California. Responsiblitilies include agency consultation, work plans, permitting, archival research and reporting.

Los Angeles Department of Water and Power: Archaeological Evaluation of Four Sites Near Scotty Spring, Inyo County, CA
Served as Crew Chief for an archaeological survey and assessment of historical structures associated with the Los Angeles Aqueduct. Provided support in US Forest Service consultation, project permitting, budgeting, work plans, and contributed to the report.

Selected Reports

Archaeological Assessment for the Temple Street Widening Project City of Los Angeles, California (contributing author).
Prepared for Los Angeles Department of Public Works-Engineering.
AECOM December 2009.

Negative Archaeological Monitoring Report for the Fire Station 48 Replacement Project City of Seal Beach, California (lead author).
Prepared for the City of Seal Beach.
AECOM August 2010.

Phase I Cultural Resources Assessment for the Topanga Underground Utility District Project City of Topanga, California (contributing author).
Prepared for the Los Angeles County Department of Public Works.
AECOM April 2011.

Archaeological Assessment for the Aiso Street Parking Facility Project, City of Los Angeles, California (contributing author).
Prepared for City of Los Angeles, Department of Public Works.
AECOM July 2011.

Phase I Cultural Resources Investigation 001B Turn-Out Structure, City of PicoRivera, California (lead author).
Prepared for the Water Replenishment District of California.
AECOM February 2013.

Archaeological Assessment for the New Long Beach Courthouse Project, City of Long Beach, California (contributing author).
Prepared for Clark Design Build and Administrative Office of the Courts.
AECOM April 2013.

Reseda Boulevard Pipeline Project, Phase I Archaeological Assessment, Los Angeles County, California (lead author).
Prepared for the Los Angeles Department of Water and Power.
AECOM October 2013.

Archaeological Evaluation of Four Sites and Limited Monitoring Efforts Conducted During Repair and Restoration of Flood Damaged Facilities in Division Creek, Inyo County, California (contributing author).
Prapared for the Los Angeles Department of Water and Power.
AECOM August 2015.

Danielle Flowers
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Grover Beach, CA 93433
(559) 696-.3430
Dflowers805@gmail.com

Education
BA, Anthropology, California State University Fresno, 2007

Experience Summary

Ms. Flowers is an archaeologist with over ten years of experience within California. She has worked as an environmental consultant since 2011 and her primary areas of expertise are California Central Coast and San Joaquin Valley archaeology, with additional experience in Kern County and the Colorado Desert. As a former tribal archaeologist, she has unique and extensive experience in tribal relations, and understands Native American perspectives about archaeology, while maintaining client focus to accomplish project goals. Ms. Flowers has extensive experience surveying, construction monitoring, as well as excavating and curating archaeological materials. She is well practiced in preparing pre-project excavation plans and technical reports to satisfy the requirements of CEQA/NEPA, Fee- to-Trust, Section 106, and Santa Barbara County.

Ms. Flowers is also an experienced ethnographer and historian. She has conducted numerous ethnographic interviews, and for four years she assisted with the development and implementation of Goshowu and Choinumni language preservation programs. She assisted with the planning, research, and development of a tribal cultural museum, mobile exhibitions, curating California Native basketry, and the reconstruction of United States Civil War-era Fort Miller, relocated at Table Mountain Rancheria. Ms. Flowers has also participated in paleontological surveys, biological habitat surveys, quarterly oak tree restoration monitoring, and California tiger salamander drift-fence monitoring.

Project Experience

AVEK Enterprise Water Bank Project
Conducted the records search and field survery. [02/17/2017-04/18/2017]

Lamont Public Utilities District, El Adobe POA Water System Improvement Project, Lamont, CA
Completed Phase a 1 cultural and paleontological survey of the APE including the pipeline corridors. Prepared the Initial Study Checklist and Phase 1 report. [09/27/2016-Present]

Shell, Gaviota Marine Terminal Project, Gaviota, California
Completed test unit and trench excavations to determine the presence or absence of subsurface archaeological materials along the boundaries of previously identified sites within the APE. Monitored for archaeological resources during construction and ground disturbance phases of the project. [2014-Present]

Waste Management, McKittrick Landfill Expansion Project, McKittrick, California.
Monitored for paleontological resources during project construction and ground disturbance. Identified, recorded, and submitted one archaeological site and record. [10/02/2015-05/03/2016]

Chevron Environmental Management Company, Escolle Lease Remediation Project, Orcutt, California.
Conducted Phase 1 pedestrian survey and recorded the sites identified within the project area. Prepared the plan and led the field crew for Extended Phase 1 sub-surface testing, acted as point of contact for Native American consultation, prepared and conducted the Worker Education Awareness Program, monitored construction and recorded unanticipated discoveries. [10/17/2012-12/20/2015]

NextEra, McCoy Solar Energy Project, Blythe, California.
Monitored construction and identified unanticipated cultural, paleontological, and biological resources during ground disturbance activities. Directed the construction crew on the proper procedures according to the agencies' issued permit conditions. [08/01/2015-12/10/2015]

Conoco Phillips, California Orphan Pipeline Abandonment Program Final Asset Disposition Evaluation, San Luis Obispo, Santa Barbara, and Kern Counties, California.

Performed surveys of pipeline segments as part of the final asset disposition evaluation portion of the California Orphan Pipeline Abandonment Program. Collected pipeline information including paths and elevations, segment start and end points, valve and tap locations, and potential sensitive area observations with a GPS unit. [01/01/2012-12/31/2014]

Santa Maria Energy, Careaga Oil and Gas Lease Oak Restoration, Orcutt, California.
Performed health assessment and maintenance of seedlings and nurture oaks under the Santa Maria Energy Live Oak Tree management plan. The plan was developed based on Santa Barbara County grading ordinance guidelines for Native Oak tree removal, to avoid the net loss of coast live oak (*Quercus agrifolia*) trees on the oil field due to operation and development. [01/01/2012-11/30/2015]

Santa Maria Energy LLC, LCSD Recycled Water Pipeline Project Phase 3, Santa Maria, California.
Conducted a supplemental Phase 1 archaeological survey for the Laguna County Sanitation District recycled water pipeline - Phase 3. Prepared an addendum report containing the results to be combined with the cultural documents from the previous project phases. [01/01/2014-08/31/2014]

Phillips 66 - Bartlesville, Blunt-Nosed Leopard Lizard Pedestrian Survey, Various Locations, California.
Participated in a pedestrian survey to identify blunt-nosed leopard lizard (*Gambelia sila*) within the project area. The survey was in response to biological permit requirements in Kern County. [04/01/2014-08/01/2014]

Golden Gate Oil, LLC, Well Pad Permitting Support, Santa Maria, California.
Conducted a Phase 1 pedestrian survey and prepared the technical report for SMV 17b well pad project. The survey and report were part of a land use permit application submitted to the Santa Barbara County Planning and Development Department. [01/01/2014-07/31/2014]

Golden Gate Petroleum, Inland Well Pad - Permitting Assistance, Santa Maria, California.
Conducted a Phase 1 pedestrian survey and prepared the technical report for SMV 16b well pad project. The survey and report were part of a land use permit application submitted to the Santa Barbara County Planning and Development Department. [02/01/2014-06/30/2014]

Chevron Environmental Management Company, Exploration & Production - Environmental Impact Reports, Bakersfield, California
Prepared the cultural resources section for an environmental impact report submitted to Kern County. [01/04/2013-06/16/2014]

Chevron Environmental Management Company, Escolle CTS Drift Fence Study, Orcutt, California
Conducted California tiger salamander (Ambystoma californiense) drift-fence monitoring in support of Santa Barbara County-issued biological permit requirements. [10/24/2011-05/01/2014]

City of Paso Robles, Gateway Mixed Use Project - Environmental Impact Report, Paso Robles, California
Prepared the cultural and paleontological sections of the environmental impact report. The project area is located where the traditional tribal territory of the Obispeno Chumash transitions to the territory of the Salinian. [12/01/2013-02/28/2014]

Pacific Coast Energy Company LP, New Love Restoration, Orcutt, California
Conducted on-call emergency impact assessment surveys in response to petroleum oil seeps and prepared the associated technical reports. The project is located on a developed oil and gas field with the California state-designated Orcutt oil field, located in the Soloman Hills. The oil field was the site of the early-twentieth century company town of Newlove. The report required extensive research about life in the early twentieth-century Orcutt oil field. [01/16/2013-01/31/2014]

Chevron Environmental Management Company, Silva Lease 2013, Santa Maria, California
Prepared an archaeological Phase 1 survey needs assessment of the Silva oil and gas lease to assist the client with planning for potential land use permitting requirements from the county of Santa Barbara. The assessment included a review of archaeological site records within the vicinity of the lease. [01/09/2013-07/31/2013]

NextEra Energy Inc., McCoy Solar Energy Project, Blythe, California
Archaeological survey of Bureau of Land Management-administered lands located in the southern California inland desert. The project area falls within the traditional territories of the Colorado River Indian Tribes. Areas surveyed included portions of General Patton's World War II Desert Training Center, opened in 1942 (renamed the California-Arizona Maneuver Area in 1943). [10/01/2012-12/31/2012]

ERG Resources, Natural Resources Support, Santa Maria, California
Prepared a cost estimate for a Phase 1 archaeological survey within the Cat Canyon oil field. [06/01/2012-12/31/2012]

NextEra, North Sky River Wind Energy Project, Ontario, California
Sorted, identified, and cataloged the artifacts collected during the construction phase of the project to prepare for data analysis and curating. The artifacts were recovered from the Tehachapi Mountains in Kern County, in the traditional territory of the Kawaiisu and Tubatulabal tribes. [01/01/2012-12/31/2012]

Chevron Environmental Management Company, Tognazzini and Chiloensis Leases, Guadalupe, California
Performed a Phase 1 survey and prepared the corresponding report that was submitted to the Santa Barbara County Planning and Development Department as part of a land use and grading permit application to begin remediation of contaminated soils on a former oil and gas lease. Facilitated the Native American consultation as required by CEQA, and during the construction phase of the project, was on site for construction monitoring. [01/01/2012-12/31/2012]

California High Speed Rail Authority, Presence/Absence Testing, Fresno, California
Completed test excavations to determine the presence or absence of archaeological materials in soils located along the proposed California High Speed Rail corridor. [01/01/2012-12/31/2012]

NextEra, North Sky River Wind Energy, Tehachapi Mountains, California
Conducted construction monitoring for a large-scale wind energy project located on over 13,000 acres within unincorporated Kern County. Additionally, she performed surveys, recording archaeological sites as they were discovered, and supervised the Native American monitors. The project area contained over 100 archaeological sites, and included rock art, habitation sites, and human remains. Contributor to the report. [02/27/2012-08/05/2012]

ERG Resources, Fugler 880 Lease, Santa Maria, California
Participated in a biological habitat assessment to identify the potential for the presence of sensitive biological resources on the ERG, Fugler 880 Lease. The Lease is located in the southeastern portion of the Santa Maria Valley, within the California State Designated oil and gas field, and has been actively producing since the early 1900s. [12/01/2011-07/31/2012]

Table Mountain Rancheria, Tribal Cemetery Expansion Project, Friant, California
Performed a pedestrian survey and prepared site records for archaeological sites surrounding the Table Mountain Rancheria cemetery properties prior to a planned expansion of the historic tribal cemetery boundaries. [01/01/2010-09/01/2011]

Table Mountain Rancheria, Tribal Cemetery Unmarked Grave Identification, Friant, California
Worked under the direction of the standing chairman and former chairman of the Department of Anthropology at California State University Fresno to identify the locations of graves in the Table Mountain Rancheria Tribal Cemetery. The project team used a combination of methods to locate unmarked graves including soil profile analysis, GIS, and photo-imaging overlay with historic photographs. [01/01/2010-09/01/2011]

Sierra Foothill Conservancy, CA-3423/H, Friant, California
Performed pedestrian survey, excavation, site recording, lab artifact analysis, and co-authored and prepared the technical report. The report was submitted to the Bureau of Indian Affairs as part of Section 106 ongoing tribal consultation. [01/01/2010-09/01/2011]

California Department of Transportation, Friant Cove Rest Stop, Friant, California
Table Mountain Rancheria Tribal representative/monitor during the construction of Friant Cove rest stop. [06/01/2011-07/31/2011]

Training
OSHA 8-Hour HAZWOPER Refresher
OSHA 40-Hour HAZWOPER Training
First Aid/CPR
Places that Count: Identifying and Managing Traditional Cultural Properties

Certifications
GPS Field Data Collection
Chevron Loss Prevention Systems

Shell Life Saving Rules

Professional Memberships
Society for California Archaeology
San Luis Obispo County Archaeological Society
Fresno County Archaeological Society

Employment History
2016 – Present, Independent Archaeologist/Paleontologist
2011 – Present, AECOM, Environmental Scientist II - Archaeologist
2006 – 2011, Table Mountain Rancheria, Archaeologist

Allison Hill

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Education

MA Candidate,
Public Archaeology
California State University, Northridge
Expected Graduation Date: May 2017

BA, Anthropology/History
California State University, Fullerton
Graduation Date May 2011.

Years of Experience

CRM 5 years
Curation 1 year

Technical Specialties

Field Survey & Excavation

Construction Monitoring

Data Management

CHRIS Record Searches

Technical Writing

Lithic Analysis

Microwear Analysis

Flint Knapping

Professional Summary

With six years of experience as a North American archaeologist and a museum curation assistant working on projects in California and Colorado, I have participated in major monitoring, survey, and excavation efforts as a crew member, supervisor, and data manager. I have assisted in the management of large artifact collections and associated electronic data sets. I have conducted numerous record searches using the California Historical Research Information System (CHRIS). Further, I have contributed to technical report writing efforts and have experience completing Department of Parks and Recreation site recording forms for several projects. My analytical training is in flaked stone analysis, microwear analysis, and experimental archaeology.

Work Experience

Aug. 2014- Present **Los Angeles Metropolitan Authority (Metro) Regional Connector Project.** Archaeological Technician with AECOM. Assisting with the management and organization of documentation from field monitoring efforts as well as working as an archaeological monitor for construction activities associated with the project. Experience includes updating and maintaining databases, writing technical monthly updates, monitoring excavations in urban settings, documenting work activities and results of monitoring, recording archaeological resources, and completing appropriate forms. Client: Los Angeles County Metropolitan Transportation Authority.

Feb. 2015- Present **Los Angeles Metropolitan Authority (Metro) Crenshaw/LAX Transit Corridor Project.** Archaeological Technician with AECOM. Assisting with the management and organization of documentation from field monitoring efforts as well as working as an archaeological monitor for construction activities associated with the project. Experience includes updating and maintaining databases, writing technical monthly updates, monitoring excavations in urban settings, documenting work activities and results of monitoring, and recording archaeological resources. Client: Los Angeles County Metropolitan Transportation Authority.

Dec. 2016-Jan. 2017 **Cultural Resource Assessment for the Metro Red/Purple Line Core Capacity Improvements Project, Los Angeles, California.** Archaeological Technician with AECOM. Conducted an archival records search, conducted an archaeological and built environment survey, and contributed to writing the report for the cultural resources assessment. Client: Los Angeles County Metropolitan Transportation Authority.

Mar.2016-June 2016 **Owens Gorge Flow Restoration Project Cultural Resources Sensitivity.** Archaeological Technician with AECOM. Conducted an archival records search, participated in an archaeological survey, and contributed to writing the report for this cultural resources assessment. Client: Los Angeles Department of Water and Power.

April 2016-May 2016 **Cultural Resources Assessment for the Division 6 Title Transfer and Demolition Project, Venice, California.** Archaeological Technician with AECOM. Conducted an archival records search, Native American contact program, and archaeological survey as part of this archaeological assessment. Contributed to writing the Phase I archaeological assessment technical report for the project. Client: Los Angeles County Metropolitan Transportation Authority.

Professional Affiliations

Society for American Archaeology

Society for California Archaeology

Lambda Alpha Anthropology Honors Society

Training and Certifications

OSHA 10 Hour Safety Training

Honors and Awards

Antonio Gilman Award for Excellence in Archaeology, CSU, Northridge, May 2015

James A. Bennyhoff Award, Society for California Archaeology, March 2015

Professional Achievement Award, CSU, Fullerton, May 2011

Community Engagement Medal, CSU, Fullerton, May 2011

Marshalltown Award, San Bernardino National Forest, August 2010

April 2016 **Cultural Resources Assessment Update for the 99th Street Wells Chloramination Station, Watts, City of Los Angeles, California.** Archaeological Technician with AECOM. Conducted the Native American contact program for the most recent update to the project. Tasks included drafting and sending information letters to interested Native American groups and representatives, making follow up phone calls, and contributing to the Native American contact program Appendix of the report. Client: Los Angeles Department of Water and Power.

Feb. 2016-April 2016 **Lower Franklin Reservoir No. 2 Floating Cover Replacement Project, Los Angeles, Los Angeles County, California.** Archaeological Technician with AECOM. Conducted an archival records search, Native American contact program, and archaeological survey as part of this archaeological assessment. Contributed to writing the Phase I archaeological assessment technical report for the project. Client: Los Angeles Department of Water and Power.

Dec. 2015-Mar. 2016 **Bouquet Creek Restoration Project, Los Angeles County, California.** Archaeological Technician with AECOM. Conducted an archival records search, Native American contact program, and archaeological survey as part of this archaeological assessment. Contributed to writing the Phase I archaeological assessment technical report and the cultural section of the IS/MND. Client: Los Angeles County Department of Public Works.

Sept. 2015-Feb. 2016 **Los Angeles Department of Transportation (LADOT) Active Transportation Program – Cultural Resource Evaluation, Los Angeles, California.** Archaeological Technician with AECOM. Conducted archival records searches, archaeological surveys, and Native American contact programs in support of archaeological assessments and contributed to technical reports for several LADOT Active Transportation Program projects located around Downtown Los Angeles. Client: City of Los Angles, LADOT.

Aug. 2015- Sept. 2015 **Topanga Underground Utilities District Project.** Archaeologist with AECOM. Assisted with data recovery as part of mitigation for impacts to cultural resources within the project area. Tasks included excavation, dry screening, water screening and field documentation. Client: Los Angeles County Department of Public Works.

Aug. 2015- Sept. 2015 **El Dorado Duck Pond Restoration Project Cultural Resources Records Search.** Archaeologist with AECOM. Conducted an archival records search at the California Historic Resources Information System South Central Coastal Information Center located on the California State University, Fullerton. Contributed to completing the report which documented the findings of the records search and provided recommendations for future work.

May 2015 **Mount Lee Pumping Station and Pipe Line Project Phase I Archaeological Assessment, Los Angeles County, California.** Archaeological Technician with AECOM. Performed pedestrian survey within all portions of the project area not previously paved or landscaped and contributed to the technical report. Client: Los Angeles Bureau of Engineers.

October 2014 **Native American Cultural Resource Specialist Field School, Chemehuevi Indian Reservation, California.** Instructional Assistant.
Provided instructional and logistical support to a one week Native American monitor training workshop located on the Chemehuevi Indian Reservation. Assisted in teaching students how to read topographic maps, use a compass, identify archaeological sites, conduct pedestrian surveys, and document sites in accordance with professional industry standards.

July 2014 - Aug. 2014
July 2015 - Aug. 2015
July 2016 - Aug. 2016

Applied Archaeology Field School sponsored by San Bernardino National Forest Service, San Manuel Band of Mission Indians, and CSU, San Bernardino. Assistant Instructor with San Bernardino National Forest. Provided instructional support for a five week archaeological field school located in the Cahuilla traditional use area of the San Jacinto and Santa Rosa Mountains. Aided students in learning how to read topographic maps, use a compass, identify artifacts and archaeological sites, conduct pedestrian surveys, draw site maps, and record sites on DPR forms. Supervised student field crews in pedestrian survey and site recording.

June 2014 - July 2014
June 2016 - July 2016

Wind Wolves Preserve Archaeological Project, Kern County, California. Field school supervisor with University of Central Lancashire and International Field Research. Provided instructional support for a four week field school held at the Wind Wolves Preserve, Kern County, California. Aided in instructing students on standard excavation techniques, proper documentation of excavations, artifact identification, artifact collection, and sampling strategies. Supervised students in archaeological excavation and large scale environmental sampling.

Feb. 2014 - May 2014

San Bernardino National Forest Collections Curation at the San Bernardino County Museum. Intern with the San Bernardino National Forest. Repackaged and updated older collections from Forest Service property to meet present museum curation standards. Sorted and identified archaeological materials, inventoried collections and entered information into a computerized database.

Feb. 2014 - Mar. 2014

RTI Rock Art Documentation at Vasquez Rocks Natural Area Park. Volunteer with County of Los Angeles Department of Parks and Recreation. Assisted in documenting various rock art sites within the Vasquez Rocks Cultural Area, using the Reflective Transformation Imaging (RTI) photography method to capture extreme detail of the Tataviam rock art and boulder surfaces.

Jan 2014 -May 2014

Instructional Student Assistant. Anthropology Department at California State University, Northridge. Provided grading and paper editing assistance to professors teaching undergraduate level anthropology courses at CSU, Northridge.

Oct. 2013 - Dec. 2013

Santa Susanna Field Laboratory Survey, Los Angeles County, California. Archaeological Technician with JMA. Crew member on an intensive pedestrian survey intended to identify prehistoric cultural resources within a proposed environmental cleanup area. Participated in pedestrian field surveys of project area, recording of archaeological sites, and writing numerous Department of Parks and Recreation site forms. Client: Boeing.

June 2013 - July 2013

Cultural Resources Phase II Mitigation Survey for the Genesis Solar Energy Project, Riverside County, California. Archaeological Technician with AECOM. Crew member participating in a pedestrian survey along the shore lines of Ford Dry Lake, Riverside County, California. Client: Genesis Solar, LLC.

Mar. 2013 - Aug. 2013

Environmental Impact Report for Six San Joaquin Valley Oil Fields. Archaeological Technician with AECOM. Conducted several record searches at numerous California Historical Resource Information System locations, museums, and BLM offices. Wrote substantial sections of the Environmental Impact Report. Assisted in the data management and technical editing process for this project. Client: Chevron.

May 2012 - Feb. 2013

Unexpected Discovery Mitigation Treatment for the North Sky River Wind Farm, Kern County, California. Archaeological Technician with AECOM. Supported extensive surveys, data recovery excavations, and construction monitoring. Coordinated site-recording data for over 100 sites identified during the field effort. Wrote significant sections of the report and all required Department of

Parks and Recreation site forms. Client: NextEra Energy.

April 2012 **Cel-Syl Transmission Line Archaeological Survey, Highway 395, California.** Archaeological Technician with Power Engineers, Inc. Crew member surveying along a transmission corridor. Client: Los Angeles Department of Water and Power.

Feb. 2012 - Mar. 2012 **Archaeological Monitoring, Old Top Removal Project, LA Aqueduct, Coso Junction, California.** Archaeological Technician with Power Engineers, Inc. Monitored road repair along the Los Angeles Aqueduct. Client: LADWP.

Dec. 2011 - Feb. 2012 **Archaeological Survey of the Blythe II Solar Power Project, Blythe, California.** Archaeological Technician with Power Engineers, Inc. Crew member on an intensive pedestrian survey within the proposed solar development project aimed at identifying and recording cultural resources. Client: RRG Solar.

June 2011- Sep. 2011 **Archaeological Excavations at Crow Canyon Archaeological Center, Cortez, Colorado.** Field Research Intern. Instructed and supervised field school students in basic excavation techniques and archaeological concepts. Assisted in the excavation and recording of the Dillard Site, a Basket Maker III village located on Indian Camp Ranch.

May 2011 - June 2011 **Archaeological Survey of Panamint Project, Tehachapi, California.** Archaeological Technician with AECOM. Crew member on an intensive pedestrian survey aimed at identifying and recording cultural resources within the proposed project area.

Jan. 2011 - May 2011 **Curation Upgrade at the Cooper Center Orange County Curation Facility, Fullerton, California.** Curation Assistant. Repacked older collections to meet modern museum curation standards. Also cataloged collections, sorted and identified archaeological materials, inventoried collections, entered information into a computerized database, and scanned and organized documentation related to the collections.

April 2011 **Introduction to Flint Knapping and Stone Tools Course at CSU, Dominguez Hills.** Instructional Assistant.
Provided assistance to flint knapping expert and instructor Daniel Reeves during a two day course at CSUDH. Aided students in understanding concepts and skills involved in stone tool manufacture through hands on guidance and instruction. The course covered basic principles of stone tool production, including stone fracture patterns, flake and tool attributes, percussion and pressure reduction strategies, and artifacts types.

Aug. 2010 - May 2011 **Artifact Management at the California State University, Fullerton Archaeology Laboratory, California**. Student Laboratory Technician in Archaeological Science. Repacked older collections to meet modern museum curation standards. Also cataloged collections, sorted and identified archaeological materials, inventoried collections, entered information into a computerized database, and scanned and organized documentation related to the collections. Assisted in educational outreach programs for students and the community.

Field School Training

July 2010 - Aug. 2010 **San Bernardino National Forest and CSU, San Bernardino Applied Archaeology Field School**. Student in applied archaeology. In depth training in methods essential to public archaeology and cultural resource management careers. Skills learned include: correct use of a compass and topographic map, identification of artifacts and archaeological features, documenting sites on DRP forms, proper site mapping techniques, and cataloging collections.

July 2010	**Mojave Desert Lithic Procurement and Production Research Project.** Volunteer with CSU, Fullerton. Participated in a pedestrian survey of two lithic quarry sites and strategically selected sample surveys of Soda Lake and Silver Lake in the western Mojave Desert, California. Assisted in updating an analyzing data from Mojave lithic quarry sites.
Jan. 2010 - May 2010	**CSU, Fullerton Archaeology Field Class, Abalone Cover State Beach, Rancho Palos Verdes, California.** Student with CSU, Fullerton. Participated in a semester long field class which provided training in archaeological survey and excavation techniques.

Papers and Publications

Technical Reports

Hill, Allison and Marc Beherec
2016 *Phase I cultural Resources Investigation for the Lower Franklin Reservoir No. 2 Floating Cover Replacement Project, Los Angeles, Los Angeles County, California*. Submitted to Los Angeles Department of Power and Water. Los Angeles, California.

Hill, Allison and Marc Beherec
2016 Bouquet Creek Restoration Project Phase I Cultural Resources Assessment, Los Angeles County, California. Submitted to Los Angeles County Department of Public Works. Alhambra, California.

Hill, Allison
2015 Cache Cave Lithic Analysis Report. Submitted to Santa Barbara Museum of Natural History. Santa Barbara, California.

Beherec, Marc A., M.K. Meiser, and Allison Hill
2015 *Mount Lee Pumping Station and Pipe Line Project Phase I Archaeological Assessment, Los Angeles County, California*. Submitted to Los Angeles Bureau of Engineering, Los Angeles, California.

Beherec, Marc A. and Allison Hill
2015 *El Dorado Duck Pond Restoration Project Cultural Resources Records Search*. Submitted to City of Long Beach. Long Beach, California.

Garfinkel, Alan Gold, Christopher Aquino, Arrie Bachrach, Allison Hill, Angela Keller, Linda Kry, and Jennifer Munoz.
2012 *North Sky River Wind Energy Project Cultural Resources Compliance Program, Kelso Valley, Kern County, California.* Submitted to Kern County Department of Planning and Development. Bakersfield, California.

Conference Papers

Hill, Allison
2016 Social and Economic Implications for Identifying Basketry Production in the California Archaeological Record: A Case Study from the Interior Chumash Region. Paper presented at the 81st Annual Meeting of the Society for American Archaeology, Orlando.

Hill, Allison
2016 Lithic Procurement Patterns in the San Emigdio Hills of South Central California. Paper presented at the 50th Annual Meeting of the Society for California Archaeology, Ontario.

Hill, Allison
2015 Assessing the Use of Lithic Artifacts in the Manufacture of Fiber Technologies at Cache Cave, Bakersfield, California. Paper presented at the 80th Annual Meeting of the Society for American Archaeology, San Francisco.

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Brendan Fitzsimons

Archaeologist / Cultural Compliance

Experience:

Montgomery Archaeological Consultants, Moab, UT
June 2016 to present
Archaeological Technician

I have participated in survey and recordation in support of several undertakings by the Utah Department of Wildlife Resources and the School and Institutional Lands Administration in the La Sal Mountains, Dark Canyon Wilderness Area, Tavaputs Plateau, Nine Mile Canyon and Comb Ridge areas. Resources discovered and documented include Pueblo II-III habitation sites, prehistoric seasonal camps, rock art sites and lithic procurement areas. Historic resources encountered include historic cabins and ranching features, a shaft mine and two sawmill sites.

POWER Engineers, Inc., Anaheim, CA
April 2016 to June 2016
Archaeological Technician

I participated in survey and site recordation in support of a seismic project near Salton City, CA. Resources discovered and documented included prehistoric seasonal camps, human cremations and lithic procurement sites as well as a prehistoric pottery production site.

AECOM, Inc., San Diego, CA
January 2015 to January 2016
Cultural Compliance Monitor

I have provided cultural compliance services on the Blythe Solar Energy Project near Blythe, CA for one year as both a compliance monitor and intermittently as the acting compliance lead.

- I coordinated with contractors and compliance staff to identify compliance needs and requirements and to resolve issues.
- provided necessary compliance information and support to construction personnel in addition to monitoring construction activities.
- enforced compliance protocols in the event that cultural resources were discovered or impacted.
- provided direction and oversight to other compliance personnel.
- performed daily documentation and reporting of activities, resources encountered, issues and their resolutions as well as the documentation and collection of cultural material for analysis and curation.

Montgomery Archaeological Consultants, Moab, UT
February 2014 to November 2014

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Brendan Fitzsimons

Archaeological Technician

I participated in archaeological survey on Ute tribal lands in the Uinta and Ouray Reservation in northeast Utah. This was a large scale block survey of approximately 16,000 acres performed in advance of oil and gas development in the Uinta Basin. Resources discovered and documented included prehistoric seasonal camps and lithic procurement sites as well as protohistoric and historic Ute and Anglo sites associated with sheep herding and cattle ranching.

ECORP Consulting, Rocklin, CA
November 2013 to January 2014
Cultural Compliance Monitor

I provided cultural compliance services on the Desert Sunlight Solar Farm in Desert Center, Ca for three months.

- I coordinated with contractors and compliance staff to identify compliance needs and requirements and to resolve issues.
- provided necessary compliance information and support to construction personnel in addition to monitoring construction activities.
- enforced compliance protocols in the event that cultural resources were discovered or impacted.

Aecom, Inc., San Diego CA
September 2011 to September 2013
Cultural Compliance Monitor

I have provided cultural compliance services on the Genesis Solar Energy Project near Blythe, CA for almost two years as both a compliance monitor and intermittently as the acting compliance lead.

- I coordinated with contractors and compliance staff to identify compliance needs and requirements and to resolve issues.
- provided necessary compliance information and support to construction personnel in addition to monitoring construction activities.
- enforced compliance protocols in the event that cultural resources were discovered or impacted.
- provided direction and oversight to other compliance personnel.
- performed daily documentation and reporting of activities, resources encountered, issues and their resolutions as well as the documentation and collection of cultural material for analysis and curation.

Tierra Environmental, San Diego, CA
January 2011 to August 2011
Archaeologist

For eight months I participated in recordation efforts on numerous prehistoric sites in advance of the construction of the Ocotillo Express Wind Facility in Southeastern California.

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Brendan Fitzsimons

- I led a crew in the field, providing guidance to field personnel in the mapping of sites and the documentation of artifacts and features.
- specialized in the detailed description of lithic and groundstone artifacts as well as diverse features including lithic procurement areas, groundstone production areas, agave roasting and processing sites as well as ceremonial sites.

Aecom, INC., San Diego, CA
September 2009 to December 2010
Archaeological Technician/ Cultural Compliance Monitor

For 15 months I performed a variety of tasks on projects in both California and Nevada including the Sterling Transmission Line and the Solar Millennium Solar Energy Project.

- I provided cultural compliance monitoring.
- participated in survey and site recordation.
- provided detailed, data recovery level description of lithic artifacts.

Natural Resources Conservation Service – United States Dept. Of Agriculture
Price, Utah
August 2005 to August 2009
Archaeological Technician

In four years with NRCS I provided statewide cultural resource assistance to the Cultural Resources Specialist and NRCS staff to ensure compliance with Section 106 of the National Historic Preservation Act and the Memorandum of Understanding(MOU) between the Utah NRCS and the Utah State Historic Preservation Office as well as the Tribal Historic Preservation Office of the Navajo Nation.

- I conducted cultural resource inventories, field investigations and compliance monitoring to ensure compliance with federal law in the implementation of various conservation measures.
- provided cultural resource support for the National Cooperative Soil Survey in the backcountry of Canyonlands and Arches National Parks and Natural Bridges and Hovenweep National Monuments. Support included research, survey, compliance monitoring and the preparation of an annual report. During the course of this work I inventoried 187 new cultural sites.
- provided area-wide training of NRCS staff in cultural resource protocols and Section 106 NHPA compliance.

Edaw, Inc., San Diego, CA
January 2000 to July 2005
Staff Archaeologist

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Brendan Fitzsimons

In five and a half years at Edaw I performed a wide variety of duties relating to Cultural Resource Management serving a broad range of clients including the Bureau of Reclamation, the Bureau of Land Management and the Southwest Division of the US Navy.

- I monitored construction activities to ensure compliance with both state and federal laws and guidelines.
- participated in field efforts including survey, recordation, mapping, excavation and data recovery including the excavation and repatriation of human remains.
- participated in laboratory analyses and preparation of specimens for outside analysis and curation.
- I have contributed to the writing of research designs and final reports as well as preparing official site forms and updates.

Arizona State Parks, Cottonwood, AZ/ Sedona, AZ
April 1998 to October 1999
Park Ranger

In 18 months with AZ State Parks my duties were divided between the Verde River Greenway (Riparian Preservation Area) at Dead Horse Ranch State Park and Red Rock State Park (Nature Preserve).

- I was responsible for the monitoring and stewardship of cultural and biological resources, ensuring compliance with park policies as well as state and federal guidelines.
- I developed and presented environmental education programs relating to park resources including cultural resources, animals and plants.

Related Training and Education

Elden Pueblo Field School, Flagstaff, Arizona
1996 to 1999
I attended three archaeological field schools including Crew Member I, Crew Member II, and Mapping.

Colton Research Center, Flagstaff, Arizona
1994 to 1996
I completed a two year program of study of the Colorado Plateau including archaeology with David Wilcox, PhD, and ceramic typology and technology with Richard Ambler, PhD., and Kelley Hays-Gilpin, PhD.

Advisory Council on Historic Preservation Section 106 Essentials, March 2006

USDA Working Effectively with Tribal Government, September 2008

USDA Working Effectively with American Indians, November 2008

SWCA Comprehensive NEPA, March 2009

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Brendan Fitzsimons

SWCA The Cultural Side of NEPA, June 2009

Wilderness Medicine Institute/ National Outdoor Leadership School
Wilderness First Responder Certification, March 2008

References:
Will be made available on request.

Appendix F: Hydrology and Hydraulics Study

Hydrology and Hydraulics Study for

High Desert Water Bank

Antelope Valley - East Kern Water Agency

The purpose of this report is to estimate the hydrologic impacts from construction of water infiltration facilities on Portions of Sections 1, 2, 11, and 12 of Township 8 North, Range 17 West, northwest of the unincorporated community of Neenach in Los Angeles County, California.

By:

AECOM
5001 E. Commercenter Drive, Suite 100
Bakersfield, California 93309

Project No. 60537613

May 25, 2017

Daniel S. Cronquist, P.E.

Abbreviations & Acronyms

Agency	Antelope Valley - East Kern Water Agency
cfs	cubic feet per second
CN	Curve Number
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
fps	feet per second
ft	feet
IDF	Intensity Duration Frequency
KCHM	Kern County Hydrology Manual
min	Minutes
NOAA	National Oceanographic and Atmospheric Administration
NRCS	National Resource Conservation Service
SWP	State Water Project
T_c	Time of Concentration
USDA	U.S. Department of Agriculture
USGS	U.S. Geologic Survey

1.0 General

1.1 Introduction

AECOM was retained by the Antelope Valley – East Kern Water Agency (Agency) to prepare a hydrologic and hydraulics study for the proposed High Desert Water Bank Project (Project). The purpose of this report is to estimate the quantity of runoff tributary to the project site, where it enters the project site, approximate the depth of flow, and where it exits the project site.

The project consists of approximately 1,550 acres bounded by Avenue A to the north (Kern / Los Angeles County line), 300th Street West to the west, 280th Street West to the east, and the California Aqueduct to the south (see **Figures 1** and **2**).

This study is not intended for use in determining impacts to wildlife habitat or delineation of areas of federal or state jurisdiction.

1.2 Project Description

The project is a groundwater recharge and recovery program to store State Water Project (SWP) water from the California Aqueduct. Recharge water will be conveyed through permanent and temporary pipes to retention basins bounded by low earthen berms which will generally follow existing contours. Retained water will then infiltrate, and recharge the groundwater. Groundwater will then be extracted using a series of wells located throughout the project site. The proposed storage and retrieval methods allow the Agency to store water during wet years when SWP allocations exceed demand to make up for dry conditions in subsequent years when SWP allocations are small or disrupted.

1.3 Description of Watershed

1.3.1 Project Area Characteristics

The project site is located at the western end of Antelope Valley, California between the southern slope of the Tehachapi Mountains and the northern slope of the San Gabriel Mountains in the Mojave Desert. Seven (7) major streams are tributary to the project site as described below a (see **Figure 3**).

Antelope Canyon Creek is an unnamed stream originating from Antelope Canyon in the Tehachapi Mountains north of the project site. The stream is tributary to approximately 4,267 acres with a total elevation difference of approximately 1,845 feet. The stream is confined within the mountains and spreads into an alluvial fan once it is within Antelope Valley.

Pescado Creek is a named blue-line stream on U.S. Geographic Survey (USGS) topographic maps originating from the Tehachapi Mountains north of the project site. The stream is tributary to approximately 7,927 acres with a total elevation difference of approximately 3,000 feet. The stream is confined within the mountains and spreads into an alluvial fan once it is within Antelope Valley.

Big Sycamore Canyon Creek is a named blue-line stream on USGS topographic maps in the Tehachapi Mountains north of the project site. The stream has a well-defined channel and is

tributary to approximately 4,751 acres with a total elevation difference of approximately 1,800 feet. The stream is confined within the mountains and spreads into an alluvial fan once it is within Antelope Valley.

Oso Canyon Creek is a named blue-line stream on USGS topographic maps and originates from the San Gabriel Mountains west of the project site. The stream is tributary to approximately 21,710 acres with a total elevation difference of 2,163 feet. This watershed includes Little Sycamore Canyon Creek, which is a separate named blue-line stream that joins with Oso Canyon Creek upstream of the project site. The stream crosses the California Aqueduct twice, confining it to a relatively narrow area on the west side of the project site.

Tentrock Canyon Creek is an unnamed stream originating from Tentrock Canyon in the San Gabriel Mountains south of the project site. The stream is tributary to approximately 5,890 acres with a total elevation difference of 2,575 feet. The stream is diverted by the California Aqueduct into a flume crossing above the aqueduct. Downstream of the flume flow is unrestricted.

Horse Camp Canyon Creek is an unnamed stream originating from Horse Camp Canyon in the San Gabriel Mountains south of the project site. The stream is tributary to approximately 1,983 acres with a total elevation difference of 936 feet. The stream is diverted by the California Aqueduct into a flume crossing above the aqueduct. Downstream of the flume flow is unrestricted.

Cow Springs Canyon Creek is an unnamed stream originating from Cow Springs Canyon in the San Gabriel Mountains south of the project site. The stream is tributary to approximately 3,619 acres with a total elevation difference of 2,755 feet. The stream is diverted by the California Aqueduct into a flume crossing above the aqueduct. Downstream of the flume flow is unrestricted.

1.3.2 FEMA Flood Zones

The confluence of the streams previously described occurs within the project site, which is then tributary to Rosamond Dry Lake; an endorheic basin. The project site includes “Zone A” and “Zone X” as designated on Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps[1]. These flood zones are shown in **Figure 4**.

The upstream western half of the site is designated Zone A, which indicates this area can be inundated by the 1% annual chance flood (100-year storm). The downstream eastern half of the site is designated Zone X. Zone X indicates areas either inundated by the 0.2% annual chance flood (500-year storm) or areas of 1% annual chance flood with average depths less than 1 foot. From this information it appears that flood depth and frequency decreases downstream towards the east. FEMA did not determine a base flood elevation.

[1] FEMA FIRM Map Number 06037C0075F; dated September 26, 2008.

1.3.3 Soil Conditions

The Natural Resources Conservation Service (NRCS), a division of the U.S. Department of Agriculture (http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx), classifies the floor of the Antelope Valley primarily as Hydrologic Soil Group "B". The channels and alluvial fans are classified as Hydrologic Soil Group "A". The mountainous area in the upper reaches is primarily classified as Hydrologic Soil Group "B" and "C". See **Figure 5**.

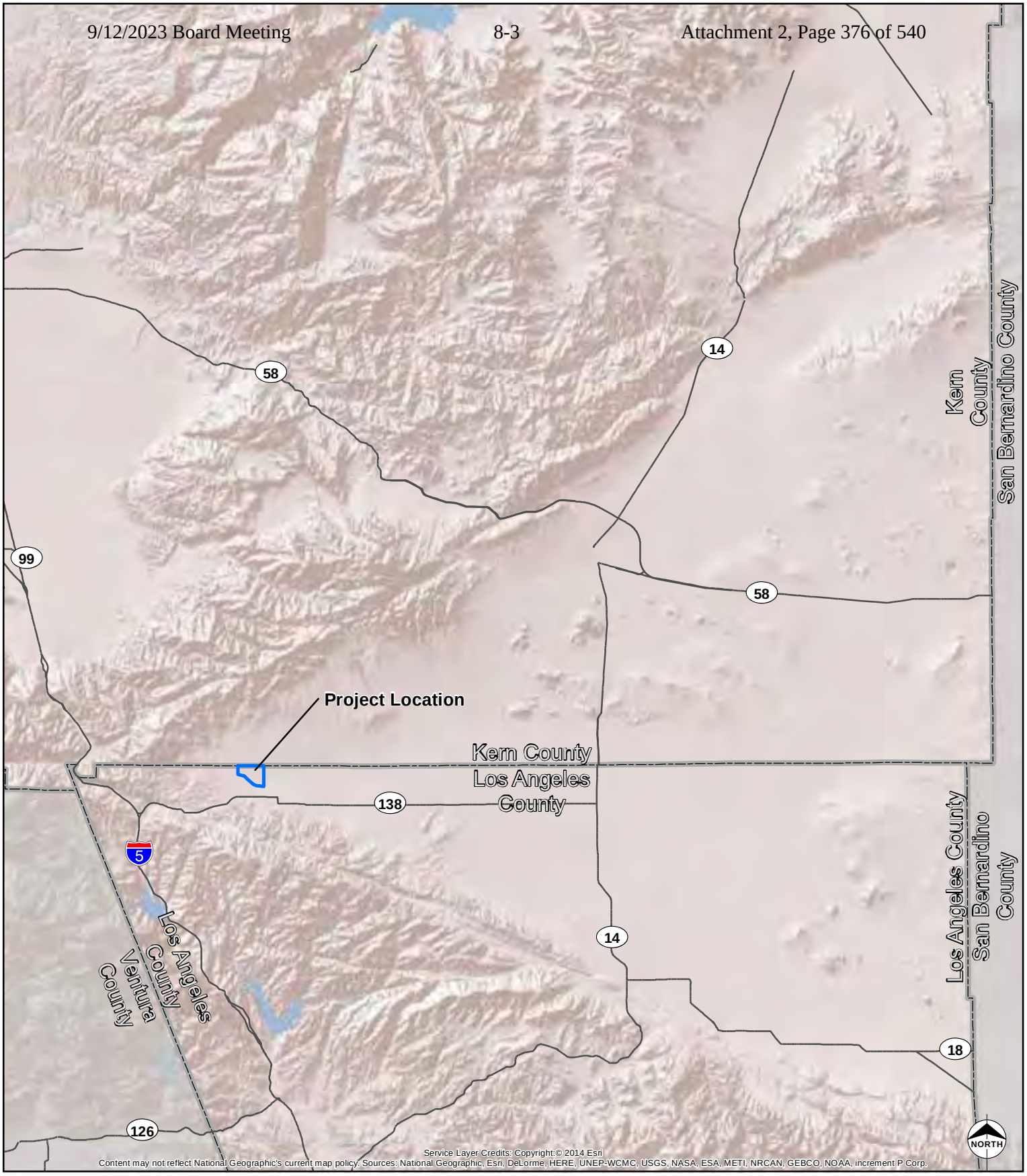
1.3.4 Vegetation

KCHM Figure C-2 (see Appendix A) divides vegetative cover into eight (8) separate categories, which are subdivided as poor, fair, or good quality of cover. Generally the upper reaches of each watershed is considered "Woodland" as it consists of conifers (Jeffery Pine, Ponderosa Pine, Gray Pine) and deciduous (oak, sycamore, and cottonwood). The alluvial fans and base of Antelope Valley is considered "Chaparral, Narrowleaf" and consists of sage, yucca, and creosote. Cleared agricultural land and exposed rock is classified as "Barren".

1.3 Study Methodology

Because the project site is located within the unincorporated area of Los Angeles County, typically the "Hydrology Manual" prepared by the Los Angeles County Department of Public Works would be used. Calculation of runoff using this manual, however, requires the use of soils and rainfall data that is only provided within the limits of Los Angeles County. Thus it would not be possible to estimate runoff originating from Kern County using this manual.

The Kern County Hydrology Manual (KCHM) does not have the same limitations and can provide runoff estimates for the entire watershed in both counties. To be consistent and conservative, the KCHM is used for all watersheds evaluated in this report. Because the watersheds tributary to the project area are greater than 1 square mile, the peak flow is estimated using the Unit Hydrograph Method as described in, Section "E" of the KCHM. The calculations associated with this method were performed using the software "CivilDesign" by Joseph Bonadiman.



OVERVIEW MAP

Legend

- Project Area
- County Boundaries
- Highways

0 10
Miles

Scale1:633,600
1 inch = 10 miles

High Desert Water Bank
Antelope Valley -
East Kern Water Agency

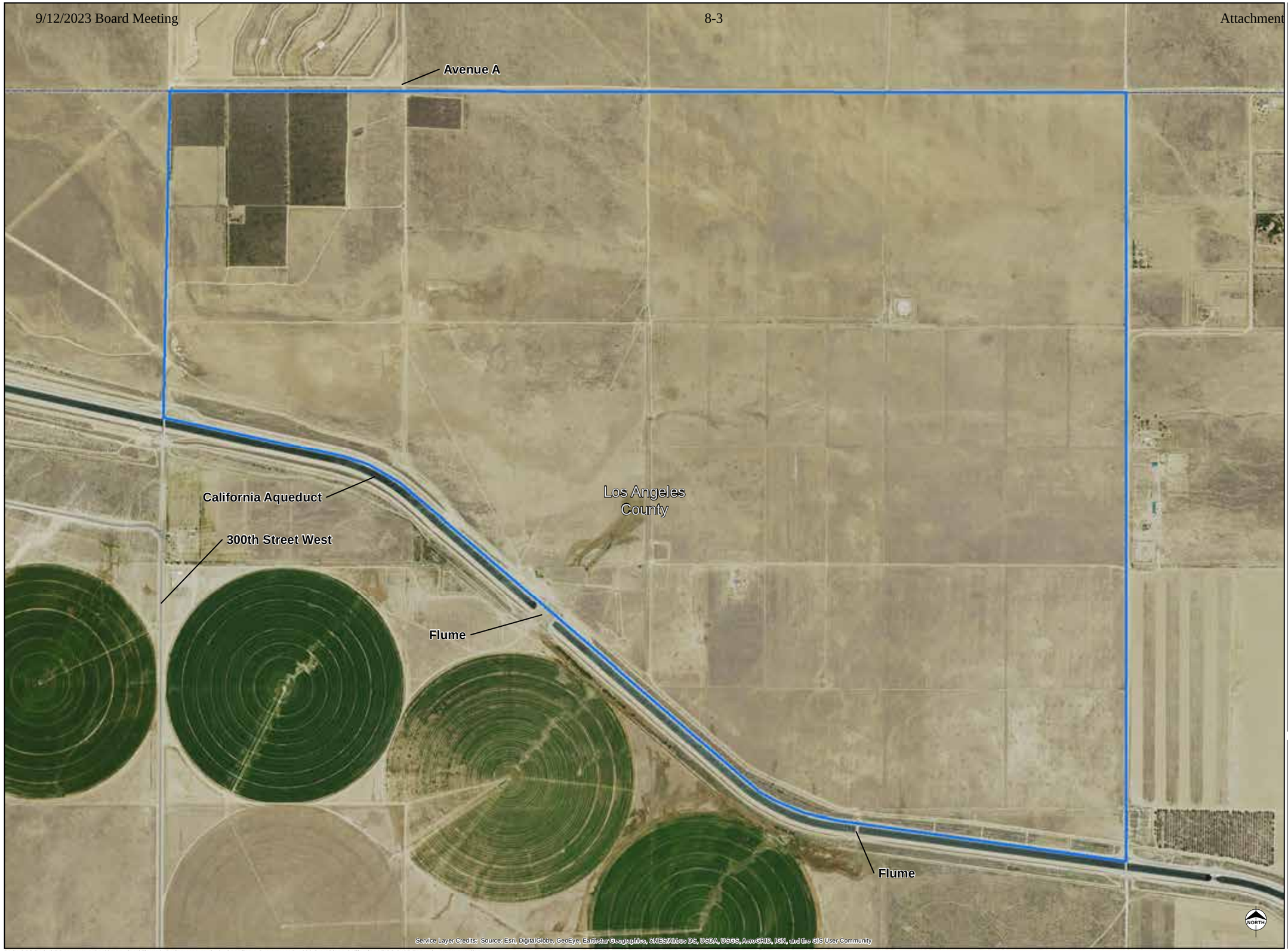
Regional Map

Date: 5/11/2017
Project: 60537613.0002

AECOM

Figu

Path: G:\Other\HighDesertWaterBank\map_docs\Figure1.mxd



Legend

Project Area

Scale 1:12,000

1 inch = 1,000 feet

0 500 1,000 1,500
Feet

0 100 200 300
Meters

High Desert Water Bank
Antelope Valley - East Kern Water Agency

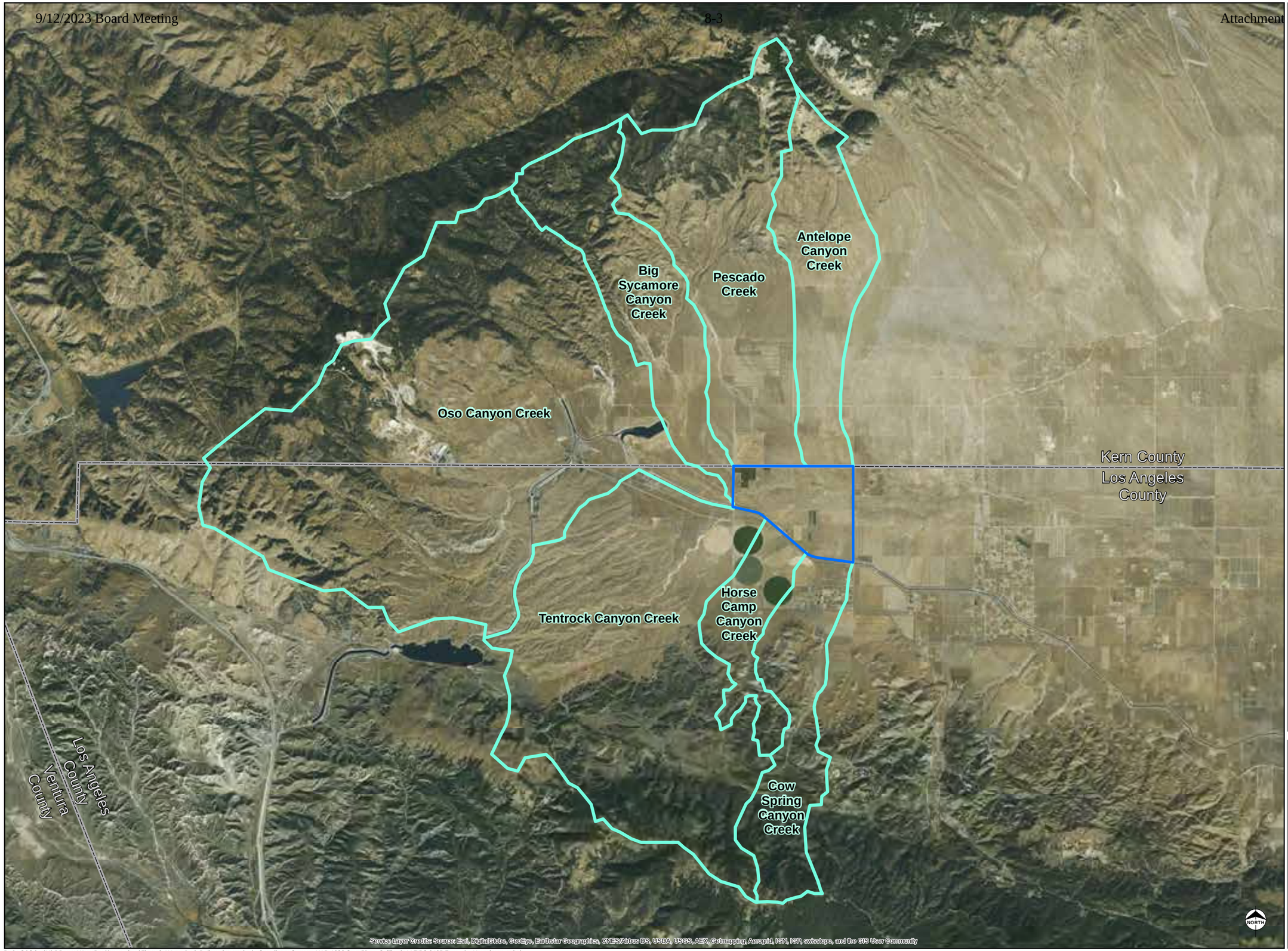
Project Area

Date: 5/11/2017 Project: 60537613.0002

AECOM

Figur

Path: G:\Other\HighDesertWaterBank\map_docs\Figure2_ProjectArea.mxd | Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet | User: augellop



Legend

- Project Area
- Watershed Boundary
- County Boundaries

Scale 1:96,000

1 inch = 8,000 feet

0 4,000 8,000 12,000
Feet

0 1,000 2,000 3,000
Meters

High Desert Water Bank
Antelope Valley - East Kern Water Agency

Watershed Delineation

Date: 5/11/2017 Project: 60537613.0002

AECOM

Figur

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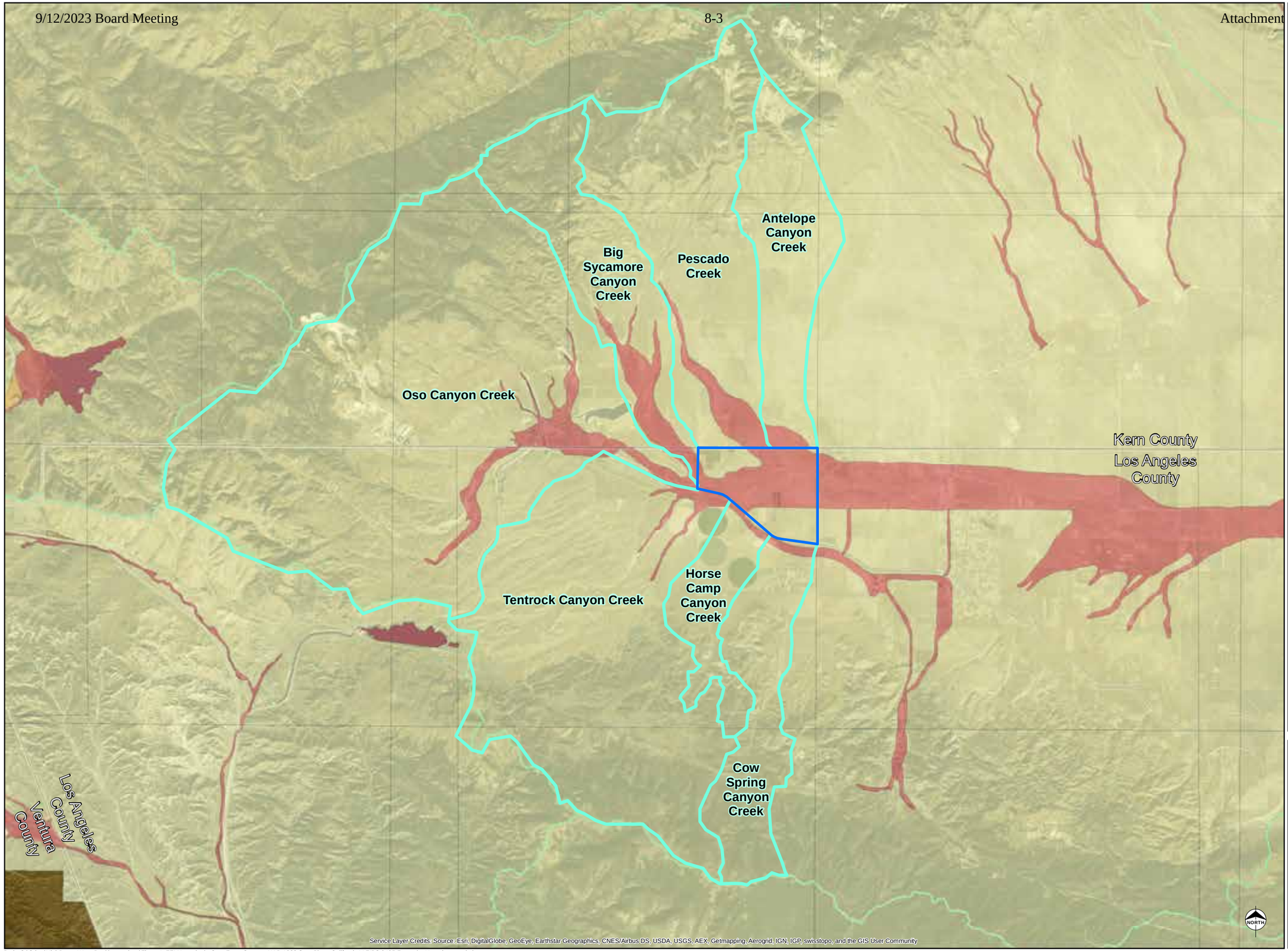


Legend

- Project Area
- Watershed Boundary
- County Boundaries

FEMA Flood Zones

Moderate to Low Risk Areas

- X: Area determined to be outside the 100- and 500-yr floodplains
- X500: Area inundated by 500-yr flooding

High Risk Areas

- A: Area inundated by 100-yr flooding, for which no BFEs have been established

Undetermined Risk Areas

- D: Area of undetermined but possible flood hazards

Scale 1:96,000
1 inch = 8,000 feet

0 4,000 8,000 12,000
Feet

0 1,000 2,000 3,000
Meters

High Desert Water Bank
Antelope Valley - East Kern Water Agency

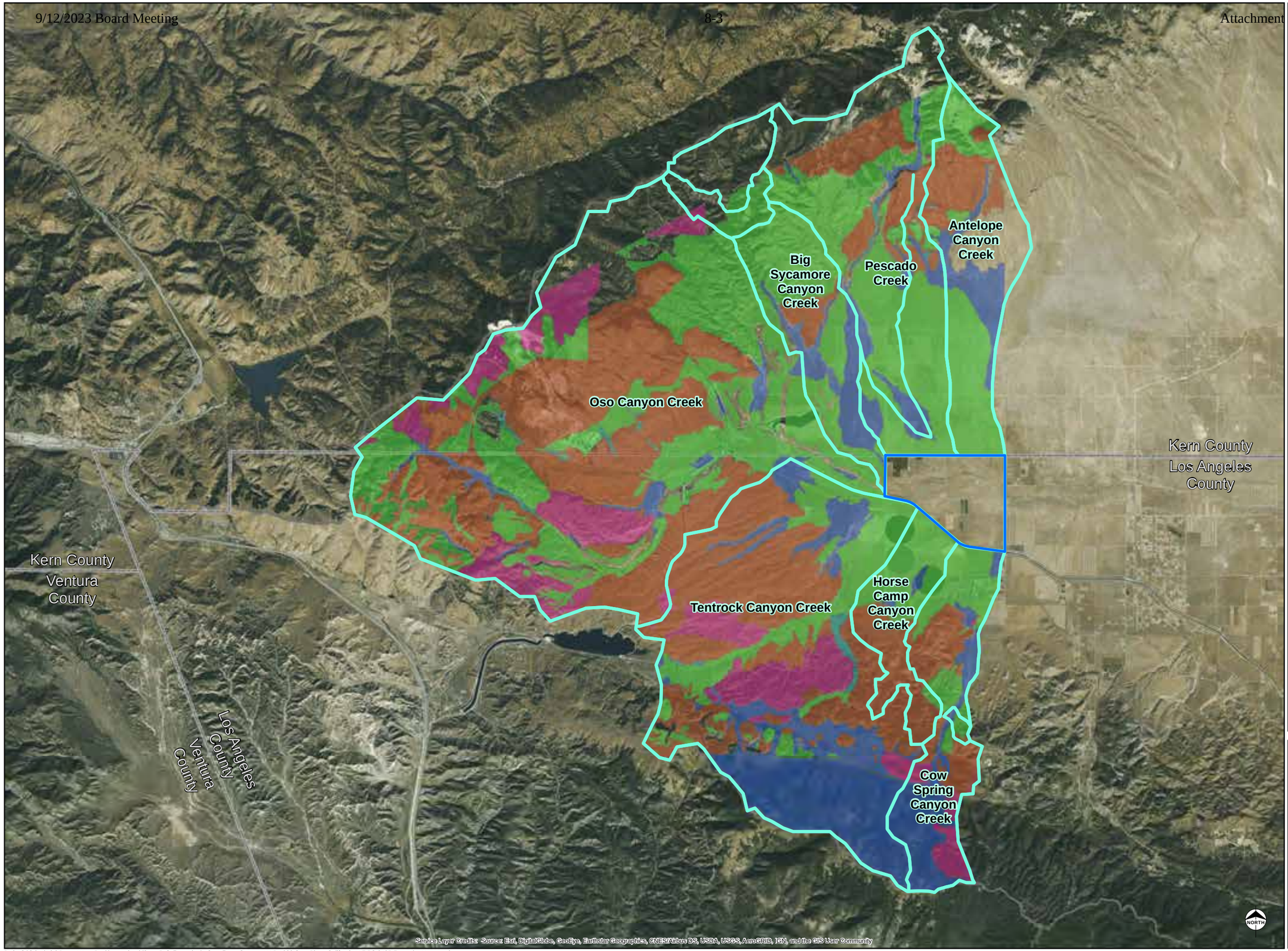
FEMA Flood Zones

Date: 5/11/2017 Project: 60537613.0002

AECOM

Figur

Path: G:\Other\HighDesertWaterBank\map_docs\Figure4_FEMA.mxd | Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet | User: jason.sokol



Legend

- Project Area
- Watershed Boundary
- County Boundaries

Soil Hydrologic Group

- A
- B
- C
- C/D
- D

Scale 1:96,000

1 inch = 8,000 feet

0 4,000 8,000 12,000
Feet

0 1,000 2,000 3,000
Meters

High Desert Water Bank
Antelope Valley - East Kern Water Agency

Soil Conditions

Date: 5/30/2017 Project: 60537613.0002

AECOM

Figur

Path: G:\Other\HighDesertWaterBank\map_docs\Figure5_Soils.mxd | Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet | User: paul.moreno

2.0 Hydrology

2.1 Time of Concentration Calculation

The unit hydrograph method uses time of concentration in the calculation of lag time, which is used to calibrate the synthetic hydrograph. The KCHM recommends the use of the Rational Method to estimate time of concentration.

To calculate time of concentration using the Rational Method, each watershed is divided into subareas and points of concentration. The initial time of concentration is determined using the nomograph in Figure D-1 from the KCHM (provided in Appendix A). Downstream points of concentration are spaced so that travel time is limited to less than the following (Section D.4.4 of the KCHM):

- Travel Time < 3 minutes for Time of Concentration < 30 minutes
- Travel Time < 5 minutes for Time of Concentration < 60 minutes
- Travel Time < 10 minutes for Time of Concentration ≥ 1 hour

2.2 Runoff Coefficient

Direct runoff from the watersheds is inversely proportional to the infiltration rate for pervious areas (Fp) which is calculated using Figure C-5 from the KCHM (provided in Appendix A). The value Fp is based on the Soil-Complex Curve Number (CN), which is a function of both hydrologic soil group designation and vegetation. CN values for each point of concentration is calculated as part of the Rational Method in Appendix A. The weighted average of these CN values used in the Unit Hydrograph Method is shown in **Table 2**.

2.3 Rainfall Intensity

To calculate time of concentration using the Rational Method, rainfall intensity is estimated across the study area. Rainfall intensity is derived using National Oceanic and Atmospheric Administration (NOAA) Atlas 14 point precipitation frequency estimates. The precipitation data sheets from http://hdsc.nws.noaa.gov/hdsc/pfds/ are included in Appendix A.

Because precipitation intensity varies with elevation, each watershed was divided into thirds; lower, middle, upper. A different intensity-duration-frequency (IDF) curve is provided for each zone. The southern watersheds (Cow Spring Canyon, Tentrock Canyon, and Horse Camp Canyon) on the San Gabriel Mountains utilize the same set of three IDF curves. The northern watersheds (Oso Canyon, Big Sycamore Canyon, Pescado, and Antelope) on the Tehachapi Mountains utilize a different set of IDF curves.

The Rational Method uses the middle IDF curve to calculate time of concentration. The Unit Hydrograph uses all zones as shown in **Table 2**.

2.4 Channel Velocity

The velocity of runoff in channels between points of concentration was determined using Manning's equation for open channel flow. A trapezoidal cross-section was assumed for each section of channel. Dimensions were estimated based on data from the USGS maps and GoogleEarth observations.

The Manning's roughness coefficient for natural channels was assumed to be between 0.160 and 0.035 so that the flow velocity was less than critical. Natural channels in alluvium do not experience supercritical flow.

2.5 Rational Method Analysis

Using the channel velocity data, rainfall intensity, and runoff coefficients, the time of concentration was estimated using the Rational Method per Section "D" of the KCHM. Flow path length and elevations were determined using USGS 7.5 minute quadrangle topographic maps. Confluence calculations were not performed, as the determination of flow rates at intermediate points was not relevant to this investigation. Detailed calculations are provided in Appendix A. The results of the Rational Method analysis are shown in Table 1.

Table 1. Estimated time of concentration for watersheds using the Rational Method.

Watershed	Area (acre)	Flowpath (ft)	Change in Elevation (ft)	T_c (min)
Cow Springs Canyon Creek	3,619	35,501	2,615	103
Tentrock Canyon Creek	5,809	49,824	2,575	144
Horsecamp Canyon Creek	1,983	23,123	936	90
Oso Canyon Creek	21,710	67,502	2,163	169
Big Sycamore Canyon Creek	4,751	36,682	1,795	127
Pescado Creek	7,927	45,530	3,035	132
Antelope Canyon Creek	4,267	35,017	1,845	110

2.6 Unit Hydrograph Calculation

Unit Hydrograph Method calculations were performed using the software "CivilDesign" by Joseph Bonadiman. Individual Unit Hydrograph analyses were performed for each watershed. **Table 2** contains input data used with CivilDesign software. The latitude for the northern watersheds is 34.75 degrees and the latitude for the southern watersheds is 34.80 degrees. A complete set of Unit Hydrograph results is provided in Appendix A.

Table 2. Unit Hydrograph Input

Watershed	Area (acres)	Tc (hours)	Area (acres)	Rainfall Data (inches)				CN
				2-yr, 6-hr	2-yr, 24-hr	100-yr, 6-hr	100-yr, 24-hr	
Cow Spring Canyon Creek	3,717	1.713	714	2.1	3.8	5.0	9.6	77
			1,326	1.6	3.0	3.9	7.4	64
			1,677	1.1	2.1	2.7	5.2	84
Tentrock Canyon Creek	5,814	2.393	1,156	2.1	3.8	5.0	9.6	72
			4,150	1.6	3.0	3.9	7.4	58
			508	1.1	2.1	2.7	5.2	85
Horse Camp Canyon Creek	1,871	1.502	408	1.6	3.0	3.9	7.4	66
			1,463	1.1	2.1	2.7	5.2	85
Oso Canyon Creek	21,730	2.811	2,891	1.3	2.5	3.4	6.5	64
			13,216	1.3	2.5	3.2	6.3	75
			5,623	1.2	2.2	2.7	5.6	83
Big Sycamore Canyon Creek	4,750	2.121	1,640	1.5	2.8	3.7	7.1	72
			901	1.3	2.5	3.2	6.2	70
			2,208	1.1	2.0	2.5	5.0	76
Pescado Creek	7,948	2.199	2,179	1.5	2.8	3.7	7.1	55
			2,307	1.3	2.5	3.2	6.2	79
			3,462	1.1	2.0	2.5	5.0	79
Antelope Canyon Creek	4,289	1.837	1,155	1.5	2.8	3.7	7.1	65
			1,854	1.3	2.5	3.2	6.2	75
			1,281	1.1	2.0	2.5	5.0	79

The results from the unit hydrograph analyses are provided in **Table 3**.

Table 3. Unit Hydrograph Results

Watershed	Peak Flow (CFS)
Antelope Canyon Creek	3,331
Pescado Creek	4,717
Big Sycamore Canyon Creek	3,126
Oso Canyon Creek	10,753
Horsecamp Canyon Creek	1,775
Tentrock Canyon Creek	4,576
Cow Springs Canyon Creek	3,500

3.0 Flood Depth Determination

The confluence of the seven (7) streams previously described occurs within the project site. The following is a summary of how these streams enter the project site (see **Figure 6**).

- **Antelope Canyon Creek** and **Pescado Creek** flow overland to the north boundary of the project site. Historically these were braided streams that meandered along the existing alluvial fans. Though agricultural production has obscured these stream channels, they would naturally reestablish during a major storm event.
- **Big Sycamore Canyon Creek** and **Oso Canyon Creek** flow in well-defined channels and enter the project site at the west boundary. Big Sycamore Canyon Creek is unconfined and flows as a braided stream on the alluvial fan. Oso Canyon Creek is concentrated at two crossings of the California Aqueduct and is restricted from meandering.
- **Horsecamp Canyon Creek** and **Tentrock Canyon Creek** are both diverted by the California Aqueduct, which has aboveground berms to protect it from overland flow. Both streams are diverted to a large flume over the aqueduct near 290th Street West. For the purposes of this report, this flume is referred to as "Flume 1". This flume is assumed to be 5-feet high with a longitudinal slope of 0.7% and a roughness coefficient of n=0.15.
- **Cow Springs Canyon Creek** is also diverted by the California Aqueduct and conveyed to a smaller flume approximately 0.5 miles west of 280th Street West. For the purposes of this report, this flume is referred to as "Flume 2". This flume is assumed to be 5-feet high with a longitudinal slope of 1% and a roughness coefficient of n=0.013.

Flow for each creek is assumed to be a braided stream; wide and relatively shallow with a rectangular flow area. Flow depth can be calculated using the following relationship[2].

$$d = Q/(vw)$$

d = Depth of Flow (feet)
Q = Flow Rate (cfs)
v = Fluid Velocity (fps)
w = Width of Flow (feet)

Width of flow is estimated from aerial imagery from GoogleEarth where the stream enters the project site. In the case of Antelope Canyon Creek and Pescado Creek widths were obtained from the upper reaches of the alluvial fan, where defined channels are currently observable.

[2] This is based upon the definition of flow; flow = velocity x cross-sectional area (Q = v*A).

Fluid velocity is estimated using Manning's Equation for open channel flow as summarized below.

$$v = \frac{1.49}{n} {R_h}^{2/3} s^{1/2}$$

v = Fluid Velocity (fps)
n = Roughness Coefficient
R_h = Hydraulic Radius (feet) = flow area / wetted perimeter
s = Longitudinal Slope (feet/feet)

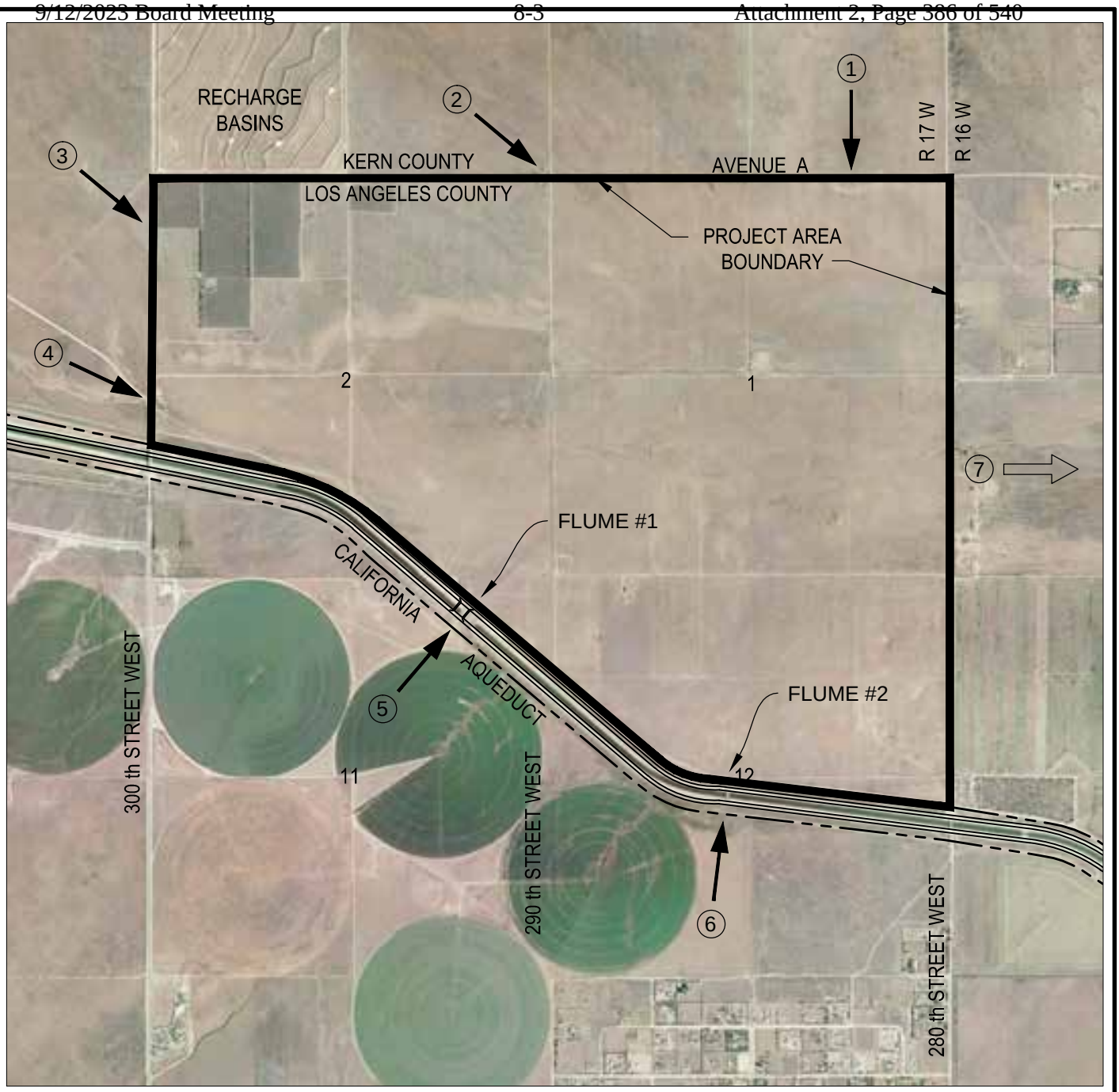
Flow depth estimates are summarized in **Table 4**.

Table 4. Flood Depth Estimate for 100-year, 24-hour Peak Flow

Watershed	Flow (cfs)	Velocity (fps)	Width (ft)	Depth (ft)	Flow Area (sf)	Wetted Perimeter (ft)	Slope (ft/ft)	n
Antelope Canyon Creek	3,331	2	1,500	1.3	2,008	1,506	0.019	0.150
Pescado Creek	4,717	2	1,500	1.9	2,842	1,508	0.012	0.150
Big Sycamore Canyon Creek	3,126	2	800	2.2	1,731	810	0.012	0.150
Oso Canyon Creek	10,753	3	550	6.9	3,917	581	0.006	0.150
Horsecamp Canyon Creek & Tentrock Canyon Creek	6,351	7	200	4.6	957	220	0.007	0.050
Cow Springs Canyon Creek[3]	3,500	24	30	3.8	145	47	0.010	0.013
Outflow (Combined Total)	31,778	2	3,400	4.7	16,106	3,421	0.005	0.150

Outflow is calculated as the sum of all the creeks simultaneously at peak flow. This scenario is conservative as it represents the maximum amount of water flowing into the site during a worst-case storm event. The likelihood of this actually occurring, however, is very remote. Storms typically result in peak flow from one or two watersheds at a time, but rarely all of them simultaneously.

[3] Velocity estimate is for the concrete flume crossing over the California Aqueduct. Supercritical velocities would dissipate immediately after existing the flume.



N

1" = 2000'

	Watershed	Flow (cfs)	Depth (ft)
1	Antelope Canyon Creek	3,331	1.3
2	Pescado Creek	4,717	1.9
3	Big Sycamore Canyon Creek	3,126	2.2
4	Oso Canyon Creek	10,753	6.9
5	Horsecamp Canyon Creek & Tentrock Canyon Creek	6,351	4.6
6	Cow Springs Canyon Creek	3,500	3.8
7	Outflow (Combined Total)	31,778	4.7

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Filename: S:\A01\60537613 - ENTERPRISE WATERBANK CEQA\900 WORKINGDOCS-CAD\03-SKETCHES\60537613-FIG-6.DWG

Project Management Initials: Designer: Checked: Approved: ANSI A 8.5" x 11"

ANTELOPE VALLEY-EAST KERN WATER AGENCY
HIGH DESERT WATER BANK
FLOOD FLOW DEPTH
60537613

AECOM

Figure: 6

4.0 Evaluation of Potential Impacts

4.1 Drainage Patterns

The project will preserve existing topography and not significantly alter existing drainage patterns. The intent is for runoff to continue entering and exiting the project site in the future at the same locations they do now. Low earthen berms, no more than 3 feet above existing grade, are proposed to be constructed throughout the project site. The intent of these berms is to retain SWP water to facilitate groundwater recharge. These berms will also retain and recharge low flow storm runoff. During high flow events the berms are intended to be sacrificial. Once retained flow volume exceeds the top of the berm and runoff will continue in its historic direction. The berms will dissipate energy and should reduce erosion and siltation downstream.

Facilities will be constructed as part of the project, including wells, pumps stations, and storage tanks. Those facilities will be located in the upland areas and are not intended to divert flow.

4.2 Flood Hazards

The project does not include construction of any structures (tanks and pressure vessels are not considered structures). Thus no structures will be placed within the 100-year flood hazard area. Because drainage patterns will not change as a result of the project, changes to 100-year flood hazard area are unlikely. There are approximately seven (7) homes located downstream of the project site and the unincorporated community of Nennach is located approximately 2 miles to the east of the project.

4.3 Seiche, Tsunami, & Mudflow

This section evaluates the potential for the project to be inundated natural phenomena and if the project increases the chance of other properties being inundated. These phenomena are grouped into three categories; seiche, tsunamis, and mudflow.

A seiche is a large wave generated in an enclosed body of water (i.e. lake), often caused by ground-shaking associated with seismic activity. The closest body of water is Quail Lake, located approximately 6.5 miles to the southeast. Because the lake is small (approximately 200 acres) and located far away from the project, there is no risk of inundation by a seiche.

Tsunamis are large ocean waves generated by fault displacement or major ground movement. Given the project area's distance from the Pacific coast (over 50 miles) and the project site elevation (approximately 3,000 feet above sea level), there is no risk of inundation.

A mudflow or mudslide is flow comprised of earth, rocks, and large amounts of water that travels down a slope at high velocity. The project site is located on relatively flat ground approximately 2 miles north of the San Gabriel Mountains and 4 miles south of the Tehachapi Mountains. Because of the distance to steep slopes the potential for mudflow is very unlikely.

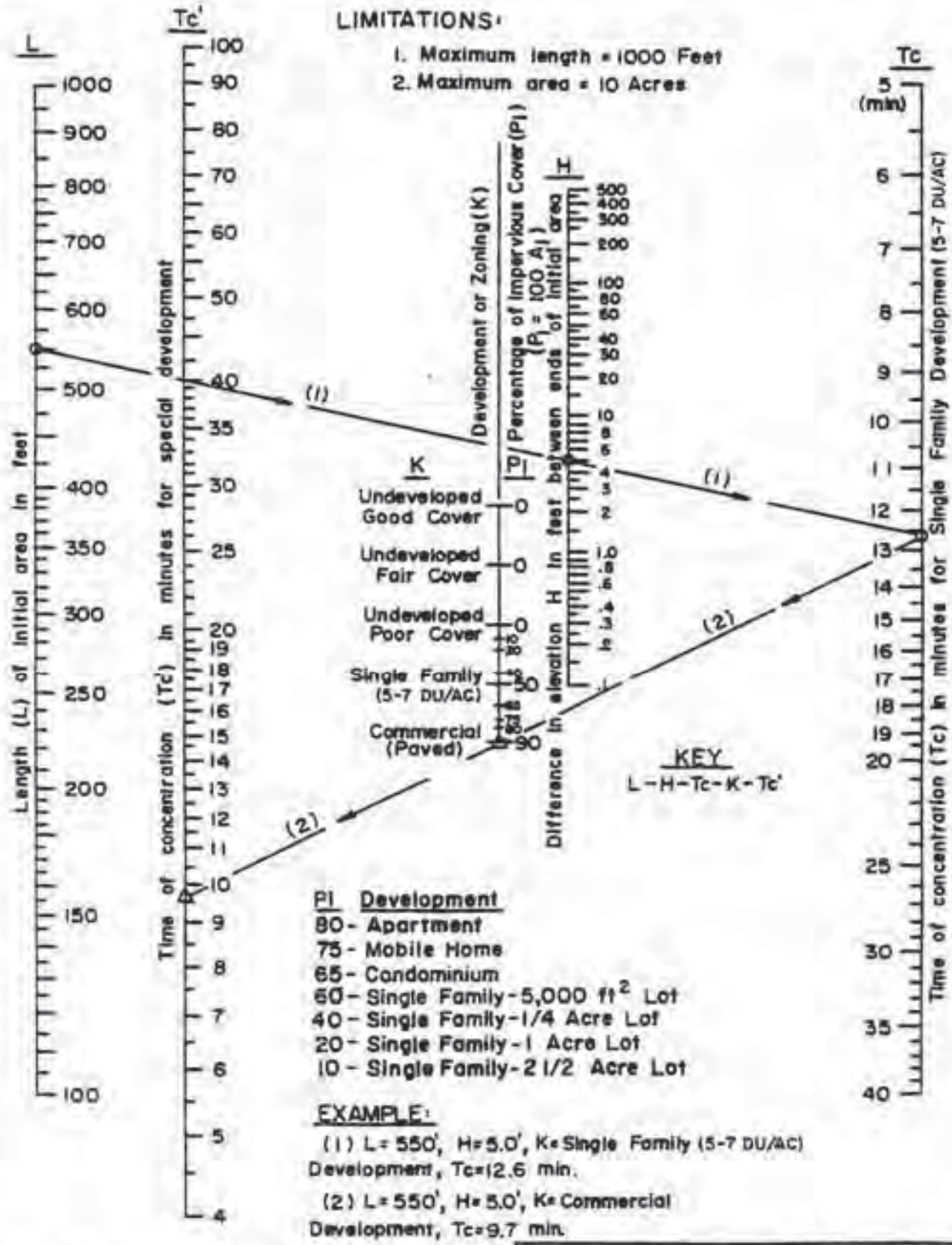
5.0 Conclusions

This section summarizes key conclusions based on the hydrologic and hydraulic analyses performed for the site and documented in this report. The project will not:

a. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site.
b. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.
c. 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.
d. Will not otherwise substantially degrade water quality. No potential water quality impacts other than those described above in this section are anticipated
e. Will not place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.
f. Will not place within a 100-year flood hazard area, structures which would impede or redirect flood flows.
g. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.
h. Will not cause inundation by seiche, tsunami, or mudflow.

Appendix "A"

Hydrologic & Hydraulic Calculations



KERN COUNTY
HYDROLOGY MANUAL

TIME OF CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA

Figure D-1

Curve[1] Numbers of Hydrologic Soil-Cover Complexes For Pervious Areas-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
NATURAL COVERS -					
Barren (Rockland, eroded and graded land)		77	86	91	94
Chaparral, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparral, Narrowleaf (Chamise and Redskank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadows or Cienagas (Areas with seasonally high water table, principal vegatation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	71	78
Open Brush (Soft wood shrubs-buckwheat,sage,etc.)	Poor	62	76	84	88
	Fair	46	66	77	83
	Good	41	63	75	81
Woodland (4) (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
URBAN COVERS -					
Residential or Commercial Landscaping (Lawns, shrubs, etc.)	Good	39	61	74	80
Turf (Irrigated and mowed grass)	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80

KERN COUNTY
Hydrology Manual

CURVE NUMBERS FOR PERVIOUS AREAS

FIGURE C-2 (1 of 2)

Curve[1] Numbers of Hydrologic Soil-Cover Complexes For Pervious Areas-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
AGRICULTURAL COVERS -					
Fallow (Bare Soil)		77	86	91	94
Close Seeded (alfalfa, sweetclover, timothy, etc.)	Poor	66	77	85	89
	Good	58	72	81	85
Orchards, Evergreen (Citrus, avacodos, etc.)	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Pasture (Grassland or range, continuos forage for grazing)	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Row Crops (Straight row, non-contoured)	Poor	72	81	88	91
	Good	67	78	85	89
Small Grain (Straight row, non-contoured)	Poor	65	76	84	88
	Good	63	75	83	87

Notes:

1. Average runoff condition, Ia = 0.2(S)

2. Poor: Heavily grazed, regularly burned areas, or areas of high burn potential. Less than 50 percent of the ground surface is protected by plant cover or brush and tree canopy.

   Fair: Moderate cover with 50 percent to 75 percent of the ground surface protected. In wooded areas the woods are grazed but not burned, and some forest litter covers the soil.

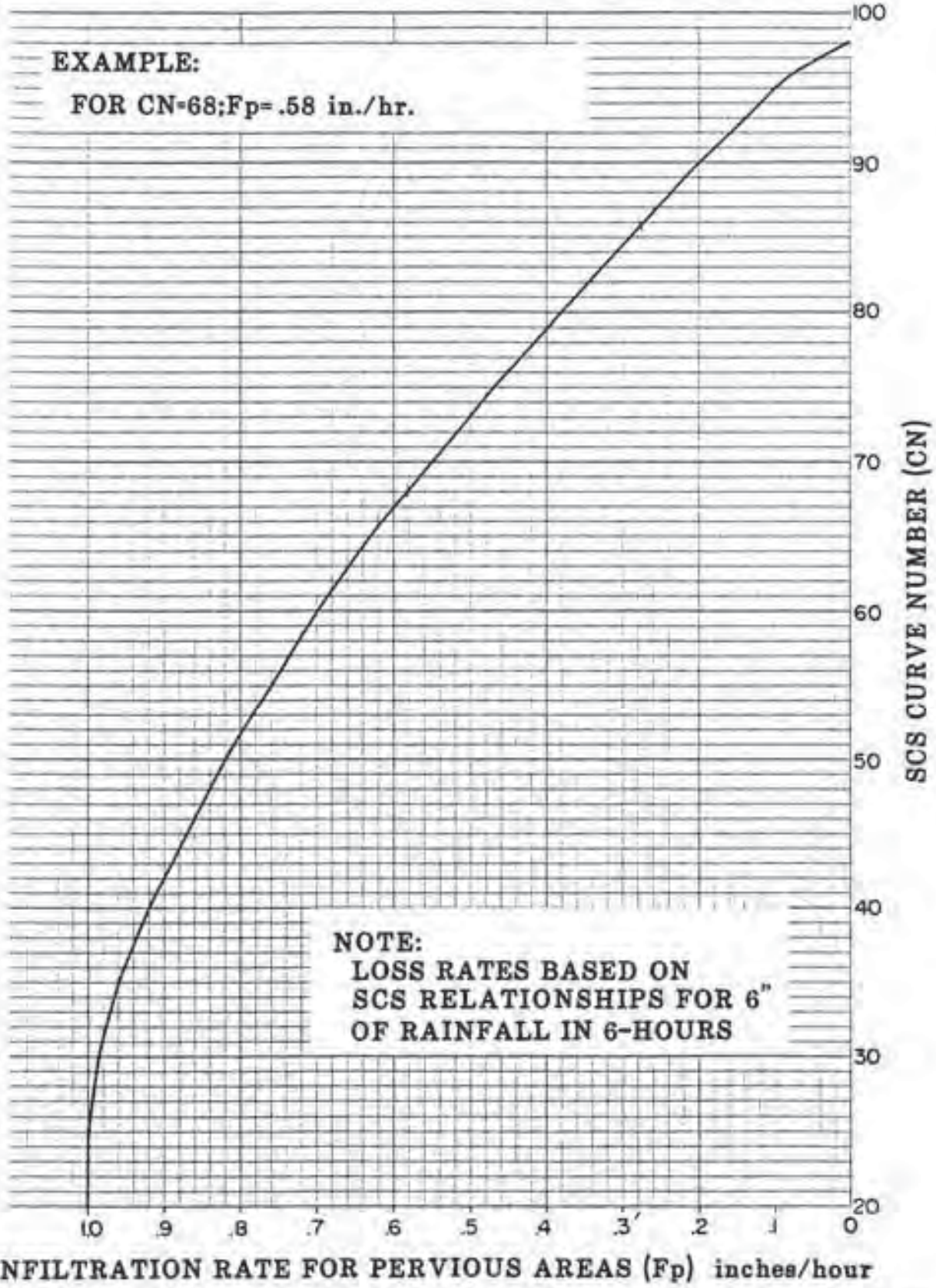
   Good: Heavy or dense cover with more than 75 percent of the ground surface protected. In wooded areas the woods are protected from grazing, litter and brush adequately cover soil.

3. See Figure C-1 for definition of cover types.

KERN COUNTY
Hydrology Manual

CURVE NUMBERS FOR PERVIOUS AREAS

FIGURE C-2 (2 of 2)



KERN COUNTY
Hydrology Manual

INFILTRATION RATE FOR PERVIOUS AREAS VERSUS SCS CURVE NUMBERS

FIGURE C-5

Lower Third Watersheds
- Cow Springs Canyon
- Horse Camp Canyon
- Tentrock Canyon

NOAA Atlas 14, Volume 6, Version 2
Location name: Lancaster, California, USA*
Latitude: 34.7883°, Longitude: -118.6335°
Elevation: 3006.51 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.080 (0.066-0.097)	0.103 (0.085-0.125)	0.135 (0.112-0.165)	0.164 (0.134-0.202)	0.206 (0.163-0.262)	0.241 (0.186-0.314)	0.279 (0.210-0.373)	0.320 (0.235-0.441)	0.381 (0.268-0.547)	0.431 (0.293-0.642)
10-min	0.115 (0.095-0.140)	0.147 (0.122-0.180)	0.194 (0.160-0.237)	0.234 (0.192-0.289)	0.295 (0.233-0.376)	0.345 (0.267-0.450)	0.399 (0.301-0.534)	0.459 (0.337-0.632)	0.546 (0.384-0.784)	0.618 (0.419-0.920)
15-min	0.139 (0.115-0.169)	0.178 (0.147-0.217)	0.234 (0.194-0.287)	0.284 (0.232-0.350)	0.356 (0.282-0.455)	0.417 (0.323-0.544)	0.483 (0.364-0.646)	0.555 (0.407-0.764)	0.660 (0.464-0.949)	0.747 (0.507-1.11)
30-min	0.194 (0.161-0.236)	0.249 (0.207-0.304)	0.328 (0.271-0.402)	0.397 (0.325-0.490)	0.499 (0.395-0.637)	0.584 (0.452-0.762)	0.676 (0.511-0.905)	0.777 (0.570-1.07)	0.925 (0.650-1.33)	1.05 (0.710-1.56)
60-min	0.281 (0.233-0.343)	0.362 (0.299-0.441)	0.476 (0.393-0.583)	0.576 (0.471-0.710)	0.724 (0.572-0.924)	0.847 (0.655-1.10)	0.981 (0.740-1.31)	1.13 (0.827-1.55)	1.34 (0.942-1.93)	1.52 (1.03-2.26)
2-hr	0.428 (0.355-0.522)	0.560 (0.463-0.683)	0.737 (0.609-0.902)	0.885 (0.725-1.09)	1.09 (0.864-1.39)	1.25 (0.971-1.64)	1.42 (1.07-1.90)	1.60 (1.17-2.20)	1.84 (1.29-2.64)	2.02 (1.37-3.01)
3-hr	0.554 (0.459-0.675)	0.727 (0.602-0.887)	0.956 (0.789-1.17)	1.14 (0.936-1.41)	1.40 (1.11-1.79)	1.60 (1.24-2.09)	1.80 (1.36-2.41)	2.01 (1.47-2.76)	2.28 (1.60-3.28)	2.49 (1.69-3.71)
6-hr	0.840 (0.696-1.02)	1.11 (0.916-1.35)	1.45 (1.20-1.77)	1.73 (1.41-2.13)	2.10 (1.66-2.68)	2.38 (1.84-3.10)	2.66 (2.01-3.56)	2.94 (2.16-4.05)	3.32 (2.33-4.77)	3.60 (2.44-5.35)
12-hr	1.18 (0.978-1.44)	1.56 (1.30-1.91)	2.06 (1.70-2.52)	2.46 (2.02-3.04)	2.99 (2.37-3.82)	3.39 (2.63-4.43)	3.79 (2.86-5.08)	4.19 (3.08-5.78)	4.72 (3.32-6.78)	5.11 (3.47-7.62)
24-hr	1.56 (1.38-1.79)	2.10 (1.86-2.41)	2.79 (2.47-3.22)	3.35 (2.94-3.90)	4.10 (3.47-4.93)	4.66 (3.87-5.73)	5.22 (4.23-6.59)	5.79 (4.56-7.52)	6.55 (4.94-8.86)	7.12 (5.19-9.98)
2-day	1.89 (1.67-2.17)	2.59 (2.30-2.99)	3.52 (3.11-4.06)	4.26 (3.73-4.96)	5.26 (4.45-6.33)	6.01 (4.99-7.39)	6.77 (5.48-8.54)	7.54 (5.93-9.78)	8.56 (6.46-11.6)	9.33 (6.80-13.1)
3-day	2.11 (1.87-2.43)	2.95 (2.61-3.39)	4.04 (3.57-4.67)	4.93 (4.32-5.74)	6.12 (5.19-7.37)	7.03 (5.83-8.65)	7.95 (6.43-10.0)	8.88 (6.98-11.5)	10.1 (7.64-13.7)	11.1 (8.07-15.5)
4-day	2.21 (1.96-2.54)	3.11 (2.75-3.58)	4.30 (3.80-4.96)	5.26 (4.61-6.12)	6.56 (5.56-7.90)	7.55 (6.26-9.29)	8.56 (6.92-10.8)	9.58 (7.54-12.4)	11.0 (8.26-14.8)	12.0 (8.75-16.8)
7-day	2.50 (2.21-2.87)	3.53 (3.13-4.07)	4.91 (4.34-5.67)	6.04 (5.30-7.04)	7.58 (6.43-9.13)	8.76 (7.27-10.8)	9.96 (8.06-12.6)	11.2 (8.80-14.5)	12.8 (9.68-17.4)	14.1 (10.3-19.8)
10-day	2.67 (2.37-3.08)	3.80 (3.37-4.38)	5.31 (4.69-6.13)	6.55 (5.74-7.63)	8.26 (7.00-9.94)	9.57 (7.94-11.8)	10.9 (8.83-13.8)	12.3 (9.66-15.9)	14.2 (10.7-19.1)	15.6 (11.4-21.8)
20-day	2.99 (2.65-3.44)	4.32 (3.83-4.98)	6.14 (5.42-7.08)	7.65 (6.71-8.91)	9.77 (8.28-11.8)	11.4 (9.48-14.1)	13.1 (10.6-16.6)	14.9 (11.7-19.3)	17.3 (13.1-23.4)	19.2 (14.0-26.9)
30-day	3.41 (3.03-3.92)	4.96 (4.39-5.71)	7.09 (6.27-8.19)	8.90 (7.80-10.4)	11.5 (9.70-13.8)	13.5 (11.2-16.6)	15.5 (12.6-19.6)	17.7 (13.9-23.0)	20.7 (15.6-28.0)	23.0 (16.8-32.3)
45-day	4.01 (3.56-4.62)	5.83 (5.17-6.71)	8.36 (7.39-9.65)	10.5 (9.22-12.3)	13.6 (11.5-16.4)	16.1 (13.3-19.8)	18.7 (15.1-23.5)	21.4 (16.8-27.7)	25.1 (18.9-34.0)	28.0 (20.4-39.3)
60-day	4.49 (3.98-5.16)	6.48 (5.74-7.46)	9.28 (8.20-10.7)	11.7 (10.2-13.6)	15.2 (12.8-18.3)	18.0 (14.9-22.1)	20.9 (16.9-26.4)	24.0 (18.9-31.1)	28.3 (21.3-38.3)	31.7 (23.1-44.3)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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Middle Third Watersheds
- Cow Springs Canyon
- Horse Camp Canyon
- Tentrock Canyon

NOAA Atlas 14, Volume 6, Version 2
Location name: Lake Hughes, California, USA*
Latitude: 34.7511°, Longitude: -118.628°
Elevation: 3829.5 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.113 (0.094-0.137)	0.146 (0.121-0.178)	0.192 (0.159-0.235)	0.232 (0.190-0.286)	0.289 (0.229-0.368)	0.335 (0.260-0.437)	0.386 (0.291-0.516)	0.440 (0.323-0.606)	0.521 (0.366-0.748)	0.588 (0.399-0.875)
10-min	0.162 (0.134-0.197)	0.210 (0.174-0.256)	0.276 (0.228-0.337)	0.332 (0.272-0.410)	0.414 (0.328-0.528)	0.481 (0.372-0.627)	0.553 (0.417-0.739)	0.631 (0.463-0.869)	0.746 (0.524-1.07)	0.842 (0.571-1.25)
15-min	0.196 (0.162-0.238)	0.254 (0.210-0.309)	0.333 (0.275-0.408)	0.402 (0.329-0.495)	0.501 (0.396-0.639)	0.581 (0.450-0.758)	0.668 (0.505-0.894)	0.764 (0.560-1.05)	0.902 (0.634-1.30)	1.02 (0.691-1.52)
30-min	0.276 (0.229-0.336)	0.358 (0.297-0.436)	0.470 (0.389-0.575)	0.567 (0.465-0.699)	0.706 (0.559-0.901)	0.821 (0.636-1.07)	0.943 (0.712-1.26)	1.08 (0.791-1.48)	1.27 (0.895-1.83)	1.44 (0.975-2.14)
60-min	0.407 (0.338-0.496)	0.527 (0.437-0.643)	0.693 (0.573-0.848)	0.836 (0.685-1.03)	1.04 (0.824-1.33)	1.21 (0.937-1.58)	1.39 (1.05-1.86)	1.59 (1.17-2.19)	1.88 (1.32-2.70)	2.12 (1.44-3.15)
2-hr	0.618 (0.512-0.752)	0.811 (0.672-0.989)	1.07 (0.883-1.31)	1.28 (1.05-1.58)	1.58 (1.25-2.01)	1.81 (1.40-2.36)	2.05 (1.55-2.74)	2.30 (1.69-3.17)	2.65 (1.86-3.81)	2.93 (1.99-4.36)
3-hr	0.796 (0.661-0.969)	1.05 (0.869-1.28)	1.38 (1.14-1.69)	1.65 (1.35-2.04)	2.02 (1.60-2.58)	2.30 (1.78-3.00)	2.60 (1.96-3.47)	2.90 (2.12-3.99)	3.31 (2.32-4.75)	3.63 (2.46-5.40)
6-hr	1.20 (0.997-1.46)	1.58 (1.31-1.93)	2.08 (1.72-2.55)	2.48 (2.04-3.06)	3.02 (2.39-3.86)	3.43 (2.66-4.48)	3.85 (2.90-5.14)	4.27 (3.13-5.87)	4.83 (3.40-6.95)	5.27 (3.58-7.85)
12-hr	1.68 (1.40-2.05)	2.23 (1.85-2.72)	2.93 (2.42-3.58)	3.50 (2.87-4.31)	4.26 (3.37-5.43)	4.84 (3.75-6.31)	5.42 (4.09-7.24)	6.01 (4.41-8.27)	6.80 (4.78-9.77)	7.41 (5.03-11.0)
24-hr	2.23 (1.98-2.57)	2.98 (2.64-3.43)	3.95 (3.49-4.57)	4.74 (4.15-5.52)	5.80 (4.91-6.98)	6.61 (5.48-8.13)	7.42 (6.00-9.36)	8.25 (6.49-10.7)	9.37 (7.07-12.7)	10.2 (7.46-14.3)
2-day	2.77 (2.45-3.18)	3.77 (3.34-4.33)	5.07 (4.48-5.85)	6.13 (5.37-7.13)	7.56 (6.41-9.10)	8.66 (7.18-10.6)	9.77 (7.91-12.3)	10.9 (8.58-14.2)	12.5 (9.39-16.8)	13.7 (9.94-19.1)
3-day	3.07 (2.73-3.54)	4.24 (3.76-4.88)	5.76 (5.09-6.66)	7.01 (6.14-8.16)	8.70 (7.37-10.5)	10.0 (8.29-12.3)	11.3 (9.16-14.3)	12.7 (9.98-16.5)	14.5 (11.0-19.7)	16.0 (11.6-22.4)
4-day	3.31 (2.94-3.81)	4.60 (4.08-5.30)	6.29 (5.56-7.26)	7.67 (6.72-8.93)	9.55 (8.09-11.5)	11.0 (9.13-13.5)	12.5 (10.1-15.7)	14.0 (11.0-18.2)	16.1 (12.1-21.8)	17.7 (12.9-24.8)
7-day	3.75 (3.33-4.32)	5.23 (4.63-6.02)	7.17 (6.33-8.28)	8.76 (7.68-10.2)	10.9 (9.27-13.2)	12.6 (10.5-15.5)	14.4 (11.6-18.1)	16.2 (12.7-21.0)	18.6 (14.0-25.2)	20.5 (15.0-28.8)
10-day	4.04 (3.58-4.64)	5.63 (4.99-6.48)	7.74 (6.84-8.94)	9.47 (8.30-11.0)	11.9 (10.0-14.3)	13.7 (11.4-16.9)	15.6 (12.6-19.7)	17.6 (13.8-22.8)	20.3 (15.3-27.5)	22.4 (16.3-31.4)
20-day	4.70 (4.17-5.40)	6.60 (5.84-7.60)	9.13 (8.06-10.5)	11.2 (9.84-13.1)	14.1 (12.0-17.0)	16.4 (13.6-20.2)	18.8 (15.2-23.7)	21.3 (16.7-27.6)	24.7 (18.6-33.4)	27.4 (20.0-38.4)
30-day	5.51 (4.89-6.33)	7.74 (6.86-8.91)	10.7 (9.48-12.4)	13.2 (11.6-15.4)	16.7 (14.1-20.1)	19.4 (16.1-23.9)	22.3 (18.0-28.1)	25.3 (19.9-32.8)	29.5 (22.3-39.9)	32.9 (24.0-46.1)
45-day	6.50 (5.77-7.48)	9.08 (8.05-10.5)	12.6 (11.1-14.5)	15.5 (13.6-18.0)	19.6 (16.6-23.6)	22.8 (18.9-28.1)	26.3 (21.2-33.1)	29.9 (23.5-38.8)	35.0 (26.4-47.3)	39.1 (28.5-54.8)
60-day	7.34 (6.52-8.45)	10.2 (8.99-11.7)	14.0 (12.3-16.1)	17.2 (15.0-20.0)	21.7 (18.4-26.1)	25.3 (21.0-31.1)	29.1 (23.6-36.7)	33.2 (26.1-43.0)	38.9 (29.4-52.7)	43.6 (31.8-61.1)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

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Upper Third Watersheds
- Cow Springs Canyon
- Horse Camp Canyon
- Tentrock Canyon

NOAA Atlas 14, Volume 6, Version 2
Location name: Lake Hughes, California, USA*
Latitude: 34.7173°, Longitude: -118.6294°
Elevation: 5246.95 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.148 (0.123-0.180)	0.191 (0.158-0.233)	0.249 (0.206-0.304)	0.298 (0.244-0.367)	0.366 (0.290-0.467)	0.421 (0.326-0.548)	0.478 (0.361-0.639)	0.540 (0.396-0.743)	0.629 (0.442-0.904)	0.703 (0.477-1.05)
10-min	0.212 (0.176-0.257)	0.274 (0.227-0.334)	0.357 (0.295-0.436)	0.427 (0.350-0.526)	0.525 (0.416-0.669)	0.603 (0.467-0.786)	0.685 (0.518-0.916)	0.774 (0.568-1.07)	0.902 (0.634-1.30)	1.01 (0.684-1.50)
15-min	0.256 (0.212-0.311)	0.331 (0.275-0.404)	0.432 (0.357-0.528)	0.516 (0.423-0.636)	0.635 (0.503-0.810)	0.729 (0.565-0.951)	0.829 (0.626-1.11)	0.936 (0.687-1.29)	1.09 (0.767-1.57)	1.22 (0.827-1.81)
30-min	0.363 (0.301-0.442)	0.470 (0.389-0.572)	0.612 (0.506-0.748)	0.732 (0.600-0.903)	0.900 (0.713-1.15)	1.03 (0.802-1.35)	1.18 (0.888-1.57)	1.33 (0.975-1.83)	1.55 (1.09-2.22)	1.73 (1.17-2.57)
60-min	0.539 (0.448-0.656)	0.698 (0.579-0.851)	0.910 (0.752-1.11)	1.09 (0.892-1.34)	1.34 (1.06-1.71)	1.54 (1.19-2.00)	1.75 (1.32-2.34)	1.97 (1.45-2.72)	2.30 (1.62-3.30)	2.57 (1.74-3.83)
2-hr	0.813 (0.675-0.990)	1.07 (0.883-1.30)	1.40 (1.16-1.71)	1.67 (1.37-2.06)	2.04 (1.62-2.60)	2.33 (1.80-3.04)	2.63 (1.98-3.51)	2.94 (2.16-4.04)	3.37 (2.37-4.85)	3.72 (2.52-5.54)
3-hr	1.04 (0.864-1.27)	1.37 (1.13-1.67)	1.79 (1.48-2.19)	2.14 (1.75-2.64)	2.61 (2.07-3.33)	2.97 (2.30-3.87)	3.34 (2.52-4.46)	3.72 (2.73-5.12)	4.25 (2.99-6.10)	4.67 (3.17-6.95)
6-hr	1.56 (1.29-1.90)	2.05 (1.70-2.50)	2.69 (2.22-3.29)	3.21 (2.63-3.95)	3.90 (3.09-4.97)	4.43 (3.43-5.78)	4.97 (3.75-6.64)	5.52 (4.05-7.60)	6.27 (4.41-9.00)	6.85 (4.65-10.2)
12-hr	2.16 (1.80-2.63)	2.86 (2.37-3.48)	3.76 (3.11-4.60)	4.49 (3.68-5.54)	5.47 (4.33-6.98)	6.22 (4.82-8.11)	6.98 (5.27-9.33)	7.75 (5.69-10.7)	8.81 (6.19-12.7)	9.62 (6.53-14.3)
24-hr	2.87 (2.55-3.30)	3.83 (3.39-4.41)	5.07 (4.48-5.86)	6.08 (5.33-7.09)	7.45 (6.31-8.98)	8.50 (7.05-10.5)	9.56 (7.74-12.1)	10.7 (8.38-13.8)	12.1 (9.15-16.4)	13.3 (9.68-18.6)
2-day	3.61 (3.20-4.15)	4.89 (4.33-5.63)	6.55 (5.79-7.57)	7.91 (6.93-9.21)	9.75 (8.26-11.7)	11.2 (9.26-13.7)	12.6 (10.2-15.9)	14.1 (11.1-18.3)	16.1 (12.2-21.8)	17.7 (12.9-24.8)
3-day	4.00 (3.55-4.60)	5.47 (4.85-6.31)	7.40 (6.54-8.54)	8.97 (7.86-10.4)	11.1 (9.42-13.4)	12.8 (10.6-15.7)	14.5 (11.7-18.2)	16.2 (12.7-21.0)	18.6 (14.0-25.1)	20.4 (14.9-28.6)
4-day	4.40 (3.90-5.06)	6.05 (5.36-6.97)	8.21 (7.26-9.49)	9.98 (8.75-11.6)	12.4 (10.5-14.9)	14.3 (11.8-17.6)	16.2 (13.1-20.4)	18.2 (14.3-23.6)	20.9 (15.7-28.2)	23.0 (16.8-32.2)
7-day	4.99 (4.43-5.74)	6.88 (6.10-7.92)	9.36 (8.27-10.8)	11.4 (9.98-13.3)	14.2 (12.0-17.1)	16.3 (13.5-20.1)	18.6 (15.0-23.4)	20.9 (16.4-27.1)	24.0 (18.1-32.5)	26.5 (19.3-37.2)
10-day	5.38 (4.77-6.19)	7.42 (6.58-8.55)	10.1 (8.93-11.7)	12.3 (10.8-14.3)	15.3 (13.0-18.5)	17.7 (14.7-21.8)	20.1 (16.3-25.4)	22.7 (17.8-29.4)	26.1 (19.7-35.4)	28.9 (21.1-40.5)
20-day	6.39 (5.67-7.35)	8.84 (7.83-10.2)	12.1 (10.7-13.9)	14.8 (12.9-17.2)	18.4 (15.6-22.2)	21.3 (17.7-26.2)	24.3 (19.7-30.7)	27.5 (21.6-35.6)	31.9 (24.1-43.1)	35.4 (25.8-49.6)
30-day	7.59 (6.74-8.73)	10.5 (9.30-12.1)	14.3 (12.7-16.6)	17.5 (15.4-20.4)	21.9 (18.6-26.4)	25.4 (21.1-31.3)	29.0 (23.5-36.6)	32.9 (25.9-42.6)	38.3 (28.9-51.8)	42.6 (31.1-59.7)
45-day	8.97 (7.96-10.3)	12.3 (10.9-14.2)	16.7 (14.8-19.3)	20.4 (17.9-23.8)	25.6 (21.7-30.8)	29.6 (24.6-36.5)	33.9 (27.4-42.8)	38.5 (30.3-49.9)	44.9 (33.9-60.8)	50.2 (36.6-70.3)
60-day	10.2 (9.03-11.7)	13.8 (12.2-15.9)	18.6 (16.5-21.5)	22.7 (19.9-26.4)	28.3 (24.0-34.1)	32.8 (27.2-40.3)	37.5 (30.3-47.3)	42.6 (33.5-55.2)	49.8 (37.6-67.4)	55.8 (40.6-78.1)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

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NOAA Atlas 14, Volume 6, Version 2
Location name: Rosamond, California, USA*
Latitude: 34.816°, Longitude: -118.6994°
Elevation: 3061.32 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.084 (0.070-0.103)	0.108 (0.089-0.131)	0.139 (0.115-0.170)	0.166 (0.136-0.205)	0.204 (0.161-0.260)	0.235 (0.182-0.306)	0.267 (0.201-0.357)	0.301 (0.221-0.415)	0.349 (0.246-0.502)	0.388 (0.263-0.578)
10-min	0.121 (0.100-0.147)	0.154 (0.128-0.188)	0.200 (0.165-0.244)	0.238 (0.195-0.293)	0.292 (0.231-0.373)	0.336 (0.260-0.439)	0.382 (0.289-0.512)	0.432 (0.317-0.594)	0.501 (0.352-0.720)	0.557 (0.377-0.829)
15-min	0.146 (0.121-0.178)	0.186 (0.154-0.227)	0.241 (0.199-0.295)	0.288 (0.236-0.355)	0.354 (0.280-0.451)	0.407 (0.315-0.530)	0.462 (0.349-0.619)	0.522 (0.383-0.719)	0.606 (0.426-0.871)	0.673 (0.457-1.00)
30-min	0.204 (0.169-0.248)	0.260 (0.215-0.317)	0.337 (0.278-0.412)	0.401 (0.329-0.495)	0.493 (0.390-0.630)	0.567 (0.439-0.740)	0.645 (0.487-0.863)	0.728 (0.534-1.00)	0.845 (0.594-1.22)	0.939 (0.637-1.40)
60-min	0.292 (0.242-0.356)	0.373 (0.309-0.455)	0.483 (0.399-0.591)	0.575 (0.471-0.710)	0.707 (0.559-0.903)	0.813 (0.629-1.06)	0.925 (0.698-1.24)	1.04 (0.766-1.44)	1.21 (0.851-1.74)	1.35 (0.913-2.00)
2-hr	0.444 (0.368-0.541)	0.576 (0.477-0.702)	0.750 (0.619-0.917)	0.892 (0.731-1.10)	1.09 (0.861-1.39)	1.24 (0.960-1.62)	1.39 (1.05-1.87)	1.55 (1.14-2.14)	1.77 (1.24-2.54)	1.93 (1.31-2.87)
3-hr	0.577 (0.478-0.703)	0.752 (0.623-0.917)	0.980 (0.809-1.20)	1.17 (0.954-1.44)	1.42 (1.12-1.81)	1.61 (1.24-2.10)	1.80 (1.36-2.41)	2.00 (1.47-2.75)	2.26 (1.59-3.24)	2.45 (1.66-3.65)
6-hr	0.882 (0.731-1.07)	1.16 (0.957-1.41)	1.51 (1.25-1.85)	1.79 (1.47-2.21)	2.17 (1.72-2.77)	2.46 (1.90-3.21)	2.74 (2.07-3.67)	3.03 (2.22-4.17)	3.41 (2.40-4.90)	3.69 (2.50-5.50)
12-hr	1.25 (1.04-1.52)	1.66 (1.37-2.02)	2.18 (1.80-2.67)	2.60 (2.13-3.21)	3.16 (2.50-4.04)	3.58 (2.77-4.68)	4.01 (3.02-5.36)	4.43 (3.25-6.11)	4.99 (3.51-7.18)	5.41 (3.67-8.06)
24-hr	1.66 (1.47-1.90)	2.22 (1.97-2.56)	2.96 (2.61-3.42)	3.55 (3.11-4.13)	4.34 (3.68-5.23)	4.95 (4.11-6.09)	5.55 (4.50-7.00)	6.17 (4.85-8.00)	6.99 (5.27-9.45)	7.60 (5.54-10.7)
2-day	2.02 (1.79-2.32)	2.75 (2.44-3.17)	3.71 (3.28-4.28)	4.48 (3.93-5.22)	5.52 (4.68-6.65)	6.31 (5.23-7.76)	7.10 (5.75-8.95)	7.90 (6.22-10.3)	8.97 (6.76-12.1)	9.78 (7.12-13.7)
3-day	2.24 (1.99-2.58)	3.09 (2.74-3.56)	4.21 (3.72-4.86)	5.11 (4.48-5.95)	6.32 (5.36-7.61)	7.24 (6.01-8.91)	8.17 (6.61-10.3)	9.12 (7.17-11.8)	10.4 (7.83-14.1)	11.4 (8.27-15.9)
4-day	2.38 (2.11-2.74)	3.31 (2.93-3.81)	4.53 (4.01-5.24)	5.53 (4.84-6.43)	6.87 (5.82-8.27)	7.89 (6.54-9.70)	8.92 (7.22-11.2)	9.97 (7.85-12.9)	11.4 (8.59-15.4)	12.5 (9.09-17.5)
7-day	2.68 (2.38-3.08)	3.75 (3.32-4.32)	5.17 (4.57-5.97)	6.34 (5.56-7.38)	7.93 (6.72-9.55)	9.15 (7.59-11.3)	10.4 (8.41-13.1)	11.7 (9.17-15.1)	13.4 (10.1-18.1)	14.7 (10.7-20.6)
10-day	2.83 (2.51-3.25)	3.98 (3.53-4.58)	5.52 (4.88-6.38)	6.79 (5.96-7.91)	8.54 (7.24-10.3)	9.89 (8.21-12.2)	11.3 (9.12-14.2)	12.7 (9.98-16.5)	14.6 (11.0-19.8)	16.1 (11.7-22.6)
20-day	3.20 (2.84-3.68)	4.58 (4.06-5.27)	6.46 (5.71-7.46)	8.03 (7.04-9.35)	10.2 (8.67-12.3)	12.0 (9.92-14.7)	13.7 (11.1-17.3)	15.6 (12.3-20.2)	18.1 (13.7-24.5)	20.1 (14.6-28.2)
30-day	3.68 (3.27-4.24)	5.29 (4.69-6.09)	7.52 (6.64-8.68)	9.40 (8.24-10.9)	12.1 (10.2-14.5)	14.2 (11.8-17.4)	16.3 (13.2-20.6)	18.6 (14.7-24.2)	21.8 (16.4-29.5)	24.3 (17.7-34.0)
45-day	4.34 (3.85-4.99)	6.23 (5.52-7.17)	8.86 (7.83-10.2)	11.1 (9.74-12.9)	14.3 (12.1-17.3)	16.9 (14.0-20.8)	19.6 (15.9-24.7)	22.4 (17.6-29.1)	26.4 (19.9-35.7)	29.5 (21.4-41.3)
60-day	4.89 (4.34-5.62)	6.96 (6.17-8.02)	9.88 (8.73-11.4)	12.4 (10.9-14.4)	16.0 (13.6-19.3)	18.9 (15.7-23.3)	22.0 (17.8-27.7)	25.2 (19.8-32.7)	29.7 (22.4-40.1)	33.2 (24.2-46.6)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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Middle Third Watersheds - Oso Canyon Creek

NOAA Atlas 14, Volume 6, Version 2
Location name: Lebec, California, USA*
Latitude: 34.812°, Longitude: -118.7475°
Elevation: 3553.16 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

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PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.094 (0.078-0.115)	0.123 (0.102-0.149)	0.160 (0.132-0.196)	0.191 (0.157-0.236)	0.235 (0.186-0.300)	0.269 (0.208-0.351)	0.305 (0.230-0.408)	0.343 (0.252-0.472)	0.396 (0.278-0.569)	0.438 (0.297-0.653)
10-min	0.135 (0.112-0.165)	0.176 (0.145-0.214)	0.229 (0.190-0.281)	0.274 (0.225-0.338)	0.337 (0.266-0.430)	0.386 (0.299-0.503)	0.437 (0.330-0.585)	0.492 (0.361-0.677)	0.568 (0.399-0.816)	0.628 (0.426-0.936)
15-min	0.164 (0.136-0.199)	0.212 (0.176-0.259)	0.277 (0.229-0.339)	0.331 (0.272-0.409)	0.407 (0.322-0.519)	0.467 (0.361-0.609)	0.529 (0.399-0.707)	0.594 (0.436-0.819)	0.686 (0.482-0.987)	0.760 (0.515-1.13)
30-min	0.228 (0.189-0.277)	0.296 (0.245-0.360)	0.386 (0.319-0.472)	0.461 (0.378-0.569)	0.566 (0.448-0.723)	0.650 (0.503-0.847)	0.736 (0.556-0.985)	0.828 (0.607-1.14)	0.955 (0.671-1.37)	1.06 (0.718-1.58)
60-min	0.328 (0.272-0.400)	0.426 (0.353-0.519)	0.557 (0.460-0.680)	0.665 (0.545-0.820)	0.816 (0.646-1.04)	0.936 (0.725-1.22)	1.06 (0.801-1.42)	1.19 (0.875-1.64)	1.38 (0.967-1.98)	1.52 (1.03-2.27)
2-hr	0.501 (0.416-0.611)	0.658 (0.545-0.802)	0.862 (0.712-1.05)	1.03 (0.842-1.27)	1.25 (0.992-1.60)	1.43 (1.10-1.86)	1.60 (1.21-2.14)	1.78 (1.31-2.45)	2.02 (1.42-2.91)	2.21 (1.50-3.29)
3-hr	0.652 (0.541-0.794)	0.857 (0.710-1.04)	1.12 (0.928-1.37)	1.34 (1.09-1.65)	1.63 (1.29-2.08)	1.84 (1.43-2.41)	2.06 (1.56-2.76)	2.29 (1.68-3.15)	2.59 (1.82-3.72)	2.82 (1.91-4.19)
6-hr	1.00 (0.830-1.22)	1.32 (1.09-1.61)	1.73 (1.43-2.12)	2.06 (1.69-2.54)	2.50 (1.98-3.19)	2.83 (2.19-3.69)	3.15 (2.38-4.22)	3.49 (2.56-4.80)	3.93 (2.76-5.65)	4.26 (2.89-6.34)
12-hr	1.42 (1.18-1.73)	1.89 (1.56-2.30)	2.49 (2.06-3.04)	2.97 (2.43-3.66)	3.62 (2.86-4.61)	4.10 (3.18-5.35)	4.59 (3.47-6.14)	5.09 (3.73-7.00)	5.74 (4.04-8.25)	6.24 (4.23-9.29)
24-hr	1.88 (1.67-2.16)	2.53 (2.24-2.91)	3.36 (2.97-3.88)	4.04 (3.54-4.70)	4.95 (4.19-5.96)	5.64 (4.68-6.94)	6.34 (5.13-7.99)	7.05 (5.55-9.15)	8.00 (6.04-10.8)	8.73 (6.36-12.2)
2-day	2.30 (2.04-2.65)	3.13 (2.78-3.61)	4.22 (3.73-4.88)	5.11 (4.48-5.95)	6.29 (5.33-7.58)	7.20 (5.97-8.86)	8.12 (6.57-10.2)	9.05 (7.12-11.7)	10.3 (7.77-13.9)	11.3 (8.20-15.8)
3-day	2.55 (2.26-2.93)	3.51 (3.11-4.04)	4.77 (4.22-5.51)	5.80 (5.08-6.75)	7.19 (6.09-8.65)	8.25 (6.84-10.1)	9.32 (7.54-11.8)	10.4 (8.20-13.5)	11.9 (8.98-16.1)	13.1 (9.51-18.3)
4-day	2.74 (2.43-3.15)	3.81 (3.37-4.38)	5.21 (4.60-6.01)	6.35 (5.56-7.39)	7.90 (6.69-9.51)	9.09 (7.54-11.2)	10.3 (8.33-13.0)	11.5 (9.08-15.0)	13.2 (9.97-17.9)	14.5 (10.6-20.4)
7-day	3.09 (2.74-3.55)	4.32 (3.83-4.97)	5.95 (5.26-6.87)	7.30 (6.39-8.49)	9.14 (7.74-11.0)	10.6 (8.76-13.0)	12.0 (9.72-15.1)	13.5 (10.6-17.5)	15.6 (11.7-21.1)	17.2 (12.5-24.1)
10-day	3.25 (2.89-3.74)	4.58 (4.05-5.27)	6.34 (5.60-7.32)	7.80 (6.83-9.08)	9.81 (8.31-11.8)	11.4 (9.44-14.0)	13.0 (10.5-16.4)	14.7 (11.5-19.0)	17.0 (12.8-22.9)	18.8 (13.7-26.3)
20-day	3.72 (3.30-4.28)	5.29 (4.69-6.10)	7.43 (6.57-8.58)	9.21 (8.08-10.7)	11.7 (9.93-14.1)	13.7 (11.4-16.8)	15.7 (12.7-19.9)	17.9 (14.1-23.2)	20.9 (15.8-28.3)	23.3 (16.9-32.6)
30-day	4.32 (3.83-4.97)	6.16 (5.46-7.10)	8.69 (7.68-10.0)	10.8 (9.48-12.6)	13.8 (11.7-16.6)	16.2 (13.5-20.0)	18.7 (15.2-23.6)	21.4 (16.8-27.7)	25.1 (18.9-33.9)	28.0 (20.4-39.3)
45-day	5.11 (4.53-5.87)	7.26 (6.43-8.35)	10.2 (9.03-11.8)	12.7 (11.2-14.8)	16.3 (13.8-19.7)	19.2 (15.9-23.6)	22.3 (18.0-28.1)	25.5 (20.0-33.1)	30.0 (22.7-40.6)	33.7 (24.5-47.2)
60-day	5.79 (5.13-6.65)	8.14 (7.21-9.37)	11.4 (10.1-13.2)	14.2 (12.4-16.5)	18.2 (15.4-21.9)	21.4 (17.8-26.4)	24.8 (20.1-31.3)	28.5 (22.4-37.0)	33.6 (25.4-45.5)	37.8 (27.5-53.0)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

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Upper Third Watersheds - Oso Canyon Creek

NOAA Atlas 14, Volume 6, Version 2
Location name: Lebec, California, USA*
Latitude: 34.8064°, Longitude: -118.8278°
Elevation: 4424.29 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.094 (0.078-0.115)	0.134 (0.111-0.163)	0.186 (0.154-0.227)	0.228 (0.187-0.281)	0.284 (0.225-0.363)	0.328 (0.254-0.427)	0.372 (0.281-0.497)	0.417 (0.306-0.574)	0.477 (0.335-0.686)	0.525 (0.356-0.781)
10-min	0.135 (0.112-0.164)	0.192 (0.159-0.234)	0.266 (0.220-0.326)	0.327 (0.268-0.403)	0.408 (0.323-0.520)	0.470 (0.364-0.613)	0.533 (0.402-0.712)	0.597 (0.438-0.822)	0.684 (0.481-0.984)	0.752 (0.510-1.12)
15-min	0.163 (0.136-0.199)	0.232 (0.193-0.283)	0.322 (0.266-0.394)	0.395 (0.324-0.487)	0.493 (0.390-0.629)	0.568 (0.440-0.741)	0.644 (0.486-0.861)	0.722 (0.530-0.994)	0.827 (0.581-1.19)	0.909 (0.617-1.35)
30-min	0.225 (0.187-0.274)	0.320 (0.266-0.390)	0.444 (0.367-0.543)	0.544 (0.446-0.671)	0.680 (0.538-0.867)	0.783 (0.606-1.02)	0.888 (0.670-1.19)	0.995 (0.730-1.37)	1.14 (0.801-1.64)	1.25 (0.850-1.87)
60-min	0.329 (0.273-0.401)	0.469 (0.389-0.572)	0.650 (0.537-0.795)	0.797 (0.653-0.982)	0.995 (0.788-1.27)	1.15 (0.888-1.50)	1.30 (0.981-1.74)	1.46 (1.07-2.01)	1.67 (1.17-2.40)	1.83 (1.24-2.73)
2-hr	0.505 (0.419-0.615)	0.703 (0.583-0.857)	0.960 (0.794-1.17)	1.17 (0.957-1.44)	1.45 (1.14-1.84)	1.66 (1.28-2.16)	1.87 (1.41-2.50)	2.09 (1.53-2.88)	2.38 (1.67-3.42)	2.61 (1.77-3.88)
3-hr	0.651 (0.540-0.792)	0.896 (0.743-1.09)	1.21 (1.00-1.48)	1.47 (1.20-1.81)	1.81 (1.43-2.31)	2.07 (1.60-2.70)	2.33 (1.76-3.12)	2.60 (1.91-3.58)	2.96 (2.08-4.25)	3.23 (2.19-4.81)
6-hr	0.990 (0.821-1.20)	1.34 (1.11-1.64)	1.80 (1.49-2.20)	2.17 (1.78-2.67)	2.66 (2.11-3.40)	3.04 (2.35-3.96)	3.42 (2.58-4.57)	3.80 (2.79-5.23)	4.32 (3.03-6.20)	4.71 (3.19-7.02)
12-hr	1.38 (1.15-1.68)	1.87 (1.55-2.28)	2.51 (2.07-3.06)	3.02 (2.47-3.72)	3.71 (2.93-4.73)	4.23 (3.28-5.51)	4.76 (3.59-6.36)	5.29 (3.88-7.29)	6.02 (4.23-8.65)	6.58 (4.46-9.79)
24-hr	1.83 (1.63-2.11)	2.50 (2.21-2.87)	3.36 (2.97-3.88)	4.06 (3.56-4.72)	5.00 (4.24-6.02)	5.72 (4.75-7.04)	6.46 (5.22-8.14)	7.21 (5.67-9.35)	8.22 (6.20-11.1)	9.00 (6.55-12.6)
2-day	2.21 (1.96-2.54)	3.05 (2.71-3.51)	4.16 (3.68-4.80)	5.07 (4.44-5.90)	6.30 (5.34-7.59)	7.26 (6.02-8.93)	8.23 (6.66-10.4)	9.24 (7.26-12.0)	10.6 (8.00-14.4)	11.7 (8.50-16.4)
3-day	2.43 (2.15-2.79)	3.40 (3.01-3.92)	4.69 (4.15-5.42)	5.75 (5.04-6.70)	7.22 (6.12-8.69)	8.36 (6.93-10.3)	9.52 (7.71-12.0)	10.7 (8.45-13.9)	12.4 (9.36-16.8)	13.7 (9.99-19.2)
4-day	2.63 (2.33-3.02)	3.72 (3.30-4.28)	5.17 (4.57-5.97)	6.38 (5.59-7.43)	8.05 (6.82-9.69)	9.35 (7.76-11.5)	10.7 (8.66-13.5)	12.1 (9.52-15.7)	14.0 (10.6-19.0)	15.6 (11.3-21.8)
7-day	2.95 (2.62-3.39)	4.24 (3.76-4.88)	5.97 (5.28-6.90)	7.42 (6.50-8.64)	9.44 (8.00-11.4)	11.0 (9.16-13.6)	12.7 (10.3-16.0)	14.4 (11.4-18.7)	16.9 (12.7-22.8)	18.8 (13.7-26.4)
10-day	3.09 (2.75-3.56)	4.48 (3.97-5.16)	6.37 (5.63-7.35)	7.95 (6.96-9.25)	10.2 (8.61-12.2)	11.9 (9.89-14.7)	13.8 (11.1-17.4)	15.7 (12.4-20.4)	18.5 (13.9-25.0)	20.7 (15.0-28.9)
20-day	3.59 (3.19-4.13)	5.25 (4.65-6.04)	7.52 (6.65-8.68)	9.45 (8.29-11.0)	12.2 (10.3-14.7)	14.4 (12.0-17.8)	16.8 (13.6-21.2)	19.3 (15.2-25.0)	22.9 (17.3-31.0)	25.8 (18.8-36.2)
30-day	4.22 (3.75-4.86)	6.13 (5.43-7.05)	8.77 (7.75-10.1)	11.0 (9.67-12.8)	14.3 (12.1-17.2)	17.0 (14.1-20.9)	19.8 (16.0-25.0)	22.9 (18.0-29.7)	27.3 (20.6-36.9)	30.9 (22.5-43.3)
45-day	5.07 (4.50-5.83)	7.23 (6.41-8.32)	10.3 (9.06-11.8)	12.9 (11.3-15.0)	16.7 (14.1-20.1)	19.8 (16.4-24.4)	23.2 (18.8-29.2)	26.9 (21.1-34.9)	32.2 (24.3-43.6)	36.6 (26.7-51.3)
60-day	5.87 (5.21-6.75)	8.20 (7.27-9.45)	11.5 (10.2-13.3)	14.4 (12.6-16.7)	18.5 (15.7-22.3)	22.0 (18.3-27.1)	25.8 (20.8-32.5)	29.9 (23.5-38.8)	35.9 (27.1-48.6)	40.9 (29.8-57.3)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

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Lower Third Watersheds
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- Antelope Canyon

NOAA Atlas 14, Volume 6, Version 2
Location name: Rosamond, California, USA*
Latitude: 34.8154°, Longitude: -118.6452°
Elevation: 2974.82 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.078 (0.065-0.095)	0.100 (0.083-0.122)	0.131 (0.108-0.161)	0.158 (0.129-0.195)	0.197 (0.156-0.252)	0.229 (0.177-0.299)	0.263 (0.199-0.353)	0.301 (0.220-0.414)	0.354 (0.249-0.508)	0.397 (0.269-0.591)
10-min	0.112 (0.093-0.136)	0.144 (0.119-0.175)	0.188 (0.155-0.230)	0.226 (0.185-0.279)	0.282 (0.223-0.361)	0.328 (0.254-0.428)	0.378 (0.285-0.505)	0.431 (0.316-0.593)	0.507 (0.356-0.729)	0.569 (0.386-0.847)
15-min	0.135 (0.112-0.165)	0.174 (0.144-0.212)	0.228 (0.188-0.279)	0.274 (0.224-0.338)	0.342 (0.270-0.436)	0.397 (0.307-0.518)	0.457 (0.345-0.611)	0.521 (0.382-0.718)	0.613 (0.431-0.881)	0.688 (0.467-1.02)
30-min	0.189 (0.157-0.230)	0.242 (0.201-0.296)	0.318 (0.262-0.389)	0.382 (0.313-0.471)	0.476 (0.377-0.608)	0.554 (0.429-0.723)	0.637 (0.481-0.852)	0.726 (0.533-1.00)	0.855 (0.601-1.23)	0.959 (0.651-1.43)
60-min	0.272 (0.226-0.332)	0.349 (0.289-0.426)	0.458 (0.378-0.560)	0.551 (0.451-0.680)	0.687 (0.543-0.878)	0.799 (0.618-1.04)	0.919 (0.693-1.23)	1.05 (0.768-1.44)	1.23 (0.867-1.77)	1.38 (0.939-2.06)
2-hr	0.413 (0.342-0.504)	0.538 (0.446-0.657)	0.707 (0.583-0.865)	0.846 (0.693-1.04)	1.04 (0.823-1.33)	1.19 (0.923-1.56)	1.35 (1.02-1.80)	1.51 (1.11-2.08)	1.73 (1.21-2.48)	1.89 (1.28-2.82)
3-hr	0.533 (0.442-0.650)	0.698 (0.578-0.852)	0.915 (0.755-1.12)	1.09 (0.894-1.35)	1.33 (1.06-1.71)	1.52 (1.18-1.99)	1.71 (1.29-2.29)	1.91 (1.40-2.62)	2.16 (1.52-3.11)	2.35 (1.59-3.50)
6-hr	0.805 (0.667-0.981)	1.06 (0.875-1.29)	1.39 (1.14-1.70)	1.65 (1.35-2.04)	2.00 (1.58-2.56)	2.27 (1.76-2.96)	2.54 (1.92-3.40)	2.81 (2.06-3.87)	3.16 (2.22-4.55)	3.42 (2.32-5.10)
12-hr	1.13 (0.933-1.37)	1.50 (1.24-1.82)	1.98 (1.63-2.42)	2.36 (1.93-2.91)	2.87 (2.27-3.67)	3.26 (2.52-4.25)	3.65 (2.75-4.88)	4.03 (2.96-5.55)	4.54 (3.19-6.52)	4.91 (3.33-7.32)
24-hr	1.49 (1.32-1.71)	2.01 (1.78-2.31)	2.68 (2.37-3.09)	3.22 (2.82-3.75)	3.94 (3.34-4.75)	4.49 (3.73-5.52)	5.04 (4.08-6.35)	5.59 (4.40-7.25)	6.32 (4.77-8.55)	6.87 (5.00-9.62)
2-day	1.80 (1.59-2.07)	2.48 (2.19-2.85)	3.36 (2.97-3.88)	4.08 (3.57-4.75)	5.03 (4.26-6.05)	5.75 (4.77-7.07)	6.47 (5.24-8.16)	7.20 (5.67-9.34)	8.17 (6.16-11.0)	8.89 (6.47-12.5)
3-day	2.01 (1.78-2.31)	2.80 (2.48-3.23)	3.85 (3.40-4.45)	4.70 (4.12-5.47)	5.83 (4.94-7.02)	6.68 (5.54-8.22)	7.55 (6.11-9.51)	8.42 (6.62-10.9)	9.59 (7.23-13.0)	10.5 (7.63-14.7)
4-day	2.10 (1.87-2.42)	2.96 (2.63-3.41)	4.10 (3.62-4.73)	5.02 (4.40-5.84)	6.25 (5.30-7.53)	7.19 (5.97-8.85)	8.14 (6.59-10.3)	9.10 (7.16-11.8)	10.4 (7.83-14.1)	11.4 (8.28-15.9)
7-day	2.38 (2.11-2.73)	3.37 (2.98-3.88)	4.69 (4.14-5.42)	5.77 (5.06-6.72)	7.24 (6.14-8.72)	8.37 (6.94-10.3)	9.50 (7.69-12.0)	10.7 (8.39-13.8)	12.2 (9.21-16.5)	13.4 (9.76-18.8)
10-day	2.53 (2.25-2.91)	3.60 (3.19-4.15)	5.05 (4.46-5.83)	6.24 (5.47-7.26)	7.87 (6.67-9.48)	9.13 (7.57-11.2)	10.4 (8.42-13.1)	11.7 (9.21-15.2)	13.5 (10.2-18.2)	14.8 (10.8-20.8)
20-day	2.83 (2.52-3.26)	4.11 (3.64-4.73)	5.86 (5.18-6.77)	7.33 (6.42-8.53)	9.38 (7.95-11.3)	11.0 (9.12-13.5)	12.6 (10.2-15.9)	14.4 (11.3-18.6)	16.7 (12.6-22.6)	18.5 (13.5-25.9)
30-day	3.23 (2.87-3.72)	4.72 (4.18-5.43)	6.79 (6.00-7.84)	8.54 (7.48-9.94)	11.0 (9.34-13.3)	13.0 (10.8-16.0)	15.0 (12.2-18.9)	17.1 (13.5-22.2)	20.0 (15.1-27.1)	22.3 (16.2-31.2)
45-day	3.81 (3.38-4.38)	5.55 (4.92-6.39)	8.01 (7.08-9.24)	10.1 (8.86-11.8)	13.1 (11.1-15.8)	15.6 (12.9-19.1)	18.1 (14.6-22.8)	20.7 (16.3-26.9)	24.4 (18.4-33.0)	27.2 (19.8-38.1)
60-day	4.27 (3.79-4.91)	6.18 (5.48-7.12)	8.91 (7.88-10.3)	11.3 (9.88-13.1)	14.7 (12.4-17.7)	17.4 (14.5-21.4)	20.3 (16.4-25.6)	23.3 (18.4-30.3)	27.5 (20.8-37.2)	30.8 (22.4-43.1)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

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Middle Third Watersheds
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- Pescado Creek
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NOAA Atlas 14, Volume 6, Version 2
Location name: Rosamond, California, USA*
Latitude: 34.8673°, Longitude: -118.6713°
Elevation: 3572.86 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

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PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.098 (0.081-0.120)	0.127 (0.105-0.155)	0.166 (0.137-0.204)	0.200 (0.163-0.247)	0.248 (0.196-0.316)	0.286 (0.221-0.374)	0.328 (0.247-0.439)	0.372 (0.273-0.513)	0.437 (0.307-0.628)	0.491 (0.333-0.731)
10-min	0.141 (0.116-0.171)	0.182 (0.151-0.222)	0.238 (0.197-0.292)	0.286 (0.234-0.354)	0.355 (0.280-0.453)	0.410 (0.317-0.536)	0.470 (0.354-0.629)	0.534 (0.391-0.735)	0.627 (0.440-0.901)	0.704 (0.477-1.05)
15-min	0.170 (0.141-0.207)	0.220 (0.182-0.269)	0.288 (0.238-0.353)	0.346 (0.283-0.428)	0.429 (0.339-0.548)	0.496 (0.384-0.648)	0.568 (0.428-0.760)	0.646 (0.473-0.889)	0.758 (0.532-1.09)	0.851 (0.577-1.27)
30-min	0.237 (0.196-0.289)	0.307 (0.254-0.375)	0.402 (0.332-0.492)	0.483 (0.395-0.596)	0.598 (0.473-0.764)	0.692 (0.535-0.903)	0.791 (0.597-1.06)	0.900 (0.660-1.24)	1.06 (0.742-1.52)	1.19 (0.804-1.77)
60-min	0.345 (0.286-0.421)	0.447 (0.369-0.545)	0.585 (0.483-0.716)	0.703 (0.575-0.868)	0.871 (0.688-1.11)	1.01 (0.779-1.31)	1.15 (0.869-1.54)	1.31 (0.960-1.80)	1.54 (1.08-2.21)	1.73 (1.17-2.57)
2-hr	0.522 (0.432-0.636)	0.681 (0.564-0.832)	0.893 (0.737-1.09)	1.07 (0.874-1.32)	1.31 (1.04-1.67)	1.50 (1.16-1.96)	1.70 (1.28-2.27)	1.90 (1.40-2.62)	2.19 (1.54-3.15)	2.42 (1.64-3.60)
3-hr	0.669 (0.554-0.816)	0.875 (0.724-1.07)	1.15 (0.946-1.40)	1.37 (1.12-1.69)	1.67 (1.32-2.13)	1.91 (1.47-2.49)	2.15 (1.62-2.87)	2.39 (1.75-3.30)	2.74 (1.92-3.93)	3.00 (2.04-4.47)
6-hr	1.00 (0.831-1.22)	1.32 (1.09-1.61)	1.72 (1.42-2.11)	2.05 (1.68-2.54)	2.50 (1.98-3.19)	2.84 (2.19-3.70)	3.18 (2.40-4.26)	3.53 (2.59-4.86)	4.00 (2.81-5.76)	4.37 (2.96-6.51)
12-hr	1.39 (1.15-1.70)	1.85 (1.53-2.25)	2.43 (2.01-2.98)	2.91 (2.38-3.59)	3.54 (2.80-4.52)	4.02 (3.11-5.25)	4.50 (3.40-6.03)	5.00 (3.66-6.88)	5.65 (3.97-8.13)	6.15 (4.17-9.16)
24-hr	1.84 (1.64-2.12)	2.48 (2.20-2.85)	3.30 (2.92-3.81)	3.96 (3.47-4.61)	4.85 (4.11-5.84)	5.53 (4.59-6.80)	6.21 (5.02-7.83)	6.90 (5.43-8.95)	7.82 (5.90-10.6)	8.53 (6.21-12.0)
2-day	2.26 (2.00-2.60)	3.09 (2.73-3.55)	4.16 (3.68-4.80)	5.03 (4.41-5.86)	6.21 (5.26-7.48)	7.11 (5.90-8.74)	8.02 (6.49-10.1)	8.95 (7.04-11.6)	10.2 (7.69-13.8)	11.2 (8.12-15.6)
3-day	2.51 (2.23-2.88)	3.46 (3.07-3.98)	4.71 (4.16-5.43)	5.73 (5.02-6.67)	7.11 (6.02-8.56)	8.17 (6.78-10.0)	9.24 (7.48-11.7)	10.4 (8.14-13.4)	11.9 (8.94-16.0)	13.0 (9.48-18.2)
4-day	2.70 (2.39-3.10)	3.74 (3.32-4.31)	5.12 (4.53-5.92)	6.25 (5.48-7.28)	7.79 (6.60-9.38)	8.98 (7.45-11.0)	10.2 (8.24-12.8)	11.4 (9.00-14.8)	13.1 (9.91-17.8)	14.5 (10.5-20.3)
7-day	3.06 (2.71-3.52)	4.26 (3.78-4.91)	5.86 (5.18-6.76)	7.17 (6.29-8.35)	8.98 (7.61-10.8)	10.4 (8.61-12.8)	11.8 (9.57-14.9)	13.3 (10.5-17.3)	15.4 (11.6-20.8)	17.0 (12.4-23.8)
10-day	3.26 (2.89-3.75)	4.56 (4.04-5.25)	6.28 (5.55-7.25)	7.71 (6.76-8.98)	9.69 (8.21-11.7)	11.2 (9.31-13.8)	12.8 (10.4-16.2)	14.5 (11.4-18.8)	16.7 (12.6-22.7)	18.5 (13.5-26.0)
20-day	3.78 (3.35-4.34)	5.33 (4.73-6.14)	7.44 (6.57-8.58)	9.19 (8.06-10.7)	11.6 (9.87-14.0)	13.6 (11.3-16.7)	15.6 (12.6-19.7)	17.7 (13.9-23.0)	20.7 (15.6-28.0)	23.0 (16.8-32.2)
30-day	4.41 (3.91-5.07)	6.24 (5.53-7.18)	8.73 (7.72-10.1)	10.8 (9.50-12.6)	13.8 (11.7-16.6)	16.1 (13.4-19.9)	18.6 (15.0-23.4)	21.2 (16.7-27.5)	24.8 (18.7-33.6)	27.7 (20.2-38.9)
45-day	5.22 (4.63-6.00)	7.36 (6.53-8.48)	10.3 (9.11-11.9)	12.8 (11.2-14.9)	16.3 (13.8-19.7)	19.2 (15.9-23.6)	22.1 (17.9-27.9)	25.3 (19.9-32.8)	29.8 (22.4-40.3)	33.4 (24.3-46.7)
60-day	5.92 (5.25-6.81)	8.29 (7.34-9.54)	11.5 (10.2-13.3)	14.3 (12.5-16.7)	18.3 (15.5-22.0)	21.4 (17.8-26.4)	24.8 (20.1-31.3)	28.4 (22.3-36.8)	33.4 (25.2-45.3)	37.6 (27.3-52.6)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

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Upper Third Watersheds
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NOAA Atlas 14, Volume 6, Version 2
Location name: Rosamond, California, USA*
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NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.111 (0.092-0.135)	0.144 (0.119-0.176)	0.189 (0.156-0.232)	0.228 (0.186-0.281)	0.283 (0.223-0.361)	0.327 (0.253-0.428)	0.375 (0.283-0.502)	0.428 (0.314-0.589)	0.505 (0.355-0.726)	0.570 (0.386-0.849)
10-min	0.159 (0.132-0.194)	0.207 (0.171-0.252)	0.271 (0.224-0.332)	0.327 (0.267-0.403)	0.405 (0.320-0.518)	0.469 (0.363-0.613)	0.538 (0.406-0.720)	0.613 (0.449-0.845)	0.723 (0.508-1.04)	0.817 (0.554-1.22)
15-min	0.192 (0.159-0.235)	0.250 (0.207-0.305)	0.328 (0.271-0.402)	0.395 (0.323-0.488)	0.490 (0.387-0.626)	0.567 (0.439-0.741)	0.650 (0.491-0.871)	0.742 (0.544-1.02)	0.875 (0.615-1.26)	0.988 (0.670-1.47)
30-min	0.269 (0.223-0.329)	0.350 (0.289-0.428)	0.460 (0.379-0.563)	0.553 (0.452-0.683)	0.686 (0.542-0.877)	0.795 (0.615-1.04)	0.911 (0.687-1.22)	1.04 (0.761-1.43)	1.23 (0.861-1.76)	1.38 (0.938-2.06)
60-min	0.396 (0.328-0.483)	0.515 (0.426-0.629)	0.676 (0.558-0.828)	0.814 (0.665-1.00)	1.01 (0.798-1.29)	1.17 (0.904-1.53)	1.34 (1.01-1.79)	1.53 (1.12-2.11)	1.80 (1.27-2.59)	2.04 (1.38-3.03)
2-hr	0.600 (0.497-0.732)	0.783 (0.648-0.957)	1.03 (0.847-1.26)	1.23 (1.00-1.52)	1.51 (1.19-1.93)	1.73 (1.34-2.26)	1.97 (1.48-2.63)	2.21 (1.62-3.05)	2.56 (1.80-3.69)	2.85 (1.93-4.25)
3-hr	0.768 (0.636-0.937)	1.00 (0.830-1.23)	1.31 (1.08-1.61)	1.57 (1.28-1.94)	1.92 (1.52-2.45)	2.19 (1.69-2.86)	2.47 (1.86-3.31)	2.77 (2.03-3.81)	3.18 (2.24-4.58)	3.52 (2.39-5.24)
6-hr	1.15 (0.953-1.40)	1.51 (1.25-1.84)	1.97 (1.63-2.42)	2.35 (1.92-2.90)	2.86 (2.26-3.66)	3.26 (2.52-4.25)	3.66 (2.76-4.90)	4.07 (2.99-5.61)	4.64 (3.26-6.67)	5.09 (3.45-7.58)
12-hr	1.60 (1.32-1.95)	2.11 (1.75-2.58)	2.78 (2.29-3.40)	3.31 (2.71-4.09)	4.04 (3.19-5.16)	4.59 (3.55-5.99)	5.14 (3.88-6.89)	5.71 (4.19-7.87)	6.48 (4.55-9.32)	7.08 (4.80-10.5)
24-hr	2.12 (1.88-2.44)	2.84 (2.52-3.27)	3.77 (3.33-4.35)	4.52 (3.97-5.27)	5.54 (4.69-6.66)	6.30 (5.23-7.75)	7.08 (5.73-8.93)	7.87 (6.19-10.2)	8.94 (6.74-12.1)	9.76 (7.11-13.7)
2-day	2.62 (2.33-3.02)	3.56 (3.16-4.10)	4.79 (4.23-5.53)	5.78 (5.07-6.73)	7.13 (6.05-8.59)	8.17 (6.78-10.1)	9.22 (7.47-11.6)	10.3 (8.11-13.4)	11.8 (8.89-15.9)	12.9 (9.42-18.1)
3-day	2.91 (2.58-3.34)	3.99 (3.54-4.59)	5.40 (4.78-6.24)	6.56 (5.75-7.64)	8.15 (6.91-9.81)	9.38 (7.78-11.5)	10.6 (8.61-13.4)	11.9 (9.39-15.5)	13.7 (10.4-18.6)	15.1 (11.0-21.2)
4-day	3.15 (2.80-3.63)	4.35 (3.85-5.00)	5.92 (5.23-6.83)	7.21 (6.32-8.39)	8.99 (7.62-10.8)	10.4 (8.61-12.8)	11.8 (9.54-14.9)	13.3 (10.4-17.2)	15.3 (11.5-20.7)	16.9 (12.3-23.7)
7-day	3.60 (3.19-4.14)	4.97 (4.41-5.72)	6.78 (5.99-7.83)	8.28 (7.26-9.63)	10.3 (8.77-12.5)	12.0 (9.93-14.7)	13.6 (11.0-17.2)	15.4 (12.1-20.0)	17.8 (13.5-24.1)	19.8 (14.4-27.7)
10-day	3.85 (3.42-4.42)	5.32 (4.72-6.13)	7.27 (6.43-8.39)	8.89 (7.80-10.4)	11.1 (9.44-13.4)	12.9 (10.7-15.9)	14.7 (11.9-18.6)	16.7 (13.1-21.6)	19.3 (14.6-26.2)	21.5 (15.7-30.1)
20-day	4.50 (3.99-5.17)	6.26 (5.55-7.21)	8.62 (7.62-9.95)	10.6 (9.29-12.3)	13.3 (11.3-16.1)	15.5 (12.9-19.1)	17.8 (14.4-22.4)	20.2 (15.9-26.2)	23.6 (17.8-31.9)	26.4 (19.2-36.9)
30-day	5.29 (4.69-6.08)	7.38 (6.54-8.50)	10.2 (9.00-11.8)	12.5 (11.0-14.6)	15.8 (13.4-19.0)	18.4 (15.3-22.7)	21.2 (17.2-26.7)	24.1 (19.0-31.3)	28.3 (21.4-38.3)	31.7 (23.1-44.5)
45-day	6.26 (5.56-7.20)	8.70 (7.71-10.0)	12.0 (10.6-13.8)	14.8 (12.9-17.2)	18.6 (15.8-22.5)	21.8 (18.1-26.8)	25.1 (20.3-31.6)	28.6 (22.5-37.1)	33.6 (25.4-45.5)	37.8 (27.5-52.9)
60-day	7.12 (6.32-8.19)	9.82 (8.70-11.3)	13.5 (11.9-15.5)	16.5 (14.5-19.2)	20.9 (17.7-25.1)	24.3 (20.2-29.9)	28.0 (22.7-35.3)	32.0 (25.1-41.5)	37.7 (28.4-51.0)	42.3 (30.8-59.3)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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Cow Spring Canyon Creek

Rational method calculation to determine time of concentration for unit hydrograph.

Node	Area (acres)		Cover Type	Soil Group								Average CN	F_p	Percent Impervious	F_m	F_m average	Flowpath Length (ft)	Elevation (ft)			Slope (ft/ft)	V (fps)	T_c (min)	I (in/hr)	Q (cfs)	Travel Time (min)
	Subarea	Total		A	CN	B	CN	C	CN	D	CN							Upstream	Downstream	Difference						
`1-1	17.4	17	woodland, good							1	79	79.00	0.40	0%	0.40	0.40	1,136	5,720	5,580	140	0.12	3	22	1.95	24	n/a
1-2a	51.3	69	woodland, good					0.35	72	0.65	79	76.55	0.44	0%	0.44	0.43	888	5,580	5,320	260	0.29	5	25	1.85	88	2.7
`1-2b	10.3	79	woodland, good					0.35	72	0.65	79	76.55	0.44	0%	0.44	0.43	700	5,320	5,160	160	0.23	5	27	1.78	96	2.3
`1-2	102.5	181	woodland, good					0.35	72	0.65	79	76.55	0.44	0%	0.44	0.44	1,044	5,160	4,940	220	0.21	6	30	1.70	207	2.8
`1-3a	75.2	257	woodland, good					0.5	72	0.5	79	75.50	0.46	0%	0.46	0.44	1,200	4,940	4,500	440	0.37	8	32	1.65	278	2.4
`1-3	338.8	595	woodland, good					0.5	72	0.5	79	75.50	0.46	0%	0.46	0.45	526	4,500	4,280	220	0.42	11	33	1.63	629	0.8
`1-4a	45.3	641	woodland, good					0.35	72	0.65	79	76.55	0.44	0%	0.44	0.45	1,250	4,280	4,190	90	0.07	6	37	1.55	633	3.7
`1-4	73.1	714	woodland, good					0.35	72	0.65	79	76.55	0.44	0%	0.44	0.45	1,336	4,190	3,920	270	0.20	8	39	1.50	675	2.7
`1-5	541.4	1,255	woodland, good					0.85	72	0.15	79	73.05	0.50	0%	0.50	0.47	2,571	3,920	3,680	240	0.09	10	44	1.43	1,084	4.3
`1-6	235.3	1,491	woodland, good					0.3	72	0.7	79	76.90	0.44	0%	0.44	0.47	2,609	3,680	3,530	150	0.06	9	48	1.36	1,203	4.9
`1-7	288.0	1,779	open brush, good	0.35	30		55	0.2	70	0.45	77	59.15	0.70	0%	0.70	0.51	2,325	3,530	3,410	120	0.05	9	53	1.31	1,290	4.4
`1-8a	87.9	1,866	open brush, fair	0.9	46	0.1	66					48.00	0.84	0%	0.84	0.52	1,142	3,410	3,380	30	0.03	7	56	1.28	1,277	2.8
`1-8	173.0	2,040	open brush, fair	0.9	46	0.1	66					48.00	0.84	0%	0.84	0.55	1,458	3,380	3,340	40	0.03	7	59	1.25	1,282	3.5
`1-9	59.6	2,099	Chaparral, Narrowleaf			1	82					82.00	0.34	0%	0.34	0.54	2,537	3,340	3,250	90	0.04	7	65	1.20	1,234	5.7
`1-10	68.1	2,167	Barren			0.2	86	0.8	91			90.00	0.20	0%	0.20	0.53	2,513	3,250	3,180	70	0.03	6	72	1.14	1,191	6.8
`1-11	359.9	2,527	Barren	0.33	77	0.33	86	0.33	91			83.82	0.31	0%	0.31	0.50	3,106	3,180	3,060	120	0.04	7	79	1.09	1,349	7.3
`1-12	516.6	3,044	Barren	1	86							86.00	0.28	0%	0.28	0.46	2,773	3,060	3,010	50	0.02	8	85	1.06	1,629	6.0
`1-13	198.8	3,243	Chaparral, Narrowleaf			1	82					82.00	0.34	10%	0.31	0.45	2,538	3,010	2,985	25	0.01	5	93	1.01	1,632	8.5
`1-14	474.4	3,717	Chaparral, Narrowleaf			1	82					82.00	0.34	10%	0.31	0.43	2,678	2,985	2,965	20	0.01	5	103	0.97	1,788	9.4

*Tc determined from Initial Subarea Nomograph

Cow Spring Canyon Creek

Channel velocity calculations using Manning's equation to determine travel time.

Node	Channel Width	Flow Depth (ft)	Flow Area (sf)	Top Width	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Slope (ft/ft)	n	Velocity (ft/s)
`1-1	10	0.8	9	13	13.51	0.67	0.12	0.150	2.68
1-2a	10	1.3	16	15	15.74	1.02	0.29	0.150	5.46
`1-2b	10	1.4	19	16	16.46	1.13	0.23	0.150	5.16
`1-2	10	2.3	33	19	20.10	1.63	0.21	0.150	6.32
`1-3a	10	2.3	33	19	20.19	1.64	0.37	0.150	8.37
`1-3	15	2.9	59	26	27.77	2.13	0.42	0.150	10.63
`1-4a	15	4.6	111	33	35.55	3.13	0.07	0.150	5.70
`1-4	15	3.6	80	29	31.17	2.58	0.20	0.150	8.40
`1-5	25	3.4	110	39	40.42	2.72	0.09	0.090	9.86
`1-6	40	3.0	135	52	53.20	2.55	0.06	0.075	8.88
`1-7	40	3.2	147	53	54.18	2.71	0.05	0.075	8.78
`1-8a	100	1.8	185	107	107.98	1.71	0.03	0.050	6.91
`1-8	100	1.8	183	107	107.89	1.69	0.03	0.050	7.01
`1-9	100	1.6	165	106	107.15	1.54	0.04	0.050	7.48
`1-10	100	1.9	195	108	108.39	1.80	0.03	0.060	6.12
`1-11	100	1.8	190	107	108.19	1.76	0.04	0.060	7.10
`1-12	40	4.3	210	57	59.32	3.54	0.02	0.060	7.75
`1-13	100	3.1	327	112	113.79	2.88	0.01	0.060	4.99
`1-14	100	3.5	378	114	115.81	3.27	0.01	0.060	4.73

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```
        U n i t   H y d r o g r a p h   A n a l y s i s

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                Study date  05/10/17

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
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Kern County Synthetic Unit Hydrograph Hydrology Method
                Manual date - 1992


Program License Serial Number 6297

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-----------------------------------------------------------------------

        COW SPRING CANYON CREEK

        Storm Event Year = 100

 English (in-lb) Input Units Used

 English Rainfall Data (Inches) Input Values Used

 English Units used in output format


RAINFALL DATA INPUT:
Slope of Intensity-Duration Curve Slope = 0.600

Zone Designation:       Desert Region   Latitude =  34.75

Area averaged rainfall intensity isohyetal data:
        Sub-Area        Duration        Isohyetal
        (Ac.)            (hours)         (In)
Rainfall data for year 2
           714.00            6           2.10
          1326.00            6           1.60
          1677.00            6           1.10
-----------------------------------------------------------------------
Rainfall data for year 2
           714.00           24           3.80
          1326.00           24           3.00
          1677.00           24           2.10
-----------------------------------------------------------------------
Rainfall data for year 100
           714.00            6           5.00
          1326.00            6           3.90
          1677.00            6           2.70
-----------------------------------------------------------------------
Rainfall data for year 100
           714.00           24           9.60
          1326.00           24           7.40
          1677.00           24           5.20
-----------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
DESERT REGION area of study
Log-Log Rainfall Intensity Slope =  0.60
```

```
---------------------------------------------------------------------

******** Area-averaged max loss rate, Fm ********


SCS curve     Area       Area       Fp      Ap        Fm
Number         (Ac.)    Fraction   (In/Hr)  (dec.)   (In/Hr)
 77.0        714.00      0.192     0.434    1.000    0.434
 64.0       1326.00      0.357     0.644    1.000    0.644
 84.0       1677.00      0.451     0.308    1.000    0.308

Area-averaged adjusted loss rate Fm (In/Hr) =  0.452

********* Area-Averaged low loss rate fraction, Yb **********

Area       Area          SCS CN        S     Pervious
 (Ac.)      Fract         (AMC2)             Yield Fr
   714.00   0.192         77.0         2.99     0.617

  1326.00   0.357         64.0         5.63     0.421

  1677.00   0.451         84.0         1.90     0.729

Area-averaged catchment yield fraction, Y =  0.597
Area-averaged low loss fraction, Yb =  0.403
User entry of time of concentration  =   1.713 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =    3717.00(Ac.)
Catchment Lag time =   1.370 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time =  6.0809
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.452(In/Hr)
Average low loss rate fraction (Yb) = 0.403 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall =  0.664(In)
Computed peak 30-minute rainfall =  1.360(In)
Specified peak 1-hour rainfall =  1.794(In)
Computed peak 3-hour rainfall =  2.736(In)
Specified peak 6-hour rainfall =  3.570(In)
Specified peak 24-hour rainfall =  6.830(In)


Rainfall depth area reduction factors:
Using a total area of    3717.00(Ac.) (Ref: fig. E-4)

5-minute factor = 0.834     Adjusted rainfall =  0.554(In)
30-minute factor = 0.834    Adjusted rainfall =  1.134(In)
1-hour factor = 0.834       Adjusted rainfall =  1.496(In)
3-hour factor = 0.975       Adjusted rainfall =  2.668(In)
6-hour factor = 0.988       Adjusted rainfall =  3.525(In)
24-hour factor = 0.993      Adjusted rainfall =  6.779(In)
---------------------------------------------------------------------

                        U n i t  H y d r o g r a p h
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values             ((CFS))
---------------------------------------------------------------------
                (K =     44952.47 (CFS))

  1                 0.338                  151.863
  2                 1.013                  303.726
```

```
270              0.0125           0.0050              0.0074
271              0.0124           0.0050              0.0074
272              0.0123           0.0049              0.0073
273              0.0122           0.0049              0.0073
274              0.0121           0.0049              0.0072
275              0.0121           0.0049              0.0072
276              0.0120           0.0048              0.0072
277              0.0119           0.0048              0.0071
278              0.0118           0.0048              0.0071
279              0.0118           0.0047              0.0070
280              0.0117           0.0047              0.0070
281              0.0116           0.0047              0.0069
282              0.0115           0.0046              0.0069
283              0.0115           0.0046              0.0069
284              0.0114           0.0046              0.0068
285              0.0113           0.0046              0.0068
286              0.0113           0.0045              0.0067
287              0.0112           0.0045              0.0067
288              0.0112           0.0045              0.0067
---------------------------------------------------------------------
                 6.7790           2.4916              4.2874
---------------------------------------------------------------------
---------------------------------------------------------------------
Total soil rain loss =      2.49(In)
Total effective rainfall =      4.29(In)
Peak flow rate in flood hydrograph =   3499.83(CFS)
-----------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R    S T O R M
               R u n o f f      H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))

---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0      875.0    1750.0    2625.0    3500.0
-----------------------------------------------------------------------
  0+ 5       0.0069      1.01  Q         |         |         |         |
  0+10       0.0278      3.03  Q         |         |         |         |
  0+15       0.0626      5.05  Q         |         |         |         |
  0+20       0.1161      7.77  Q         |         |         |         |
  0+25       0.1927     11.12  Q         |         |         |         |
  0+30       0.2982     15.32  Q         |         |         |         |
  0+35       0.4397     20.53  Q         |         |         |         |
  0+40       0.6267     27.15  Q         |         |         |         |
  0+45       0.8655     34.68  Q         |         |         |         |
  0+50       1.1798     45.63  Q         |         |         |         |
  0+55       1.5916     59.80  Q         |         |         |         |
  1+ 0       2.1288     78.00  Q         |         |         |         |
  1+ 5       2.7924     96.35  VQ        |         |         |         |
  1+10       3.6309    121.76  VQ        |         |         |         |
  1+15       4.5133    128.13  VQ        |         |         |         |
  1+20       5.4745    139.56  VQ        |         |         |         |
  1+25       6.5184    151.57  VQ        |         |         |         |
  1+30       7.6298    161.38  VQ        |         |         |         |
  1+35       8.8047    170.59  VQ        |         |         |         |
  1+40      10.0341    178.51  V Q       |         |         |         |
  1+45      11.3168    186.25  V Q       |         |         |         |
  1+50      12.6482    193.32  V Q       |         |         |         |
  1+55      14.0212    199.37  V Q       |         |         |         |
  2+ 0      15.4320    204.84  V Q       |         |         |         |
  2+ 5      16.8780    209.96  V Q       |         |         |         |
  2+10      18.3593    215.09  V Q       |         |         |         |
  2+15      19.8735    219.85  V Q       |         |         |         |
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12+50     348.5524    540.32  |     Q   V          |          |          |
12+55     352.2792    541.12  |     Q   V          |          |          |
13+ 0     356.0056    541.07  |     Q   V          |          |          |
13+ 5     359.7308    540.90  |     Q   V          |          |          |
13+10     363.4429    538.99  |     Q   V          |          |          |
13+15     367.1814    542.84  |     Q   |V         |          |          |
13+20     370.9388    545.58  |     Q   |V         |          |          |
13+25     374.7135    548.08  |     Q   |V         |          |          |
13+30     378.5135    551.75  |     Q   |V         |          |          |
13+35     382.3395    555.54  |     Q   |V         |          |          |
13+40     386.1982    560.27  |     Q   |V         |          |          |
13+45     390.0894    565.00  |     Q   |V         |          |          |
13+50     394.0187    570.53  |     Q   |V         |          |          |
13+55     397.9879    576.33  |     Q   |V         |          |          |
14+ 0     402.0029    582.98  |     Q   | V        |          |          |
14+ 5     406.0699    590.53  |     Q   | V        |          |          |
14+10     410.1998    599.66  |     Q   | V        |          |          |
14+15     414.3933    608.90  |     Q   | V        |          |          |
14+20     418.6606    619.61  |      Q  | V        |          |          |
14+25     423.0059    630.95  |      Q  | V        |          |          |
14+30     427.4411    643.99  |      Q  | V        |          |          |
14+35     431.9725    657.96  |      Q  |  V       |          |          |
14+40     436.6164    674.29  |      Q  |  V       |          |          |
14+45     441.3789    691.51  |      Q  |  V       |          |          |
14+50     446.2883    712.85  |       Q |  V       |          |          |
14+55     451.3644    737.05  |       Q |  V       |          |          |
15+ 0     456.6404    766.07  |       Q |  V       |          |          |
15+ 5     462.1192    795.53  |        Q|  V       |          |          |
15+10     467.8534    832.60  |        Q|   V      |          |          |
15+15     473.7380    854.45  |        Q|   V      |          |          |
15+20     479.8168    882.65  |         Q   V      |          |          |
15+25     486.0882    910.60  |         Q   V      |          |          |
15+30     492.5490    938.11  |         Q   V      |          |          |
15+35     499.2036    966.25  |         |Q   V     |          |          |
15+40     506.0632    996.01  |         |Q   V     |          |          |
15+45     513.1355   1026.90  |         |Q   V     |          |          |
15+50     520.4469   1061.62  |         | Q  V     |          |          |
15+55     528.0341   1101.66  |         | Q  V     |          |          |
16+ 0     536.0031   1157.10  |         |  Q  V    |          |          |
16+ 5     544.8036   1277.83  |         |   Q V    |          |          |
16+10     554.3968   1392.93  |         |    QV    |          |          |
16+15     564.3299   1442.28  |         |     QV   |          |          |
16+20     574.9134   1536.74  |         |      Q   |          |          |
16+25     586.1572   1632.60  |         |      VQ  |          |          |
16+30     598.1767   1745.22  |         |       VQ|          |          |
16+35     611.2484   1898.02  |         |       V |Q         |          |
16+40     625.6041   2084.44  |         |       V |  Q       |          |
16+45     641.1524   2257.61  |         |        V|    Q     |          |
16+50     659.1106   2607.53  |         |        V|        Q|          |
16+55     679.1983   2916.74  |         |         V          |  Q       |
17+ 0     701.5730   3248.81  |         |          |V        |     Q    |
17+ 5     723.9321   3246.54  |         |          |V        |     Q    |
17+10     748.0356   3499.83  |         |          | V       |       Q|
17+15     763.3543   2224.27  |         |          |  V Q    |          |
17+20     780.4751   2485.94  |         |          |  V    Q |          |
17+25     797.4947   2471.24  |         |          |   V   Q |          |
17+30     813.2055   2281.22  |         |          |   V Q   |          |
17+35     828.1300   2167.03  |         |          |   Q     |          |
17+40     842.0679   2023.79  |         |          |  Q V    |          |
17+45     855.5305   1954.77  |         |          | Q  V    |          |
17+50     868.2334   1844.46  |         |          |Q    V   |          |
17+55     880.0765   1719.62  |         |        Q|     V   |          |
18+ 0     891.2507   1622.49  |         |       Q |     V   |          |
```

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Tentrock Canyon Creek

Rational method calculation to determine time of concentration for unit hydrograph.

Node	Area (acres)		Cover Type	Soil Group								Average CN	F_p	Percent Impervious	F_m	F_m average	Flowpath Length (ft)	Elevation (ft)			Slope (ft/ft)	V (fps)	T_c (min)	I (in/hr)	Q (cfs)	Travel Time (min)
	Subarea	Total		A	CN	B	CN	C	CN	D	CN							Upstream	Downstream	Difference						
`2-1	28.6	29	woodland, fair		36		66		77	1	83	83.00	0.32	0%	0.32	0.32	1,041	5,759	5,675	84	0.08	3	18	2.14	47	n/a
`2-2a	27.1	56	woodland, fair		36		66		77	1	83	83.00	0.32	0%	0.32	0.32	1,100	5,675	5,520	155	0.14	4	22.4	1.94	81	4.4
`2-2	30.3	86	woodland, fair		36		66		77	1	83	83.00	0.32	0%	0.32	0.32	1,300	5,520	5,320	200	0.15	5	27.0	1.78	113	4.6
`2-3a	50.0	136	woodland, fair		36		66		77	1	83	83.00	0.32	0%	0.32	0.32	1,400	5,320	5,000	320	0.23	5	31.4	1.66	164	4.4
`2-3	227.1	363	woodland, fair		36		66		77	1	83	83.00	0.32	0%	0.32	0.32	1,450	5,000	4,800	200	0.14	6	35.4	1.57	410	4.0
`2-4a	80.4	444	woodland, fair	0.5	36		66		77	0.5	83	59.50	0.70	0%	0.70	0.39	1,250	4,800	4,580	220	0.18	7	38.4	1.52	450	3.1
`2-4	39.4	483	woodland, fair	0.5	36		66		77	0.5	83	59.50	0.70	0%	0.70	0.41	1,200	4,580	4,400	180	0.15	6	41.5	1.46	456	3.1
`2-5a	26.0	509	woodland, fair	0.9	36		66	0.05	77	0.05	83	40.40	0.91	0%	0.91	0.44	1,255	4,400	4,000	400	0.32	8	44.0	1.42	451	2.5
`2-5	647.2	1,156	woodland, fair	0.9	36		66	0.05	77	0.05	83	40.40	0.91	0%	0.91	0.70	1,450	4,000	3,800	200	0.14	7	47.4	1.38	704	3.4
`2-6a	106.7	1,263	woodland, fair	0.8	36		66		77	0.2	83	45.40	0.86	0%	0.86	0.72	1,146	3,800	3,790	10	0.01	5	51.6	1.33	694	4.2
`2-6	349.5	1,612	woodland, fair	0.8	36		66		77	0.2	83	45.40	0.86	0%	0.86	0.75	1,320	3,790	3,780	10	0.01	5	56.5	1.27	763	4.9
`2-7	605.1	2,217	woodland, fair	0.8	36		66		77	0.2	83	45.40	0.86	0%	0.86	0.78	2,510	3,780	3,690	90	0.04	8	61.9	1.22	884	5.5
`2-8	537.8	2,755	woodland, fair	0.9	36		66		77	0.1	83	40.70	0.91	0%	0.91	0.80	2,520	3,690	3,620	70	0.03	7	67.8	1.17	911	5.9
`2-9a	550.0	3,305	woodland, fair	0.9	36		66		77	0.1	83	40.70	0.91	0%	0.91	0.82	1,923	3,620	3,500	120	0.06	7	72.4	1.14	937	4.6
`2-9	176.1	3,481	woodland, fair	0.9	36		66		77	0.1	83	40.70	0.91	0%	0.91	0.83	2,600	3,500	3,360	140	0.05	6	79.3	1.09	829	6.9
`2-10	1,010.5	4,492	woodland, poor	0.8	45	0.05	66		77	0.15	83	51.75	0.80	0%	0.80	0.82	2,650	3,360	3,325	35	0.01	7	85.3	1.05	950	6.0
`2-11	215.9	4,708	Chaparral, Narrowleaf	0.85	71		82	0.15	88		91	73.55	0.49	0%	0.49	0.80	2,550	3,325	3,280	45	0.02	8	90.5	1.03	939	5.2
`2-12	159.9	4,868	Chaparral, Narrowleaf	0.5	71		82	0.5	88		91	79.50	0.39	0%	0.39	0.79	2,610	3,280	3,200	80	0.03	8	96.3	1.00	907	5.7
`2-13	324.4	5,192	Chaparral, Narrowleaf		71	0.05	82	0.85	88	0.1	91	88.00	0.24	0%	0.24	0.76	2,700	3,200	3,120	80	0.03	8	102.1	0.97	1,006	5.8
`2-14	114.0	5,306	Chaparral, Narrowleaf		71		82		88	1	91	91.00	0.18	0%	0.18	0.74	2,590	3,120	3,100	20	0.01	7	108.0	0.95	969	6.0
`2-15	59.1	5,365	Chaparral, Narrowleaf		71		82	0.5	88	0.5	91	89.50	0.20	0%	0.20	0.74	2,590	3,100	3,060	40	0.02	8	113.6	0.93	905	5.6
`2-16	89.0	5,454	barren			0.3	86	0.7	91			89.50	0.20	0%	0.20	0.73	2,600	3,060	3,030	30	0.01	7	119.9	0.90	853	6.3
`2-17	60.4	5,514	barren			1	86					86.00	0.28	0%	0.28	0.72	2,450	3,030	3,010	20	0.01	5	127.7	0.88	760	7.8
`2-18	96.2	5,611	barren			1	86					86.00	0.28	0%	0.28	0.72	1,606	3,010	2,995	15	0.01	5	132.7	0.86	735	5.0
`2-19a	87.5	5,698	Close seeded,poor			1	72					72.00	0.52	0%	0.52	0.71	1,209	2,995	2,985	10	0.01	5	136.5	0.85	705	3.8
`2-19b	46.9	5,745	Close seeded,poor			1	72					72.00	0.52	0%	0.52	0.71	810	2,985	2,975	10	0.01	6	138.8	0.85	686	2.3
`2-19	69.0	5,814	Close seeded,poor			1	72					72.00	0.52	0%	0.52	0.71	1,400	2,975	2,965	10	0.01	5	143.6	0.83	639	4.8

*Tc determined from Initial Subarea Nomograph

Tentrock Canyon Creek

Channel velocity calculations using Manning's equation to determine travel time.

Node	Channel Width	Flow Depth (ft)	Flow Area (sf)	Top Width	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Slope (ft/ft)	n	Velocity (ft/s)
`2-1	10	1.3	16	15	15.78	1.03	0.08	0.150	2.88
`2-2a	10	1.5	20	16	16.73	1.17	0.14	0.150	4.14
`2-2	10	1.8	24	17	17.90	1.34	0.15	0.150	4.73
`2-3a	20	1.4	31	25	26.08	1.18	0.23	0.150	5.32
`2-3	20	2.7	67	31	31.91	2.11	0.14	0.150	6.08
`2-4a	20	2.6	66	30	31.72	2.09	0.18	0.150	6.80
`2-4	20	2.8	71	31	32.35	2.18	0.15	0.150	6.47
`2-5a	20	2.2	54	29	29.91	1.81	0.32	0.150	8.33
`2-5	20	3.6	98	34	36.11	2.71	0.14	0.150	7.18
`2-6a	40	3.3	152	53	54.57	2.78	0.01	0.060	4.58
`2-6	40	3.6	169	54	56.03	3.02	0.01	0.060	4.51
`2-7	45	2.3	115	54	55.38	2.08	0.04	0.060	7.67
`2-8	45	2.5	128	55	56.40	2.26	0.03	0.060	7.14
`2-9a	110	1.2	136	115	115.40	1.18	0.06	0.060	6.91
`2-9	110	1.2	132	115	115.24	1.14	0.05	0.060	6.30
`2-10	45	2.6	128	55	56.45	2.27	0.01	0.040	7.40
`2-11	45	2.3	116	54	55.45	2.09	0.02	0.040	8.10
`2-12	60	1.9	120	68	68.40	1.75	0.03	0.050	7.58
`2-13	60	2.0	129	68	69.02	1.87	0.03	0.050	7.79
`2-14	20	4.6	134	38	40.49	3.30	0.01	0.040	7.25
`2-15	20	4.1	117	37	38.47	3.03	0.02	0.050	7.76
`2-16	20	4.3	124	37	39.35	3.15	0.01	0.050	6.88
`2-17	40	3.1	146	53	54.08	2.69	0.01	0.050	5.21
`2-18	40	3.0	136	52	53.28	2.56	0.01	0.050	5.39
`2-19a	35	3.2	134	48	49.45	2.71	0.01	0.050	5.27
`2-19b	35	2.8	115	46	47.66	2.42	0.01	0.050	5.96
`2-19	35	3.2	132	48	49.23	2.67	0.01	0.050	4.85

2.3.txt

```
        U n i t   H y d r o g r a p h   A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 2004-2012, Version 7.1

                Study date  05/10/17

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
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Kern County Synthetic Unit Hydrograph Hydrology Method
                Manual date - 1992


Program License Serial Number 6297

--------------------------------------------------------------------
-------------------------------------------------------------------

        TENTROCK CANYON CREEK

        Storm Event Year = 100

 English (in-lb) Input Units Used

 English Rainfall Data (Inches) Input Values Used

 English Units used in output format


RAINFALL DATA INPUT:
Slope of Intensity-Duration Curve Slope = 0.600

Zone Designation:       Desert Region   Latitude =  34.75

Area averaged rainfall intensity isohyetal data:
        Sub-Area        Duration        Isohyetal
        (Ac.)            (hours)         (In)
Rainfall data for year 2
          1156.00            6           2.10
          4150.00            6           1.60
           508.00            6           1.10
-------------------------------------------------------------------
Rainfall data for year 2
          1156.00           24           3.80
          4150.00           24           3.00
           508.00           24           2.10
-------------------------------------------------------------------
Rainfall data for year 100
          1156.00            6           5.00
          4150.00            6           3.90
           508.00            6           2.70
-------------------------------------------------------------------
Rainfall data for year 100
          1156.00           24           9.60
          4150.00           24           7.40
           508.00           24           5.20
-------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
DESERT REGION area of study
Log-Log Rainfall Intensity Slope =  0.60
```

2.3.txt

```
-----------------------------------------------------------------------

******** Area-averaged max loss rate, Fm ********


SCS curve     Area       Area       Fp      Ap        Fm
Number         (Ac.)    Fraction   (In/Hr)  (dec.)   (In/Hr)
 72.0       1156.00      0.199     0.518    1.000    0.518
 58.0       4150.00      0.714     0.724    1.000    0.724
 85.0        508.00      0.087     0.290    1.000    0.290

Area-averaged adjusted loss rate Fm (In/Hr) =  0.645

********* Area-Averaged low loss rate fraction, Yb **********

Area       Area          SCS CN        S     Pervious
 (Ac.)      Fract         (AMC2)             Yield Fr
  1156.00   0.199         72.0         3.89     0.574

  4150.00   0.714         58.0         7.24     0.374

   508.00   0.087         85.0         1.76     0.768

Area-averaged catchment yield fraction, Y =  0.448
Area-averaged low loss fraction, Yb =  0.552
User entry of time of concentration  =   2.393 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =    5814.00(Ac.)
Catchment Lag time =   1.914 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time =  4.3530
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.645(In/Hr)
Average low loss rate fraction (Yb) = 0.552 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall =  0.735(In)
Computed peak 30-minute rainfall =  1.504(In)
Specified peak 1-hour rainfall =  1.985(In)
Computed peak 3-hour rainfall =  3.057(In)
Specified peak 6-hour rainfall =  4.014(In)
Specified peak 24-hour rainfall =  7.645(In)


Rainfall depth area reduction factors:
Using a total area of    5814.00(Ac.) (Ref: fig. E-4)

5-minute factor = 0.765     Adjusted rainfall =  0.562(In)
30-minute factor = 0.765    Adjusted rainfall =  1.151(In)
1-hour factor = 0.765       Adjusted rainfall =  1.519(In)
3-hour factor = 0.960       Adjusted rainfall =  2.933(In)
6-hour factor = 0.981       Adjusted rainfall =  3.937(In)
24-hour factor = 0.988      Adjusted rainfall =  7.555(In)
-----------------------------------------------------------------------

                        U n i t  H y d r o g r a p h
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values             ((CFS))
-----------------------------------------------------------------------
                (K =     70313.06 (CFS))

  1                 0.242                  170.039
  2                 0.725                  340.079
```

```
282              0.0128           0.0071              0.0057
283              0.0128           0.0070              0.0057
284              0.0127           0.0070              0.0057
285              0.0126           0.0070              0.0056
286              0.0125           0.0069              0.0056
287              0.0125           0.0069              0.0056
288              0.0124           0.0068              0.0056
---------------------------------------------------------------------
                 7.5551           3.8456              3.7095
---------------------------------------------------------------------
---------------------------------------------------------------------
Total soil rain loss =      3.85(In)
Total effective rainfall =      3.71(In)
Peak flow rate in flood hydrograph =   4576.32(CFS)
-----------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R    S T O R M
               R u n o f f      H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))

---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0     1150.0    2300.0    3450.0    4600.0
---------------------------------------------------------------------
  0+ 5       0.0065      0.94  Q         |         |         |         |
  0+10       0.0259      2.82  Q         |         |         |         |
  0+15       0.0584      4.71  Q         |         |         |         |
  0+20       0.1038      6.60  Q         |         |         |         |
  0+25       0.1655      8.95  Q         |         |         |         |
  0+30       0.2484     12.04  Q         |         |         |         |
  0+35       0.3532     15.22  Q         |         |         |         |
  0+40       0.4857     19.24  Q         |         |         |         |
  0+45       0.6488     23.70  Q         |         |         |         |
  0+50       0.8502     29.23  Q         |         |         |         |
  0+55       1.0957     35.65  Q         |         |         |         |
  1+ 0       1.3885     42.52  Q         |         |         |         |
  1+ 5       1.7393     50.94  Q         |         |         |         |
  1+10       2.1684     62.29  Q         |         |         |         |
  1+15       2.6874     75.36  Q         |         |         |         |
  1+20       3.3233     92.33  Q         |         |         |         |
  1+25       4.0775    109.51  Q         |         |         |         |
  1+30       4.9504    126.74  VQ        |         |         |         |
  1+35       5.9348    142.93  VQ        |         |         |         |
  1+40       7.1366    174.51  VQ        |         |         |         |
  1+45       8.3417    174.98  VQ        |         |         |         |
  1+50       9.6267    186.59  VQ        |         |         |         |
  1+55      10.9929    198.37  VQ        |         |         |         |
  2+ 0      12.4307    208.77  VQ        |         |         |         |
  2+ 5      13.9307    217.80  VQ        |         |         |         |
  2+10      15.4931    226.86  VQ        |         |         |         |
  2+15      17.1095    234.71  V Q       |         |         |         |
  2+20      18.7775    242.19  V Q       |         |         |         |
  2+25      20.4968    249.64  V Q       |         |         |         |
  2+30      22.2653    256.79  V Q       |         |         |         |
  2+35      24.0773    263.10  V Q       |         |         |         |
  2+40      25.9290    268.87  V Q       |         |         |         |
  2+45      27.8178    274.26  V Q       |         |         |         |
  2+50      29.7417    279.35  V Q       |         |         |         |
  2+55      31.7004    284.39  V Q       |         |         |         |
  3+ 0      33.6942    289.51  V Q       |         |         |         |
  3+ 5      35.7209    294.28  V Q       |         |         |         |
  3+10      37.7799    298.97  V Q       |         |         |         |
  3+15      39.8694    303.39  V Q       |         |         |         |
```

2.3.txt

```
13+50     479.1500    734.87  |     Q   V          |          |          |
13+55     484.2529    740.95  |     Q   V          |          |          |
14+ 0     489.4056    748.17  |     Q   V          |          |          |
14+ 5     494.6157    756.51  |     Q   V          |          |          |
14+10     499.8971    766.86  |     Q   V          |          |          |
14+15     505.2499    777.22  |     Q   |V         |          |          |
14+20     510.6816    788.69  |     Q   |V         |          |          |
14+25     516.1943    800.45  |     Q   |V         |          |          |
14+30     521.8021    814.25  |      Q  |V         |          |          |
14+35     527.5053    828.10  |      Q  |V         |          |          |
14+40     533.3200    844.29  |      Q  |V         |          |          |
14+45     539.2487    860.85  |      Q  |V         |          |          |
14+50     545.3103    880.13  |      Q  |V         |          |          |
14+55     551.5111    900.36  |      Q  | V        |          |          |
15+ 0     557.8637    922.41  |       Q | V        |          |          |
15+ 5     564.3800    946.17  |       Q | V        |          |          |
15+10     571.0960    975.16  |       Q | V        |          |          |
15+15     578.0251   1006.10  |       Q | V        |          |          |
15+20     585.2130   1043.68  |        Q| V        |          |          |
15+25     592.6487   1079.65  |        Q|  V       |          |          |
15+30     600.3370   1116.35  |        Q|  V       |          |          |
15+35     608.2721   1152.18  |         Q  V       |          |          |
15+40     616.5988   1209.03  |         Q  V       |          |          |
15+45     625.0713   1230.22  |         Q  V       |          |          |
15+50     633.7997   1267.36  |         |Q V       |          |          |
15+55     642.8313   1311.39  |         |Q  V      |          |          |
16+ 0     652.2671   1370.08  |         |Q  V      |          |          |
16+ 5     662.5984   1500.11  |         |  QV      |          |          |
16+10     673.7588   1620.48  |         |   Q      |          |          |
16+15     685.1940   1660.39  |         |   QV     |          |          |
16+20     696.9601   1708.44  |         |   QV     |          |          |
16+25     709.3041   1792.34  |         |    Q     |          |          |
16+30     722.3701   1897.19  |         |    VQ    |          |          |
16+35     735.8052   1950.78  |         |     Q    |          |          |
16+40     750.0000   2061.09  |         |     VQ   |          |          |
16+45     764.7775   2145.70  |         |     V Q  |          |          |
16+50     780.5179   2285.51  |         |      V Q|          |          |
16+55     797.1111   2409.33  |         |      V  Q          |          |
17+ 0     814.3153   2498.05  |         |      V  |Q         |          |
17+ 5     833.2278   2746.09  |         |       V |  Q       |          |
17+10     854.4921   3087.58  |         |       V |     Q    |          |
17+15     877.3679   3321.58  |         |        V|       Q  |
17+20     902.7381   3683.74  |         |        V|          |  Q       |
17+25     928.2630   3706.23  |         |         V          |  Q       |
17+30     954.2543   3773.93  |         |         V          |  Q       |
17+35     979.7563   3702.89  |         |         |V         |  Q       |
17+40    1011.2737   4576.32  |         |         | V        |       Q  |
17+45    1025.8999   2123.72  |         |       Q | V        |          |
17+50    1046.1340   2937.99  |         |         | V  Q     |          |
17+55    1066.2293   2917.83  |         |         |  V Q     |          |
18+ 0    1085.3774   2780.32  |         |         |  VQ      |          |
18+ 5    1103.2643   2597.17  |         |         | Q V      |          |
18+10    1120.6884   2529.98  |         |         |Q  V      |          |
18+15    1137.1148   2385.12  |         |         Q   V      |          |
18+20    1152.9352   2297.13  |         |        Q|    V     |          |
18+25    1168.3600   2239.67  |         |        Q|    V     |          |
18+30    1183.1498   2147.48  |         |      Q  |    V     |          |
18+35    1197.0884   2023.89  |         |     Q   |     V    |          |
18+40    1210.1921   1902.65  |         |    Q    |     V    |          |
18+45    1222.9019   1845.47  |         |    Q    |     V    |          |
18+50    1235.1570   1779.44  |         |   Q     |      V   |          |
18+55    1247.1640   1743.41  |         |   Q     |      V   |          |
19+ 0    1258.9241   1707.56  |         |  Q      |      V   |          |
```

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Horse Camp Canyon Creek

Rational method calculation to determine time of concentration for unit hydrograph.

Node	Area (acres)		Cover Type	Soil Group								Average CN	F_p	Percent Impervious	F_m	F_m average	Flowpath Length (ft)	Elevation (ft)			Slope (ft/ft)	V (fps)	T_c (min)	I (in/hr)	Q (cfs)	Travel Time (min)
	Subarea	Total		A	CN	B	CN	C	CN	D	CN							Upstream	Downstream	Difference						
`3-1	12.1	12	woodland, good	1	30							30.00	1.00	0%	1.00	1.00	913	3,901	3,700	201	0.22	3	19.5	2.06	12	n/a
`3-2	123.5	136	Woodland, poor	0.5	45					0.5	83	64.00	0.64	0%	0.64	0.67	2,350	3,700	3,400	300	0.13	7	25.3	1.83	142	5.78
`3-3	81.2	217	Chaparral, Narrowleaf	0.15	71			0.85	88			85.45	0.28	0%	0.28	0.52	1,980	3,400	3,300	100	0.05	6	30.7	1.68	225	5.4
`3-4a	85.9	303	Chaparral, Narrowleaf	0.2	71			0.8	88			84.60	0.30	0%	0.30	0.46	1,850	3,300	3,200	100	0.05	7	34.8	1.59	306	4.1
`3-4	105.6	408	Chaparral, Narrowleaf	0.2	71			0.8	88			84.60	0.30	0%	0.30	0.42	1,913	3,200	3,165	35	0.02	6	40.1	1.49	393	5.3
`3-5	151.2	559	Chaparral, Narrowleaf					1	88			88.00	0.24	0%	0.24	0.37	2,823	3,165	3,080	85	0.03	9	45.5	1.40	521	5.5
`3-6a	44.9	604	Chaparral, Narrowleaf					1	88			88.00	0.24	0%	0.24	0.36	1,000	3,080	3,070	10	0.01	4	49.9	1.35	537	4.4
`3-6b	12.8	617	Chaparral, Narrowleaf					1	88			88.00	0.24	0%	0.24	0.36	900	3,070	3,060	10	0.01	4	53.7	1.30	525	3.8
`3-6	6.7	624	Chaparral, Narrowleaf					1	88			88.00	0.24	0%	0.24	0.36	799	3,060	3,055	5	0.01	3	57.8	1.26	507	4.1
`3-7a	63.7	688	Chaparral, Narrowleaf			0.45	82	0.55	88			85.30	0.29	0%	0.29	0.35	1,312	3,055	3,040	15	0.01	5	62.3	1.22	536	4.5
`3-7	12.8	700	Chaparral, Narrowleaf			0.45	82	0.55	88			85.30	0.29	0%	0.29	0.35	1,133	3,040	3,025	15	0.01	5	66.1	1.18	527	3.7
`3-8a	22.4	723	Close seeded,poor			1	77					77.00	0.43	0%	0.43	0.35	1,718	3,025	3,000	25	0.01	4	73.2	1.13	507	7.1
`3-8	47.3	770	Close seeded,poor			1	77					77.00	0.43	0%	0.43	0.36	1,850	3,000	2,975	25	0.01	4	81.0	1.08	501	7.8
`3-9	1,101.1	1,871	Chaparral, Narrowleaf			0.5	82	0.5	88			85.00	0.29	0%	0.29	0.32	2,150	2,975	2,965	10	0.00	4	90.1	1.03	1,195	9.1

*Tc determined from Initial Subarea Nomograph

Horse Camp Canyon Creek

Channel velocity calculations using Manning's equation to determine travel time.

Node	Channel Width	Flow Depth (ft)	Flow Area (sf)	Top Width	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Slope (ft/ft)	n	Velocity (ft/s)
`3-1	10	0.3	4	11	11.51	0.31	0.22	0.100	3.23
`3-2	10	1.6	21	16	17.12	1.23	0.13	0.090	6.78
`3-3	10	2.5	37	20	21.06	1.76	0.05	0.080	6.09
`3-4a	10	2.7	41	21	21.92	1.86	0.05	0.070	7.50
`3-4	10	3.7	65	25	26.59	2.43	0.02	0.060	6.07
`3-5	15	2.9	60	27	27.97	2.16	0.03	0.050	8.63
`3-6a	90	1.5	140	96	96.75	1.45	0.01	0.050	3.82
`3-6b	90	1.4	134	96	96.46	1.39	0.01	0.050	3.91
`3-6	90	1.7	157	97	97.51	1.61	0.01	0.050	3.23
`3-7a	50	2.0	111	58	59.16	1.87	0.01	0.050	4.84
`3-7	50	1.9	105	58	58.68	1.78	0.01	0.050	5.04
`3-8a	100	1.2	126	105	105.48	1.19	0.01	0.050	4.04
`3-8	100	1.2	128	105	105.57	1.21	0.01	0.050	3.93
`3-9	100	2.9	304	111	112.85	2.69	0.00	0.050	3.93

3.3.txt

```
        U n i t   H y d r o g r a p h   A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 2004-2012, Version 7.1

                Study date  05/10/17

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Kern County Synthetic Unit Hydrograph Hydrology Method
                Manual date - 1992


Program License Serial Number 6297

---------------------------------------------------------------------
---------------------------------------------------------------------

        HORSE CAMP CANYON CREEK

        Storm Event Year = 100

 English (in-lb) Input Units Used

 English Rainfall Data (Inches) Input Values Used

 English Units used in output format


RAINFALL DATA INPUT:
Slope of Intensity-Duration Curve Slope = 0.600

Zone Designation:       Desert Region   Latitude =  34.74

Area averaged rainfall intensity isohyetal data:
        Sub-Area        Duration        Isohyetal
        (Ac.)            (hours)         (In)
Rainfall data for year 2
           408.00            6           1.60
          1463.00            6           1.10
---------------------------------------------------------------------
Rainfall data for year 2
           408.00           24           3.00
          1463.00           24           2.10
---------------------------------------------------------------------
Rainfall data for year 100
           408.00            6           3.90
          1463.00            6           2.70
---------------------------------------------------------------------
Rainfall data for year 100
           408.00           24           7.40
          1463.00           24           5.20
---------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
DESERT REGION area of study
Log-Log Rainfall Intensity Slope =  0.60
---------------------------------------------------------------------

******** Area-averaged max loss rate, Fm ********
```

3.3.txt

```
SCS curve     Area       Area       Fp      Ap        Fm
Number         (Ac.)    Fraction   (In/Hr)  (dec.)   (In/Hr)
 66.0        408.00      0.218     0.614    1.000    0.614
 85.0       1463.00      0.782     0.290    1.000    0.290

Area-averaged adjusted loss rate Fm (In/Hr) =  0.361

********* Area-Averaged low loss rate fraction, Yb **********

Area       Area          SCS CN        S     Pervious
 (Ac.)      Fract         (AMC2)             Yield Fr
   408.00   0.218         66.0         5.15     0.388

  1463.00   0.782         85.0         1.76     0.704

Area-averaged catchment yield fraction, Y =  0.636
Area-averaged low loss fraction, Yb =  0.364
User entry of time of concentration  =   1.502 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =    1871.00(Ac.)
Catchment Lag time =   1.202 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time =  6.9352
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.361(In/Hr)
Average low loss rate fraction (Yb) = 0.364 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall =  0.570(In)
Computed peak 30-minute rainfall =  1.167(In)
Specified peak 1-hour rainfall =  1.540(In)
Computed peak 3-hour rainfall =  2.300(In)
Specified peak 6-hour rainfall =  2.962(In)
Specified peak 24-hour rainfall =  5.680(In)


Rainfall depth area reduction factors:
Using a total area of    1871.00(Ac.) (Ref: fig. E-4)

5-minute factor = 0.916     Adjusted rainfall =  0.523(In)
30-minute factor = 0.916    Adjusted rainfall =  1.070(In)
1-hour factor = 0.916       Adjusted rainfall =  1.412(In)
3-hour factor = 0.987       Adjusted rainfall =  2.271(In)
6-hour factor = 0.994       Adjusted rainfall =  2.943(In)
24-hour factor = 0.996      Adjusted rainfall =  5.658(In)
----------------------------------------------------------------------

                        U n i t  H y d r o g r a p h
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values             ((CFS))
----------------------------------------------------------------------
                (K =     22627.41 (CFS))

  1                0.385                  87.181
  2                1.156                 174.362
  3                1.967                 183.441
  4                3.141                 265.648
  5                4.560                 321.153
  6                6.414                 419.456
  7                8.841                 549.199
  8               11.724                 652.394
  9               15.970                 960.829
```

3.3.txt

Total soil rain loss = 1.85(In)
Total effective rainfall = 3.81(In)
Peak flow rate in flood hydrograph = 1774.65(CFS)

++

24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 450.0 900.0 1350.0 1800.0
0+ 5	0.0035	0.51	Q | | | |
0+10	0.0142	1.54	Q | | | |
0+15	0.0323	2.63	Q | | | |
0+20	0.0612	4.20	Q | | | |
0+25	0.1032	6.10	Q | | | |
0+30	0.1624	8.59	Q | | | |
0+35	0.2440	11.85	Q | | | |
0+40	0.3523	15.73	Q | | | |
0+45	0.4999	21.43	Q | | | |
0+50	0.7022	29.37	Q | | | |
0+55	0.9687	38.70	Q | | | |
1+ 0	1.3154	50.34	VQ | | | |
1+ 5	1.7043	56.47	VQ | | | |
1+10	2.1291	61.67	VQ | | | |
1+15	2.5957	67.75	VQ | | | |
1+20	3.0963	72.70	VQ | | | |
1+25	3.6280	77.19	VQ | | | |
1+30	4.1867	81.12	VQ | | | |
1+35	4.7714	84.90	VQ | | | |
1+40	5.3782	88.11	VQ | | | |
1+45	6.0043	90.90	V Q | | | |
1+50	6.6481	93.49	V Q | | | |
1+55	7.3095	96.03	V Q | | | |
2+ 0	7.9872	98.40	V Q | | | |
2+ 5	8.6800	100.60	V Q | | | |
2+10	9.3873	102.70	V Q | | | |
2+15	10.1082	104.68	V Q | | | |
2+20	10.8417	106.50	V Q | | | |
2+25	11.5871	108.24	V Q | | | |
2+30	12.3441	109.91	V Q | | | |
2+35	13.1124	111.55	V Q | | | |
2+40	13.8916	113.15	V Q | | | |
2+45	14.6817	114.72	V Q | | | |
2+50	15.4819	116.18	|VQ | | | |
2+55	16.2916	117.56	|VQ | | | |
3+ 0	17.1106	118.93	|VQ | | | |
3+ 5	17.9382	120.16	|VQ | | | |
3+10	18.7741	121.38	|VQ | | | |
3+15	19.6184	122.59	|VQ | | | |
3+20	20.4706	123.74	|VQ | | | |
3+25	21.3306	124.87	|VQ | | | |
3+30	22.1984	126.01	|VQ | | | |
3+35	23.0738	127.11	|VQ | | | |
3+40	23.9564	128.15	|VQ | | | |
3+45	24.8460	129.18	|VQ | | | |
3+50	25.7428	130.21	|VQ | | | |
3+55	26.6467	131.25	|VQ | | | |
4+ 0	27.5573	132.21	|VQ | | | |
4+ 5	28.4743	133.16	|VQ | | | |
4+10	29.3980	134.12	|VQ | | | |

3.3.txt

```
14+45     200.6784    299.79  |      Q    |  V       |          |          |
14+50     202.8052    308.81  |      Q    |  V       |          |          |
14+55     205.0004    318.75  |       Q   |  V       |          |          |
15+ 0     207.2744    330.19  |       Q   |  V       |          |          |
15+ 5     209.6155    339.92  |       Q   |   V      |          |          |
15+10     212.0258    349.98  |       Q   |   V      |          |          |
15+15     214.5117    360.94  |        Q  |   V      |          |          |
15+20     217.0763    372.39  |        Q  |   V      |          |          |
15+25     219.7224    384.20  |        Q  |   V      |          |          |
15+30     222.4550    396.78  |        Q  |   V      |          |          |
15+35     225.2813    410.38  |         Q|    V     |          |          |
15+40     228.2103    425.30  |         Q|    V     |          |          |
15+45     231.2525    441.72  |         Q|    V     |          |          |
15+50     234.4252    460.69  |          Q    V     |          |          |
15+55     237.7617    484.46  |          Q     V   |          |          |
16+ 0     241.3264    517.59  |          |Q    V   |          |          |
16+ 5     245.3731    587.58  |          |  Q  V   |          |          |
16+10     249.8991    657.17  |          |   Q V   |          |          |
16+15     254.7117    698.79  |          |    Q V  |          |          |
16+20     260.0256    771.58  |          |      Q  |          |          |
16+25     265.8265    842.29  |          |      VQ |          |          |
16+30     272.2762    936.49  |          |       V Q          |          |
16+35     279.4998   1048.87  |          |       V |  Q       |          |
16+40     287.5433   1167.91  |          |        V|    Q     |          |
16+45     296.9637   1367.85  |          |         V        Q |          |
16+50     307.8595   1582.07  |          |         V         |    Q     |
16+55     319.5014   1690.40  |          |         |V        |      Q   |
17+ 0     331.7235   1774.65  |          |         | V       |        Q |
17+ 5     340.9786   1343.85  |          |         | V     Q |          |
17+10     349.4832   1234.86  |          |         |  V   Q  |          |
17+15     358.0952   1250.46  |          |         |   V  Q  |          |
17+20     365.9038   1133.81  |          |         |   VQ    |          |
17+25     373.2060   1060.29  |          |         |  Q V    |          |
17+30     379.9807    983.69  |          |         |Q   V    |          |
17+35     386.4205    935.05  |          |        Q     V  |          |
17+40     392.3431    859.97  |          |       Q|     V  |          |
17+45     397.8560    800.47  |          |      Q |     V  |          |
17+50     403.0798    758.49  |          |     Q  |      V |          |
17+55     408.1070    729.95  |          |     Q  |      V |          |
18+ 0     412.8673    691.20  |          |    Q   |      V |          |
18+ 5     417.4007    658.24  |          |   Q    |       V|          |
18+10     421.7435    630.57  |          |   Q    |       V|          |
18+15     425.8976    603.18  |          |  Q     |       V|          |
18+20     429.8543    574.51  |          | Q      |       V|          |
18+25     433.6648    553.29  |          | Q      |        V|          |
18+30     437.3515    535.31  |          |Q       |        V|          |
18+35     440.9421    521.36  |          |Q       |        V|          |
18+40     444.4265    505.94  |          |Q       |        V|          |
18+45     447.8251    493.47  |          Q       |         V          |
18+50     451.1025    475.88  |          Q       |         V          |
18+55     454.2876    462.49  |          Q       |         V          |
19+ 0     457.4127    453.76  |          Q       |         V          |
19+ 5     460.4195    436.59  |         Q|       |         |V         |
19+10     463.3656    427.77  |         Q|       |         |V         |
19+15     466.2624    420.62  |         Q|       |         |V         |
19+20     469.0813    409.30  |         Q|       |         |V         |
19+25     471.8488    401.84  |        Q |       |         |V         |
19+30     474.5720    395.41  |        Q |       |         |V         |
19+35     477.2338    386.49  |        Q |       |         | V        |
19+40     479.8151    374.81  |        Q |       |         | V        |
19+45     482.3561    368.96  |        Q |       |         | V        |
19+50     484.8586    363.36  |        Q |       |         | V        |
19+55     487.3157    356.76  |       Q  |       |         | V        |
```

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Oso Canyon Creek

Rational method calculation to determine time of concentration for unit hydrograph.

Node	Area (acres)		Cover Type	Soil Group								Average CN	F_p	Percent Impervious	F_m	F_m average	Flowpath Length (ft)	Elevation (ft)			Slope (ft/ft)	V (fps)	T_c (min)	I (in/hr)	Q (cfs)	Travel Time (min)
	Subarea	Total		A	CN	B	CN	C	CN	D	CN							Upstream	Downstream	Difference						
`4-0	13.4	13	Woodland, FAIR		36	0.5	60	0.5	73		79	66.5	0.60	0%	0.60	0.60	737	4,800	4,680	120	0.16	4	14.0	2.50	23	n/a
`4-1a	11.0	24	Woodland, FAIR		36	0.5	60	0.5	73		79	66.5	0.60	0%	0.60	0.60	700	4,680	4,600	80	0.11	4	17.0	2.28	37	3.0
`4-1	68.6	93	Woodland, FAIR		36	0.5	60	0.5	73		79	66.5	0.60	0%	0.60	0.60	1,283	4,600	4,340	260	0.20	7	20.2	2.10	126	3.2
`4-2a	19.0	112	Woodland, FAIR		36	0.8	60	0.2	73		79	62.6	0.66	0%	0.66	0.61	515	4,340	4,280	60	0.12	5	21.8	2.03	143	1.6
`4-2b	46.7	159	Woodland, FAIR		36	0.8	60	0.2	73		79	62.6	0.66	0%	0.66	0.62	885	4,280	4,200	80	0.09	5	24.6	1.92	185	2.8
`4-2c	20.2	179	Woodland, FAIR		36	0.8	60	0.2	73		79	62.6	0.66	0%	0.66	0.63	750	4,200	4,160	40	0.05	5	27.3	1.82	192	2.8
`4-2	77.0	256	Woodland, FAIR		36	0.8	60	0.2	73		79	62.6	0.66	0%	0.66	0.64	1,015	4,160	4,140	20	0.02	3	32.2	1.69	242	4.85
`4-3a	48.8	305	Woodland, FAIR	0.1	36	0.8	60	0.1	73		79	58.9	0.71	0%	0.71	0.65	1,212	4,140	4,000	140	0.12	7	35.3	1.62	265	3.1
`4-3	55.3	360	Woodland, FAIR	0.1	36	0.8	60	0.1	73		79	58.9	0.71	0%	0.71	0.66	1,365	4,000	3,920	80	0.06	5	39.5	1.53	283	4.3
`4-4	1,293.0	1,653	Woodland, FAIR	0.05	36	0.15	60	0.5	73	0.25	79	67.05	0.59	0%	0.59	0.61	2,554	3,920	3,820	100	0.04	10	43.6	1.46	1,270	4.1
`4-5	549.6	2,203	Woodland, FAIR	0.05	36	0.5	60	0.3	73	0.1	79	61.6	0.67	0%	0.67	0.62	2,514	3,820	3,760	60	0.02	7	49.5	1.38	1,493	5.9
`4-6	300.3	2,503	Woodland, FAIR	0.15	36	0.25	60	0.6	73		79	64.2	0.63	0%	0.63	0.62	2,536	3,760	3,700	60	0.02	8	54.7	1.31	1,550	5.2
`4-7	388.3	2,891	Woodland, FAIR	0	36	0.5	60	0.4	73	0.1	79	67.1	0.59	0%	0.59	0.62	2,643	3,700	3,600	100	0.04	9	59.8	1.26	1,660	5.1
`4-8	159.4	3,051	Woodland, FAIR	0.2	36	0.5	60		73	0.3	79	60.9	0.68	0%	0.68	0.62	2,646	3,600	3,500	100	0.04	8	65.7	1.20	1,593	5.9
`4-9	1,150.2	4,201	Woodland, FAIR	0.1	36	0.3	60	0.15	73	0.45	79	68.1	0.58	0%	0.58	0.61	2,543	3,500	3,430	70	0.03	8	70.7	1.16	2,085	5.0
`4-10	117.1	4,318	Woodland, poor		45	1	66		77		83	66	0.61	0%	0.61	0.61	2,732	3,430	3,360	70	0.03	8	76.3	1.12	1,983	5.6
`4-11	357.0	4,675	Woodland, poor		45	0.5	66	0.05	77	0.45	83	74.2	0.48	0%	0.48	0.60	2,615	3,360	3,335	25	0.01	6	83.6	1.07	1,988	7.3
`4-12	877.5	5,552	Woodland, poor		45		66	0.5	77	0.5	83	80	0.38	0%	0.38	0.57	2,609	3,335	3,275	60	0.02	9	88.3	1.05	2,398	4.6
`4-13	236.9	5,789	Woodland, poor					1	77			77	0.43	0%	0.43	0.56	2,767	3,275	3,240	35	0.01	10	93.0	1.02	2,395	4.7
`4-14	145.0	5,934	Woodland, poor					1	77			77	0.43	0%	0.43	0.56	2,528	3,240	3,210	30	0.01	4	102.4	0.97	2,228	9.4
`4-15	887.9	6,822	Woodland, poor			0.4	66	0.6	77			72.6	0.51	0%	0.51	0.55	2,770	3,210	3,155	55	0.02	11	106.8	0.96	2,484	4.4
`4-16	4,406.1	11,228	Woodland, poor	0.05	45	0.2	66	0.6	77	0.15	83	74.1	0.48	0%	0.48	0.52	3,200	3,155	3,150	5	0.00	5	116.7	0.92	3,960	9.9
`4-17	106.0	11,334	Barren			0.9	86	0.1	91			86.5	0.26	20%	0.21	0.52	3,064	3,150	3,120	30	0.01	9	122.6	0.90	3,812	5.9
`4-17a	56.2	11,391	Woodland, poor			0.55	86	0.45	91			88.25	0.23	20%	0.18	0.52	2,700	3,120	3,095	25	0.01	6	129.6	0.87	3,610	7.0
`4-18	4,716.3	16,107	Woodland, poor	0	45	0.1	66	0.8	77	0.1	83	76.5	0.44	2%	0.43	0.49	2,642	3,095	3,073	23	0.01	6	137.1	0.85	5,133	7.5
`4-19	75.7	16,183	Barren			0.8	86	0.2	91			87	0.25	0%	0.25	0.49	2,627	3,073	3,050	23	0.01	11	141.0	0.84	5,011	3.9
`4-20	644.6	16,827	Barren	0.1	77	0.2	86	0.7	91			88.6	0.22	10%	0.20	0.48	2,510	3,050	3,028	23	0.01	10	145.0	0.83	5,213	4.0
`4-21	4,568.5	21,396	Barren	0.05	45	0.8	66	0.05	77	0.1	83	67.2	0.59	2%	0.58	0.50	2,695	3,028	3,010	18	0.01	7	151.2	0.81	5,920	6.2
`4-22	163.6	21,559	Barren			1	86		91			86	0.27	2%	0.27	0.50	2,613	3,010	2,995	15	0.01	7	157.5	0.79	5,697	6.3
`4-23	100.1	21,659	Barren			1	86		91			86	0.27	2%	0.27	0.50	2,687	2,995	2,985	10	0.00	6	165.1	0.78	5,402	7.6
`4-24	70.2	21,730	Barren			1	86		91			86	0.27	2%	0.27	0.50	1,392	2,985	2,978	8	0.01	7	168.7	0.77	5,283	3.5

*Tc determined from Initial Subarea Nomograph

Oso Canyon Creek

Channel velocity calculations using Manning's equation to determine travel time.

Node	Channel Width	Flow Depth (ft)	Flow Area (sf)	Top Width	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Slope (ft/ft)	n	Velocity (ft/s)
`4-0	10	0.6	6	12	12.46	0.49	0.16	0.100	3.74
`4-1a	10	0.8	9	13	13.61	0.69	0.11	0.100	3.93
`4-1	10	1.5	19	16	16.53	1.14	0.20	0.110	6.66
`4-2a	20	1.2	27	25	25.38	1.06	0.12	0.100	5.30
`4-2b	20	1.5	35	26	26.74	1.30	0.09	0.100	5.33
`4-2c	20	1.8	42	27	28.04	1.51	0.05	0.100	4.54
`4-2	20	2.7	69	31	32.19	2.15	0.02	0.100	3.49
`4-3a	20	1.7	41	27	27.74	1.46	0.12	0.100	6.53
`4-3	20	2.2	53	29	29.77	1.79	0.06	0.100	5.31
`4-4	20	4.3	121	37	39.04	3.11	0.04	0.060	10.47
`4-5	70	2.8	209	81	82.38	2.54	0.02	0.060	7.14
`4-6	70	2.5	191	80	81.39	2.35	0.02	0.050	8.10
`4-7	70	2.6	193	80	81.50	2.37	0.04	0.060	8.59
`4-8	100	2.0	212	108	109.11	1.94	0.04	0.060	7.52
`4-9	100	2.4	247	109	110.54	2.23	0.03	0.050	8.45
`4-10	100	2.3	245	109	110.45	2.21	0.03	0.050	8.10
`4-11	100	3.1	334	113	114.04	2.93	0.01	0.050	5.96
`4-12	70	3.3	255	83	84.87	3.00	0.02	0.050	9.41
`4-13	70	3.2	245	83	84.36	2.91	0.01	0.035	9.76
`4-14	300	1.6	498	307	307.34	1.62	0.01	0.050	4.48
`4-15	90	2.5	236	100	101.10	2.33	0.02	0.035	10.54
`4-16	100	6.5	737	126	129.16	5.71	0.00	0.035	5.37
`4-17	60	6.1	440	84	87.24	5.04	0.01	0.050	8.67
`4-17a	150	3.6	560	164	165.93	3.37	0.01	0.050	6.45
`4-18	270	3.2	879	283	284.23	3.09	0.01	0.050	5.84
`4-19	40	8.0	446	72	75.63	5.89	0.01	0.040	11.25
`4-20	70	6.1	497	94	97.09	5.12	0.01	0.040	10.48
`4-21	200	3.9	817	216	217.57	3.75	0.01	0.040	7.25
`4-22	200	4.0	828	216	217.81	3.80	0.01	0.040	6.88
`4-23	200	4.4	917	218	219.64	4.17	0.00	0.040	5.89
`4-24	200	3.9	806	216	217.35	3.71	0.01	0.040	6.55

4.3.txt

```
        U n i t   H y d r o g r a p h   A n a l y s i s

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                Study date  05/10/17

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
---------------------------------------------------------------------------

Kern County Synthetic Unit Hydrograph Hydrology Method
                Manual date - 1992


Program License Serial Number 6297

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---------------------------------------------------------------------

        OSO CANYON CREEK

        Storm Event Year = 100

 English (in-lb) Input Units Used

 English Rainfall Data (Inches) Input Values Used

 English Units used in output format


RAINFALL DATA INPUT:
Slope of Intensity-Duration Curve Slope = 0.600

Zone Designation:       Desert Region   Latitude =  34.75

Area averaged rainfall intensity isohyetal data:
        Sub-Area        Duration        Isohyetal
        (Ac.)            (hours)         (In)
Rainfall data for year 2
          2891.00            6           1.30
         13216.00            6           1.30
          5623.00            6           1.20
---------------------------------------------------------------------
Rainfall data for year 2
          2891.00           24           2.50
         13216.00           24           2.50
          5623.00           24           2.20
---------------------------------------------------------------------
Rainfall data for year 100
          2891.00            6           3.40
         13216.00            6           3.20
          5623.00            6           2.70
---------------------------------------------------------------------
Rainfall data for year 100
          2891.00           24           6.50
         13216.00           24           6.30
          5623.00           24           5.60
---------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
DESERT REGION area of study
Log-Log Rainfall Intensity Slope =  0.60
```

```
-----------------------------------------------------------------------

******** Area-averaged max loss rate, Fm ********


SCS curve     Area       Area       Fp      Ap        Fm
Number         (Ac.)    Fraction   (In/Hr)  (dec.)   (In/Hr)
 64.0       2891.00      0.133     0.644    1.000    0.644
 75.0      13216.00      0.608     0.470    1.000    0.470
 83.0       5623.00      0.259     0.326    1.000    0.326

Area-averaged adjusted loss rate Fm (In/Hr) =  0.456

********* Area-Averaged low loss rate fraction, Yb **********

Area       Area          SCS CN        S     Pervious
 (Ac.)      Fract         (AMC2)             Yield Fr
  2891.00   0.133         64.0         5.63     0.385

 13216.00   0.608         75.0         3.33     0.554

  5623.00   0.259         83.0         2.05     0.688

Area-averaged catchment yield fraction, Y =  0.566
Area-averaged low loss fraction, Yb =  0.434
User entry of time of concentration  =   2.811 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =   21730.00(Ac.)
Catchment Lag time =   2.249 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time =  3.7057
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.456(In/Hr)
Average low loss rate fraction (Yb) = 0.434 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall =  0.575(In)
Computed peak 30-minute rainfall =  1.177(In)
Specified peak 1-hour rainfall =  1.554(In)
Computed peak 3-hour rainfall =  2.372(In)
Specified peak 6-hour rainfall =  3.097(In)
Specified peak 24-hour rainfall =  6.145(In)


Rainfall depth area reduction factors:
Using a total area of   21730.00(Ac.) (Ref: fig. E-4)

5-minute factor = 0.511     Adjusted rainfall =  0.294(In)
30-minute factor = 0.538    Adjusted rainfall =  0.634(In)
1-hour factor = 0.554       Adjusted rainfall =  0.861(In)
3-hour factor = 0.881       Adjusted rainfall =  2.090(In)
6-hour factor = 0.947       Adjusted rainfall =  2.934(In)
24-hour factor = 0.967      Adjusted rainfall =  5.943(In)
-----------------------------------------------------------------------

                        U n i t  H y d r o g r a p h
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values             ((CFS))
-----------------------------------------------------------------------
                (K =    262797.19 (CFS))

  1                 0.206                  541.023
  2                 0.618                 1082.047
```

```
      251              0.0134           0.0058              0.0076
      252              0.0133           0.0058              0.0075
      253              0.0132           0.0057              0.0075
      254              0.0131           0.0057              0.0074
      255              0.0130           0.0056              0.0074
      256              0.0129           0.0056              0.0073
      257              0.0128           0.0056              0.0073
      258              0.0127           0.0055              0.0072
      259              0.0126           0.0055              0.0071
      260              0.0125           0.0054              0.0071
      261              0.0124           0.0054              0.0070
      262              0.0123           0.0054              0.0070
      263              0.0123           0.0053              0.0069
      264              0.0122           0.0053              0.0069
      265              0.0121           0.0052              0.0068
      266              0.0120           0.0052              0.0068
      267              0.0119           0.0052              0.0068
      268              0.0118           0.0051              0.0067
      269              0.0118           0.0051              0.0067
      270              0.0117           0.0051              0.0066
      271              0.0116           0.0050              0.0066
      272              0.0115           0.0050              0.0065
      273              0.0115           0.0050              0.0065
      274              0.0114           0.0049              0.0065
      275              0.0113           0.0049              0.0064
      276              0.0113           0.0049              0.0064
      277              0.0112           0.0049              0.0063
      278              0.0111           0.0048              0.0063
      279              0.0111           0.0048              0.0063
      280              0.0110           0.0048              0.0062
      281              0.0110           0.0048              0.0062
      282              0.0109           0.0047              0.0062
      283              0.0108           0.0047              0.0061
      284              0.0108           0.0047              0.0061
      285              0.0107           0.0046              0.0061
      286              0.0107           0.0046              0.0060
      287              0.0106           0.0046              0.0060
      288              0.0106           0.0046              0.0060
      ---------------------------------------------------------------
                       5.9429           2.4816              3.4613
      ---------------------------------------------------------------
      ---------------------------------------------------------------
      Total soil rain loss =      2.48(In)
      Total effective rainfall =      3.46(In)
      Peak flow rate in flood hydrograph =  10753.46(CFS)
      ------------------------------------------------------------------
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0     2700.0    5400.0    8100.0   10800.0
-------------------------------------------------------------------
  0+ 5       0.0222      3.22  Q         |         |         |         |
  0+10       0.0888      9.67  Q         |         |         |         |
  0+15       0.1999     16.14  Q         |         |         |         |
  0+20       0.3557     22.62  Q         |         |         |         |
  0+25       0.5566     29.16  Q         |         |         |         |
  0+30       0.8202     38.27  Q         |         |         |         |
  0+35       1.1570     48.91  Q         |         |         |         |
  0+40       1.5678     59.64  Q         |         |         |         |
```

```
16+30    2666.2537   5935.81  |          |      V   |Q         |          |
16+35    2708.1666   6085.75  |          |       V  | Q        |          |
16+40    2750.5676   6156.63  |          |       V  | Q        |          |
16+45    2794.0872   6319.04  |          |       V  |  Q       |          |
16+50    2838.2870   6417.81  |          |       V  |  Q       |          |
16+55    2883.4465   6557.15  |          |        V |   Q      |          |
17+ 0    2929.5741   6697.74  |          |        V |   Q      |          |
17+ 5    2976.7417   6848.73  |          |        V |    Q     |          |
17+10    3024.5618   6943.47  |          |         V|    Q     |          |
17+15    3072.9369   7024.06  |          |         V|     Q    |          |
17+20    3125.5851   7644.52  |          |         V|       Q  |          |
17+25    3179.9462   7893.23  |          |          V        Q|          |
17+30    3238.2607   8467.27  |          |          V         |Q         |
17+35    3298.2831   8715.26  |          |          V         | Q        |
17+40    3358.5177   8746.07  |          |          |V        | Q        |
17+45    3419.4066   8841.06  |          |          |V        | Q        |
17+50    3480.6789   8896.75  |          |          |V        | Q        |
17+55    3554.7386  10753.46  |          |          | V       |         Q|
18+ 0    3598.6728   6379.25  |          |          | VQ      |          |
18+ 5    3649.6647   7404.01  |          |          | V    Q  |          |
18+10    3702.6195   7689.04  |          |          |  V    Q  |          |
18+15    3756.3886   7807.28  |          |          |  V    Q  |          |
18+20    3807.5295   7425.66  |          |          |  V   Q   |          |
18+25    3856.6831   7137.09  |          |          |   V Q    |          |
18+30    3904.9705   7011.34  |          |          |   VQ     |          |
18+35    3951.9101   6815.62  |          |          |   VQ     |          |
18+40    3997.0016   6547.29  |          |          |   QV     |          |
18+45    4041.1202   6406.02  |          |          |  Q V     |          |
18+50    4084.2944   6268.90  |          |          |  Q V     |          |
18+55    4125.4041   5969.14  |          |          | Q  V     |          |
19+ 0    4165.4568   5815.65  |          |          |Q    V    |          |
19+ 5    4204.3606   5648.83  |          |         Q     V    |          |
19+10    4242.2294   5498.55  |          |         Q     V    |          |
19+15    4279.0429   5345.32  |          |        Q|     V    |          |
19+20    4315.0648   5230.38  |          |        Q|      V   |          |
19+25    4350.5141   5147.24  |          |        Q|      V   |          |
19+30    4385.3708   5061.18  |          |       Q |      V   |          |
19+35    4419.4795   4952.59  |          |       Q |      V   |          |
19+40    4452.8316   4842.72  |          |      Q  |       V  |          |
19+45    4485.6208   4761.00  |          |      Q  |       V  |          |
19+50    4517.6780   4654.71  |          |      Q  |       V  |          |
19+55    4549.2468   4583.79  |          |     Q   |       V  |          |
20+ 0    4580.2544   4502.30  |          |     Q   |       V  |          |
20+ 5    4610.6587   4414.71  |          |     Q   |        V|          |
20+10    4640.6183   4350.14  |          |     Q   |        V|          |
20+15    4670.0321   4270.87  |          |    Q    |        V|          |
20+20    4698.8070   4178.11  |          |    Q    |        V|          |
20+25    4727.1991   4122.54  |          |    Q    |        V|          |
20+30    4755.2185   4068.42  |          |    Q    |        V|          |
20+35    4782.7931   4003.83  |          |   Q     |         V          |
20+40    4809.9989   3950.28  |          |   Q     |         V          |
20+45    4836.8732   3902.15  |          |   Q     |         V          |
20+50    4863.4067   3852.66  |          |   Q     |         V          |
20+55    4889.5251   3792.40  |          |   Q     |         V          |
21+ 0    4915.3340   3747.45  |          |  Q      |         V          |
21+ 5    4940.8497   3704.88  |          |  Q      |         |V         |
21+10    4966.0178   3654.41  |          |  Q      |         |V         |
21+15    4990.6580   3577.75  |          |  Q      |         |V         |
21+20    5014.9874   3532.63  |          |  Q      |         |V         |
21+25    5039.0587   3495.16  |          | Q       |         |V         |
21+30    5062.8706   3457.49  |          | Q       |         |V         |
21+35    5086.3475   3408.84  |          | Q       |         | V        |
21+40    5109.3541   3340.57  |          | Q       |         | V        |
```

Big Sycamore Canyon Creek

Rational method calculation to determine time of concentration for unit hydrograph.

Node	Area (acres)		Cover Type	Soil Group								Average CN	F_p	Percent Impervious	F_m	F_m average	Flowpath Length (ft)	Elevation (ft)			Slope (ft/ft)	V (fps)	T_c (min)	I (in/hr)	Q (cfs)	Travel Time (min)
	Subarea	Total		A	CN	B	CN	C	CN	D	CN							Upstream	Downstream	Difference						
`5-0	14.9	15	Woodland, good							1	77	77.00	0.43	0%	0.43	0.43	825	4,800	4,460	340	0.41	4	16.5	2.31	25	n/a
`5-1a	22.8	38	Woodland, good							1	77	77.00	0.43	0%	0.43	0.43	700	4,460	4,300	160	0.23	4	19.4	2.14	58	2.9
`5-1b	53.7	91	Woodland, good							1	77	77.00	0.43	0%	0.43	0.43	700	4,300	4,200	100	0.14	4	22.0	2.02	130	2.6
`5-1c	28.4	120	Woodland, good							1	77	77.00	0.43	0%	0.43	0.43	450	4,200	4,160	40	0.09	4	23.8	1.94	163	1.8
`5-1d	54.2	174	Woodland, good							1	77	77.00	0.43	0%	0.43	0.43	500	4,160	4,120	40	0.08	4	25.8	1.87	225	1.9
`5-1	9.0	183	Woodland, good							1	77	77.00	0.43	0%	0.43	0.43	400	4,120	4,100	20	0.05	4	27.5	1.82	228	1.8
`5-2a	41.0	224	Woodland, good			0.5	55			0.5	77	66.00	0.61	0%	0.61	0.47	1,213	4,100	4,000	100	0.08	6	30.9	1.72	253	3.3
`5-2	106.4	330	Woodland, good			0.5	55			0.5	77	66.00	0.61	0%	0.61	0.51	1,450	4,000	3,900	100	0.07	6	34.8	1.63	331	3.9
`5-3a	635.0	965	Woodland, good			0.3	55	0.7	70			65.50	0.62	0%	0.62	0.58	1,560	3,900	3,800	100	0.06	8	38.1	1.56	848	3.4
`5-3	67.2	1,033	Woodland, good			0.3	55	0.7	70			65.50	0.62	0%	0.62	0.58	1,250	3,800	3,720	80	0.06	8	40.8	1.51	859	2.7
`5-4	607.7	1,640	Woodland, good			0.6	55	0.15	70	0.25	77	62.75	0.65	0%	0.65	0.61	2,545	3,720	3,580	140	0.06	10	45.2	1.44	1,220	4.4
`5-5a	71.7	1,712	Woodland, poor			1	66		77		83	66.00	0.61	0%	0.61	0.61	950	3,580	3,540	40	0.04	9	47.0	1.41	1,234	1.8
`5-5	110.2	1,822	Woodland, poor			1	66		77		83	66.00	0.61	0%	0.61	0.61	1,650	3,540	3,520	20	0.01	6	51.9	1.35	1,208	4.8
`5-6	131.7	1,954	Woodland, poor			1	66					66.00	0.61	0%	0.61	0.61	2,410	3,520	3,420	100	0.04	8	56.8	1.29	1,196	4.9
`5-7	225.0	2,179	Woodland, poor			1	66					66.00	0.61	0%	0.61	0.61	2,515	3,420	3,370	50	0.02	5	64.6	1.21	1,185	7.8
`5-8	148.8	2,328	Woodland, poor			0.85	66	0.15	77			67.65	0.58	0%	0.58	0.61	2,500	3,370	3,310	60	0.02	6	71.0	1.16	1,157	6.4
`5-9	141.6	2,469	chaparral, narrow	0.05	71	0.25	82	0.7	88		91	85.65	0.28	0%	0.28	0.59	2,505	3,310	3,225	85	0.03	6	77.7	1.11	1,161	6.7
`5-10	72.4	2,542	chaparral, narrow	0.6	71	0.3	82	0.1	88		91	76.00	0.45	0%	0.45	0.58	2,499	3,225	3,150	75	0.03	7	83.8	1.07	1,114	6.1
`5-11a	41.6	2,583	chaparral, narrow	0.5	71	0.5	82		88		91	76.50	0.44	0%	0.44	0.58	1,170	3,150	3,120	30	0.03	4	88.4	1.05	1,076	4.6
`5-11	30.2	2,613	chaparral, narrow	0.5	71	0.5	82		88		91	76.50	0.44	0%	0.44	0.58	1,356	3,120	3,090	30	0.02	4	94.1	1.01	1,020	5.7
`5-12a	6.8	2,620	chaparral, narrow	0.3	71	0.6	82	0.1	88		91	79.30	0.40	0%	0.40	0.58	741	3,090	3,080	10	0.01	3	97.8	1.00	981	3.7
`5-12	1,613.9	4,234	chaparral, narrow	0.3	71	0.6	82	0.1	88		91	79.30	0.40	0%	0.40	0.51	1,786	3,080	3,055	25	0.01	4	104.8	0.96	1,732	7.0
`5-13a	12.6	4,247	chaparral, narrow	1	71		82		88		91	71.00	0.53	0%	0.53	0.51	879	3,055	3,045	10	0.01	4	108.5	0.95	1,677	3.7
`5-13	44.6	4,291	chaparral, narrow	1	71		82		88		91	71.00	0.53	0%	0.53	0.51	1,526	3,045	3,025	20	0.01	4	114.8	0.92	1,597	6.3
`5-14a	343.7	4,635	chaparral, narrow	0.6	71	0.4	82		88		91	75.40	0.46	0%	0.46	0.51	1,200	3,025	3,020	5	0.00	3	121.7	0.90	1,634	6.9
`5-14	114.9	4,750	chaparral, narrow	0.6	71	0.4	82		88		91	75.40	0.46	0%	0.46	0.51	1,300	3,020	3,005	15	0.01	4	127.3	0.88	1,599	5.6

*Tc determined from Initial Subarea Nomograph

Big Sycamore Canyon Creek

Channel velocity calculations using Manning's equation to determine travel time.

Node	Channel Section	Flow Depth (ft)	Flow Area (sf)	Top Width	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Slope (ft/ft)	n	Velocity (ft/s)
`5-0	10	0.6	7	12	12.62	0.52	0.41	0.160	3.86
`5-1a	15	0.9	15	18	18.88	0.77	0.23	0.150	3.99
`5-1b	15	1.6	29	21	22.13	1.31	0.14	0.150	4.49
`5-1c	15	2.1	40	23	24.26	1.63	0.09	0.150	4.11
`5-1d	15	2.6	51	25	26.44	1.95	0.08	0.150	4.38
`5-1	15	2.9	61	27	28.09	2.17	0.05	0.150	3.73
`5-2a	15	2.2	42	24	24.65	1.69	0.08	0.100	6.07
`5-2	15	2.6	53	26	26.79	1.99	0.07	0.100	6.20
`5-3a	20	3.9	110	36	37.64	2.92	0.06	0.100	7.71
`5-3	20	4.0	111	36	37.77	2.94	0.06	0.100	7.74
`5-4	25	3.9	126	40	42.26	2.99	0.06	0.075	9.67
`5-5a	25	4.2	140	42	43.70	3.19	0.04	0.075	8.84
`5-5	25	5.8	213	48	51.00	4.18	0.01	0.075	5.67
`5-6	35	3.5	146	49	50.55	2.89	0.04	0.075	8.20
`5-7	70	2.9	220	82	83.01	2.66	0.02	0.075	5.37
`5-8	100	1.7	179	107	107.73	1.66	0.02	0.050	6.47
`5-9	150	1.2	187	155	155.49	1.20	0.03	0.050	6.21
`5-10	100	1.6	163	106	107.07	1.52	0.03	0.050	6.83
`5-11a	300	0.8	254	303	303.77	0.84	0.03	0.050	4.24
`5-11	300	0.9	257	303	303.81	0.85	0.02	0.050	3.97
`5-12a	300	1.0	292	304	304.32	0.96	0.01	0.050	3.36
`5-12	300	1.3	407	305	306.01	1.33	0.01	0.050	4.26
`5-13a	300	1.4	424	306	306.27	1.39	0.01	0.050	3.95
`5-13	300	1.3	395	305	305.83	1.29	0.01	0.050	4.04
`5-14a	300	1.9	566	307	308.34	1.84	0.00	0.050	2.89
`5-14	300	1.4	411	305	306.07	1.34	0.01	0.050	3.89

5.3.txt

```
        U n i t   H y d r o g r a p h   A n a l y s i s

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                Study date  05/10/17

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Kern County Synthetic Unit Hydrograph Hydrology Method
                Manual date - 1992


Program License Serial Number 6297

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-----------------------------------------------------------------

        BIG SYCAMORE CANYON CREEK

        Storm Event Year = 100

 English (in-lb) Input Units Used

 English Rainfall Data (Inches) Input Values Used

 English Units used in output format


RAINFALL DATA INPUT:
Slope of Intensity-Duration Curve Slope = 0.600

Zone Designation:       Desert Region   Latitude =  35.80

Area averaged rainfall intensity isohyetal data:
        Sub-Area        Duration        Isohyetal
        (Ac.)            (hours)         (In)
Rainfall data for year 2
          1640.00            6           1.50
           901.00            6           1.30
          2209.00            6           1.10
-----------------------------------------------------------------
Rainfall data for year 2
          1640.00           24           2.80
           901.00           24           2.50
          2209.00           24           2.00
-----------------------------------------------------------------
Rainfall data for year 100
          1640.00            6           3.70
           901.00            6           3.20
          2209.00            6           2.50
-----------------------------------------------------------------
Rainfall data for year 100
          1640.00           24           7.10
           901.00           24           6.20
          2209.00           24           5.00
-----------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
DESERT REGION area of study
Log-Log Rainfall Intensity Slope =  0.60
                                Page 1
```

5.3.txt

```
-----------------------------------------------------------------------

******** Area-averaged max loss rate, Fm ********


SCS curve     Area       Area       Fp      Ap        Fm
Number         (Ac.)    Fraction   (In/Hr)  (dec.)   (In/Hr)
 72.0       1640.00      0.345     0.518    1.000    0.518
 70.0        901.00      0.190     0.550    1.000    0.550
 76.0       2209.00      0.465     0.452    1.000    0.452

Area-averaged adjusted loss rate Fm (In/Hr) =  0.493

********* Area-Averaged low loss rate fraction, Yb **********

Area       Area          SCS CN        S     Pervious
 (Ac.)      Fract         (AMC2)             Yield Fr
  1640.00   0.345         72.0         3.89     0.496

   901.00   0.190         70.0         4.29     0.465

  2209.00   0.465         76.0         3.16     0.561

Area-averaged catchment yield fraction, Y =  0.520
Area-averaged low loss fraction, Yb =  0.480
User entry of time of concentration  =   2.121 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =    4750.00(Ac.)
Catchment Lag time =   1.697 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time =  4.9112
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.493(In/Hr)
Average low loss rate fraction (Yb) = 0.480 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall =  0.575(In)
Computed peak 30-minute rainfall =  1.177(In)
Specified peak 1-hour rainfall =  1.553(In)
Computed peak 3-hour rainfall =  2.348(In)
Specified peak 6-hour rainfall =  3.047(In)
Specified peak 24-hour rainfall =  5.953(In)


Rainfall depth area reduction factors:
Using a total area of    4750.00(Ac.) (Ref: fig. E-4)

5-minute factor = 0.793     Adjusted rainfall =  0.456(In)
30-minute factor = 0.793    Adjusted rainfall =  0.933(In)
1-hour factor = 0.793       Adjusted rainfall =  1.231(In)
3-hour factor = 0.968       Adjusted rainfall =  2.272(In)
6-hour factor = 0.984       Adjusted rainfall =  2.999(In)
24-hour factor = 0.990      Adjusted rainfall =  5.896(In)
-----------------------------------------------------------------------

                        U n i t  H y d r o g r a p h
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values             ((CFS))
-----------------------------------------------------------------------
                (K =     57445.31 (CFS))

  1                 0.273                  156.737
  2                 0.819                  313.473
```

```
240              0.0144           0.0069              0.0075
241              0.0142           0.0068              0.0074
242              0.0141           0.0067              0.0073
243              0.0139           0.0067              0.0072
244              0.0138           0.0066              0.0072
245              0.0136           0.0065              0.0071
246              0.0135           0.0065              0.0070
247              0.0134           0.0064              0.0070
248              0.0133           0.0064              0.0069
249              0.0131           0.0063              0.0068
250              0.0130           0.0062              0.0068
251              0.0129           0.0062              0.0067
252              0.0128           0.0061              0.0067
253              0.0127           0.0061              0.0066
254              0.0126           0.0060              0.0065
255              0.0125           0.0060              0.0065
256              0.0124           0.0059              0.0064
257              0.0123           0.0059              0.0064
258              0.0122           0.0058              0.0063
259              0.0121           0.0058              0.0063
260              0.0120           0.0057              0.0062
261              0.0119           0.0057              0.0062
262              0.0118           0.0057              0.0061
263              0.0117           0.0056              0.0061
264              0.0116           0.0056              0.0061
265              0.0116           0.0055              0.0060
266              0.0115           0.0055              0.0060
267              0.0114           0.0055              0.0059
268              0.0113           0.0054              0.0059
269              0.0112           0.0054              0.0058
270              0.0112           0.0054              0.0058
271              0.0111           0.0053              0.0058
272              0.0110           0.0053              0.0057
273              0.0109           0.0053              0.0057
274              0.0109           0.0052              0.0057
275              0.0108           0.0052              0.0056
276              0.0107           0.0052              0.0056
277              0.0107           0.0051              0.0056
278              0.0106           0.0051              0.0055
279              0.0106           0.0051              0.0055
280              0.0105           0.0050              0.0055
281              0.0104           0.0050              0.0054
282              0.0104           0.0050              0.0054
283              0.0103           0.0049              0.0054
284              0.0103           0.0049              0.0053
285              0.0102           0.0049              0.0053
286              0.0101           0.0049              0.0053
287              0.0101           0.0048              0.0052
288              0.0100           0.0048              0.0052
-----------------------------------------------------------------
                 5.8958           2.6113              3.2844
-----------------------------------------------------------------
-----------------------------------------------------------------
Total soil rain loss =      2.61(In)
Total effective rainfall =      3.28(In)
Peak flow rate in flood hydrograph =   3126.37(CFS)
--------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R    S T O R M
                R u n o f f      H y d r o g r a p h
-----------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))
```

```
15+35     464.0826    852.92 |          Q   V     |          |          |
15+40     470.1402    879.57 |          Q   V     |          |          |
15+45     476.3895    907.39 |          |Q  V     |          |          |
15+50     482.8315    935.38 |          |Q  V     |          |          |
15+55     489.5062    969.17 |          | Q  V    |          |          |
16+ 0     496.4809   1012.73 |          | Q  V    |          |          |
16+ 5     504.1410   1112.24 |          |  Q V    |          |          |
16+10     512.4290   1203.42 |          |    Q    |          |          |
16+15     520.9752   1240.91 |          |    QV   |          |          |
16+20     529.8116   1283.04 |          |     Q   |          |          |
16+25     539.2555   1371.26 |          |     VQ  |          |          |
16+30     549.0625   1423.98 |          |     VQ  |          |          |
16+35     559.4185   1503.69 |          |      VQ |          |          |
16+40     570.3435   1586.31 |          |      V Q|          |          |
16+45     581.9603   1686.76 |          |      V  |Q         |          |
16+50     594.4275   1810.24 |          |       V | Q        |          |
16+55     607.6764   1923.73 |          |       V |   Q      |          |
17+ 0     622.7025   2181.80 |          |        V|      Q   |          |
17+ 5     639.0973   2380.52 |          |        V|        Q|          |
17+10     657.4999   2672.06 |          |         V         |  Q       |
17+15     676.6543   2781.22 |          |         V         |   Q      |
17+20     695.8862   2792.47 |          |         |V        |   Q      |
17+25     717.4177   3126.37 |          |         | V       |        Q|
17+30     731.1297   1990.99 |          |         | V Q     |          |
17+35     744.8508   1992.29 |          |         | V Q     |          |
17+40     759.8725   2181.15 |          |         |  V   Q  |          |
17+45     774.4728   2119.97 |          |         |  V  Q   |          |
17+50     787.9021   1949.93 |          |         |   Q     |          |
17+55     800.8821   1884.69 |          |         |  QV     |          |
18+ 0     813.1202   1776.98 |          |         | Q  V    |          |
18+ 5     824.8665   1705.56 |          |         |Q   V    |          |
18+10     836.2731   1656.25 |          |        Q    V    |          |
18+15     847.0548   1565.49 |          |       Q|     V   |          |
18+20     857.1990   1472.94 |          |      Q |     V   |          |
18+25     866.7740   1390.29 |          |     Q  |     V   |          |
18+30     875.9691   1335.12 |          |    Q   |     V   |          |
18+35     884.9516   1304.27 |          |    Q   |      V  |          |
18+40     893.7190   1273.02 |          |   Q    |      V  |          |
18+45     902.1564   1225.11 |          |   Q    |      V  |          |
18+50     910.3408   1188.38 |          |  Q     |       V |          |
18+55     918.2438   1147.52 |          |  Q     |       V |          |
19+ 0     925.9597   1120.34 |          |  Q     |       V |          |
19+ 5     933.4468   1087.12 |          | Q      |       V |          |
19+10     940.7721   1063.64 |          | Q      |       V |          |
19+15     947.8632   1029.63 |          | Q      |        V|          |
19+20     954.7850   1005.05 |          | Q      |        V|          |
19+25     961.6269    993.44 |          | Q      |        V|          |
19+30     968.3147    971.07 |          | Q      |        V|          |
19+35     974.8965    955.68 |          |Q       |         V          |
19+40     981.3773    941.01 |          |Q       |         V          |
19+45     987.7287    922.22 |          |Q       |         V          |
19+50     993.9833    908.18 |          |Q       |         V          |
19+55    1000.1143    890.21 |          |Q       |         V          |
20+ 0    1006.0472    861.46 |          Q        |         V          |
20+ 5    1011.8860    847.80 |          Q        |         |V         |
20+10    1017.6390    835.34 |          Q        |         |V         |
20+15    1023.2495    814.64 |          Q        |         |V         |
20+20    1028.7053    792.18 |         Q|        |         |V         |
20+25    1034.0933    782.35 |         Q|        |         |V         |
20+30    1039.4153    772.75 |         Q|        |         |V         |
20+35    1044.6595    761.45 |         Q|        |         | V        |
20+40    1049.7829    743.93 |         Q|        |         | V        |
20+45    1054.8343    733.46 |         Q|        |         | V        |
```

Pescado Creek

Rational method calculation to determine time of concentration for unit hydrograph.

Node	Area (acres)		Cover Type	Soil Group								Average CN	F_p	Percent Impervious	F_m	F_m average	Flowpath Length (ft)	Elevation (ft)			Slope (ft/ft)	V (fps)	T_c (min)	I (in/hr)	Q (cfs)	Travel Time (min)
	Subarea	Total		A	CN	B	CN	C	CN	D	CN							Upstream	Downstream	Difference						
`6-1	1.6	2	woodland, good	1	30		55		70		77	30	0.90	0%	0.90	0.90	318	6,000	5,800	200	0.63	10	11	2.87	3	n/a
`6-2a	18.2	20	woodland, good	0.75	30		55		70	0.25	77	41.75	0.90	0%	0.90	0.90	780	5,800	5,400	400	0.51	4	13.5	2.55	29	2.97
`6-2b	28.4	48	woodland, good	0.75	30		55		70	0.25	77	41.75	0.90	0%	0.90	0.90	600	5,400	5,280	120	0.20	4	15.8	2.36	64	2.3
`6-2c	42.3	91	woodland, good	0.75	30		55		70	0.25	77	41.75	0.90	0%	0.90	0.90	650	5,280	5,160	120	0.18	5	18.0	2.22	108	2.2
`6-2	45.3	136	woodland, good	0.75	30		55		70	0.25	77	41.75	0.90	0%	0.90	0.90	850	5,160	5,040	120	0.14	5	20.8	2.07	143	2.9
`6-3a	121.8	258	woodland, good	0.5	30	0.1	55		70	0.4	77	51.3	0.80	0%	0.80	0.85	900	5,040	4,880	160	0.18	6	23.2	1.97	259	2.4
`6-3b	49.4	307	woodland, good	0.5	30	0.1	55		70	0.4	77	51.3	0.80	0%	0.80	0.84	800	4,880	4,800	80	0.10	5	25.7	1.88	285	2.5
`6-3	67.6	375	woodland, good	0.5	30	0.1	55		70	0.4	77	51.3	0.80	0%	0.80	0.84	900	4,800	4,700	100	0.11	6	28.4	1.79	322	2.6
`6-4a	208.9	584	woodland, good	0	30	0.85	55		70	0.15	77	58.3	0.71	0%	0.71	0.79	1,466	4,700	4,560	140	0.10	7	31.7	1.70	476	3.3
`6-4	134.9	718	woodland, good	0	30	0.85	55		70	0.15	77	58.3	0.71	0%	0.71	0.78	1,116	4,560	4,480	80	0.07	7	34.3	1.64	556	2.6
`6-5a	131.1	850	woodland, fair		36	1	60		73		79	60	0.69	0%	0.69	0.76	1,171	4,480	4,360	120	0.10	8	36.8	1.58	626	2.5
`6-5	109.9	959	woodland, fair		36	1	60		73		79	60	0.69	0%	0.69	0.76	1,399	4,360	4,240	120	0.09	8	39.8	1.53	664	3.0
`6-6a	59.2	1,019	woodland, fair	0.1	36	0.9	60		73		79	57.6	0.72	0%	0.72	0.75	1,100	4,240	4,160	80	0.07	7	42.6	1.48	663	2.8
`6-6b	53.6	1,072	woodland, fair	0.1	36	0.9	60		73		79	57.6	0.72	0%	0.72	0.75	842	4,160	4,120	40	0.05	6	45.0	1.44	662	2.4
`6-6	60.0	1,132	woodland, fair	0.1	36	0.9	60		73		79	57.6	0.72	0%	0.72	0.75	1,246	4,120	4,040	80	0.06	6	48.3	1.39	653	3.3
`6-7	828.9	1,961	woodland, fair		36	0.25	60	0.6	73	0.15	79	70.65	0.54	0%	0.54	0.66	2,713	4,040	3,840	200	0.07	10	52.8	1.33	1,189	4.5
`6-8	137.4	2,098	chaparral, narrow		71	0.3	82	0.7	88		91	86.2	0.27	0%	0.27	0.64	2,618	3,840	3,750	90	0.03	7	58.9	1.27	1,193	6.1
`6-9	80.8	2,179	chaparral, narrow	0.5	71	0.5	82		88		91	76.5	0.44	0%	0.44	0.63	2,593	3,750	3,570	180	0.07	8	64.5	1.21	1,148	5.6
`6-10	75.5	2,255	chaparral, narrow		71	0.15	82	0.7	88	0.15	91	87.55	0.24	0%	0.24	0.62	2,645	3,570	3,420	150	0.06	6	71.6	1.16	1,095	7.1
`6-11a	8.3	2,263	woodland, fair			0.3	60	0.7	73			69.1	0.56	0%	0.56	0.62	655	3,420	3,400	20	0.03	3	74.8	1.13	1,051	3.2
`6-11	1,914.8	4,178	woodland, fair			0.3	60	0.7	73			69.1	0.56	0%	0.56	0.59	2,111	3,400	3,320	80	0.04	4	82.7	1.08	1,835	7.9
`6-12	123.7	4,302	chaparral, narrow		71	0.75	82	0.15	88	0.1	91	83.8	0.31	0%	0.31	0.58	2,480	3,320	3,270	50	0.02	7	88.4	1.05	1,790	5.7
`6-13	41.1	4,343	chaparral, narrow		71	1	82		88		91	82	0.35	0%	0.35	0.58	2,555	3,270	3,205	65	0.03	5	97.7	1.00	1,626	9.3
`6-14	143.5	4,486	chaparral, narrow	0.05	71	0.95	82		88		91	81.45	0.36	0%	0.36	0.57	2,839	3,205	3,150	55	0.02	6	106.3	0.96	1,552	8.6
`6-15	1,025.8	5,512	chaparral, narrow	0.05	71	0.75	82	0.2	88		91	82.65	0.34	1%	0.33	0.53	2,558	3,150	3,100	50	0.02	7	112.7	0.93	1,999	6.4
`6-16	126.8	5,639	chaparral, narrow	0.45	71	0.55	82		88		91	77.05	0.43	0%	0.43	0.53	2,611	3,100	3,045	55	0.02	7	119.1	0.91	1,933	6.5
`6-17	110.3	5,749	chaparral, narrow	0.65	71	0.35	82		88		91	74.85	0.47	0%	0.47	0.53	2,501	3,045	2,995	50	0.02	7	125.5	0.89	1,862	6.4
`6-18	2,199.1	7,948	chaparral, narrow	0.15	71	0.7	82	0.15	88		91	81.25	0.36	1%	0.36	0.48	2,429	2,995	2,965	30	0.01	6	131.9	0.86	2,759	6.4

*Tc determined from Initial Subarea Nomograph

Pescado Creek

Channel velocity calculations using Manning's equation to determine travel time.

Node	Channel Section	Flow Depth (ft)	Flow Area (sf)	Top Width	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Slope (ft/ft)	n	Velocity (ft/s)
`6-1	10	0.1	1	11	10.61	0.13	0.63	0.150	2.03
`6-2a	10	0.6	7	12	12.69	0.53	0.51	0.160	4.37
`6-2b	10	1.2	15	15	15.31	0.96	0.20	0.150	4.32
`6-2c	10	1.6	22	17	17.32	1.25	0.18	0.150	4.96
`6-2	10	2.1	29	18	19.22	1.51	0.14	0.150	4.92
`6-3a	10	2.7	41	21	21.91	1.86	0.18	0.150	6.34
`6-3b	10	3.3	54	23	24.57	2.19	0.10	0.150	5.30
`6-3	10	3.4	57	24	25.10	2.25	0.11	0.150	5.69
`6-4a	35	1.7	65	42	42.56	1.52	0.10	0.083	7.35
`6-4	35	2.0	77	43	43.81	1.75	0.07	0.080	7.25
`6-5a	40	1.9	82	47	48.34	1.69	0.10	0.088	7.68
`6-5	40	1.9	85	48	48.67	1.75	0.09	0.081	7.81
`6-6a	60	1.6	101	66	67.13	1.50	0.07	0.080	6.58
`6-6b	60	1.8	115	67	68.09	1.69	0.05	0.080	5.76
`6-6	60	1.6	104	67	67.33	1.54	0.06	0.080	6.29
`6-7	25	3.6	117	40	41.24	2.84	0.07	0.080	10.14
`6-8	40	3.5	167	54	55.83	2.99	0.03	0.080	7.16
`6-9	40	3.2	149	53	54.37	2.74	0.07	0.100	7.69
`6-10	65	2.5	176	75	76.27	2.31	0.06	0.100	6.21
`6-11a	100	2.9	309	112	113.07	2.74	0.03	0.150	3.40
`6-11	100	3.8	411	115	117.07	3.51	0.04	0.150	4.47
`6-12	70	3.2	248	83	84.49	2.93	0.02	0.060	7.22
`6-13	280	1.3	355	285	285.62	1.24	0.03	0.060	4.58
`6-14	130	2.1	281	138	139.37	2.02	0.02	0.060	5.52
`6-15	100	2.8	300	111	112.69	2.66	0.02	0.060	6.67
`6-16	100	2.7	287	111	112.16	2.56	0.02	0.060	6.74
`6-17	100	2.7	285	111	112.08	2.54	0.02	0.060	6.54
`6-18	110	3.7	437	125	126.66	3.45	0.01	0.060	6.31

6.3.txt

```
        U n i t   H y d r o g r a p h   A n a l y s i s

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                Study date  05/10/17

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Kern County Synthetic Unit Hydrograph Hydrology Method
                Manual date - 1992


Program License Serial Number 6297

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        PESCADO CREEK

        Storm Event Year = 100

 English (in-lb) Input Units Used

 English Rainfall Data (Inches) Input Values Used

 English Units used in output format


RAINFALL DATA INPUT:
Slope of Intensity-Duration Curve Slope = 0.600

Zone Designation:       Desert Region   Latitude =  34.80

Area averaged rainfall intensity isohyetal data:
        Sub-Area        Duration        Isohyetal
        (Ac.)            (hours)         (In)
Rainfall data for year 2
          2179.00            6           1.50
          2307.00            6           1.30
          3462.00            6           1.10
-----------------------------------------------------------------------
Rainfall data for year 2
          2179.00           24           2.80
          2307.00           24           2.50
          3462.00           24           2.00
-----------------------------------------------------------------------
Rainfall data for year 100
          2179.00            6           3.70
          2307.00            6           3.20
          3462.00            6           2.50
-----------------------------------------------------------------------
Rainfall data for year 100
          2179.00           24           7.10
          2307.00           24           6.20
          3462.00           24           5.00
-----------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
DESERT REGION area of study
Log-Log Rainfall Intensity Slope =  0.60
                                Page 1
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6.3.txt

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-----------------------------------------------------------------------

******** Area-averaged max loss rate, Fm ********


SCS curve     Area       Area       Fp      Ap        Fm
Number         (Ac.)    Fraction   (In/Hr)  (dec.)   (In/Hr)
 55.0       2179.00      0.274     0.760    1.000    0.760
 79.0       2307.00      0.290     0.398    1.000    0.398
 79.0       3462.00      0.436     0.398    1.000    0.398

Area-averaged adjusted loss rate Fm (In/Hr) =  0.497

********* Area-Averaged low loss rate fraction, Yb **********

Area       Area          SCS CN        S     Pervious
 (Ac.)      Fract         (AMC2)             Yield Fr
  2179.00   0.274         55.0         8.18     0.249

  2307.00   0.290         79.0         2.66     0.610

  3462.00   0.436         79.0         2.66     0.610

Area-averaged catchment yield fraction, Y =  0.511
Area-averaged low loss fraction, Yb =  0.489
User entry of time of concentration  =   2.199 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =    7948.00(Ac.)
Catchment Lag time =   1.759 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time =  4.7370
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.497(In/Hr)
Average low loss rate fraction (Yb) = 0.489 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall =  0.572(In)
Computed peak 30-minute rainfall =  1.172(In)
Specified peak 1-hour rainfall =  1.547(In)
Computed peak 3-hour rainfall =  2.337(In)
Specified peak 6-hour rainfall =  3.032(In)
Specified peak 24-hour rainfall =  5.924(In)


Rainfall depth area reduction factors:
Using a total area of    7948.00(Ac.) (Ref: fig. E-4)

5-minute factor = 0.710     Adjusted rainfall =  0.406(In)
30-minute factor = 0.710    Adjusted rainfall =  0.832(In)
1-hour factor = 0.710       Adjusted rainfall =  1.098(In)
3-hour factor = 0.943       Adjusted rainfall =  2.203(In)
6-hour factor = 0.974       Adjusted rainfall =  2.954(In)
24-hour factor = 0.984      Adjusted rainfall =  5.828(In)
-----------------------------------------------------------------------

                        U n i t  H y d r o g r a p h
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values             ((CFS))
-----------------------------------------------------------------------
                (K =     96121.12 (CFS))

  1                 0.263                  252.959
  2                 0.790                  505.918
```

6.3.txt

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24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 1200.0 2400.0 3600.0 4800.0
0+ 5	0.0088	1.28	Q | | | |
0+10	0.0354	3.85	Q | | | |
0+15	0.0796	6.43	Q | | | |
0+20	0.1419	9.04	Q | | | |
0+25	0.2296	12.74	Q | | | |
0+30	0.3465	16.97	Q | | | |
0+35	0.4967	21.82	Q | | | |
0+40	0.6873	27.67	Q | | | |
0+45	0.9270	34.81	Q | | | |
0+50	1.2249	43.25	Q | | | |
0+55	1.5871	52.59	Q | | | |
1+ 0	2.0278	64.00	Q | | | |
1+ 5	2.5750	79.45	Q | | | |
1+10	3.2517	98.25	Q | | | |
1+15	4.0889	121.57	VQ | | | |
1+20	5.0874	144.98	VQ | | | |
1+25	6.2472	168.41	VQ | | | |
1+30	7.6712	206.76	VQ | | | |
1+35	9.1068	208.44	VQ | | | |
1+40	10.6388	222.46	VQ | | | |
1+45	12.2810	238.43	VQ | | | |
1+50	14.0233	252.98	V Q | | | |
1+55	15.8499	265.22	V Q | | | |
2+ 0	17.7602	277.38	V Q | | | |
2+ 5	19.7425	287.84	V Q | | | |
2+10	21.7942	297.90	V Q | | | |
2+15	23.9149	307.92	V Q | | | |
2+20	26.0982	317.02	V Q | | | |
2+25	28.3373	325.11	V Q | | | |
2+30	30.6278	332.58	V Q | | | |
2+35	32.9652	339.40	V Q | | | |
2+40	35.3494	346.18	V Q | | | |
2+45	37.7799	352.91	V Q | | | |
2+50	40.2550	359.37	V Q | | | |
2+55	42.7723	365.51	V Q | | | |
3+ 0	45.3302	371.41	V Q | | | |
3+ 5	47.9271	377.08	V Q | | | |
3+10	50.5622	382.61	V Q | | | |
3+15	53.2337	387.91	|V Q | | | |
3+20	55.9412	393.12	|V Q | | | |
3+25	58.6811	397.84	|V Q | | | |
3+30	61.4539	402.62	|V Q | | | |
3+35	64.2585	407.23	|V Q | | | |
3+40	67.0946	411.79	|V Q | | | |
3+45	69.9618	416.32	|V Q | | | |
3+50	72.8599	420.81	|V Q | | | |
3+55	75.7879	425.15	|V Q | | | |
4+ 0	78.7464	429.58	|V Q | | | |
4+ 5	81.7338	433.77	|V Q | | | |
4+10	84.7485	437.73	|V Q | | | |
4+15	87.7900	441.64	|V Q | | | |
4+20	90.8591	445.63	|V Q | | | |
4+25	93.9536	449.32	|V Q | | | |
4+30	97.0727	452.89	|V Q | | | |

6.3.txt

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15+ 5     700.6853   1160.31 |         Q|  V      |         |         |
15+10     708.9755   1203.73 |          Q  V      |         |         |
15+15     717.6069   1253.28 |          Q  V      |         |         |
15+20     726.5957   1305.18 |          Q  V      |         |         |
15+25     735.9263   1354.80 |          |Q  V     |         |         |
15+30     745.7320   1423.79 |          |Q  V     |         |         |
15+35     755.6886   1445.70 |          | Q V     |         |         |
15+40     765.9309   1487.18 |          | Q V     |         |         |
15+45     776.4738   1530.82 |          | Q V     |         |         |
15+50     787.3317   1576.57 |          |  Q V    |         |         |
15+55     798.5193   1624.45 |          |  Q V    |         |         |
16+ 0     810.1420   1687.61 |          |   QV    |         |         |
16+ 5     822.7199   1826.31 |          |    Q    |         |         |
16+10     836.1833   1954.88 |          |    VQ   |         |         |
16+15     849.9704   2001.89 |          |     Q   |         |         |
16+20     864.1308   2056.08 |          |     VQ  |         |         |
16+25     879.0451   2165.57 |          |     V Q |         |         |
16+30     894.4918   2242.85 |          |      VQ |         |         |
16+35     910.4634   2319.07 |          |      V Q|         |         |
16+40     927.1907   2428.81 |          |      V  Q         |         |
16+45     944.8088   2558.15 |          |       V |Q        |         |
16+50     963.1570   2664.16 |          |       V | Q       |         |
16+55     982.7030   2838.07 |          |       V |  Q      |         |
17+ 0    1003.9325   3082.53 |          |        V|    Q    |         |
17+ 5    1027.5794   3433.53 |          |        V|       Q |         |
17+10    1053.3432   3740.91 |          |         V         |Q        |
17+15    1081.2320   4049.46 |          |         V         |  Q      |
17+20    1109.4714   4100.36 |          |         |V        |   Q     |
17+25    1137.7782   4110.14 |          |         |V        |   Q     |
17+30    1170.2666   4717.32 |          |         | V       |         Q|
17+35    1187.1772   2455.42 |          |         Q V       |         |
17+40    1209.1231   3186.54 |          |         |  V  Q   |         |
17+45    1231.7312   3282.69 |          |         |  V   Q  |         |
17+50    1253.6187   3178.06 |          |         |  V  Q   |         |
17+55    1273.9525   2952.47 |          |         |   Q     |         |
18+ 0    1293.7556   2875.42 |          |         |  QV     |         |
18+ 5    1312.4657   2716.71 |          |         | Q  V    |         |
18+10    1330.5790   2630.05 |          |         |Q   V    |         |
18+15    1348.1798   2555.64 |          |         |Q   V    |         |
18+20    1364.8577   2421.62 |          |         Q     V   |         |
18+25    1380.6296   2290.08 |          |        Q|     V   |         |
18+30    1395.5085   2160.41 |          |       Q |     V   |         |
18+35    1409.9258   2093.40 |          |      Q  |     V   |         |
18+40    1424.0000   2043.56 |          |      Q  |      V  |         |
18+45    1437.7587   1997.77 |          |     Q   |      V  |         |
18+50    1451.0617   1931.60 |          |     Q   |      V  |         |
18+55    1463.9619   1873.11 |          |    Q    |      V  |         |
19+ 0    1476.4636   1815.25 |          |    Q    |       V |         |
19+ 5    1488.6607   1771.01 |          |   Q     |       V |         |
19+10    1500.5490   1726.18 |          |   Q     |       V |         |
19+15    1512.1555   1685.26 |          |   Q     |       V |         |
19+20    1523.4872   1645.37 |          |  Q      |        V|         |
19+25    1534.4658   1594.09 |          |  Q      |        V|         |
19+30    1545.3156   1575.40 |          |  Q      |        V|         |
19+35    1555.9373   1542.27 |          | Q       |        V|         |
19+40    1566.3626   1513.76 |          | Q       |        V|         |
19+45    1576.6461   1493.16 |          | Q       |         V         |
19+50    1586.7440   1466.22 |          | Q       |         V         |
19+55    1596.6636   1440.32 |          | Q       |         V         |
20+ 0    1606.4378   1419.21 |          |Q        |         V         |
20+ 5    1615.9808   1385.65 |          |Q        |         V         |
20+10    1625.2628   1347.75 |          |Q        |         |V        |
20+15    1634.4204   1329.68 |          |Q        |         |V        |
```

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Antelope Canyon Creek

Rational method calculation to determine time of concentration for unit hydrograph.

Node	Area (acres)		Cover Type	Soil Group								Average CN	F_p	Percent Impervious	F_m	F_m average	Flowpath Length (ft)	Elevation (ft)			Slope (ft/ft)	V (fps)	T_c (min)	I (in/hr)	Q (cfs)	Travel Time (min)
	Subarea	Total		A	CN	B	CN	C	CN	D	CN							Upstream	Downstream	Difference						
`7-1	2.5	2	woodland, good		30	1	55		70		77	55.00	0.76	0%	0.76	0.76	383	4,800	4,760	40	0.10	1	14	2.50	4	n/a
`7-2a	36.3	39	woodland, fair	0.2	36	0.7	60		73	0.1	79	57.10	0.73	0%	0.73	0.73	752	4,760	4,600	160	0.21	4	17.0	2.28	54	3.0
`7-2b	74.8	114	woodland, fair	0.2	36	0.7	60		73	0.1	79	57.10	0.73	0%	0.73	0.73	470	4,600	4,540	60	0.13	5	18.6	2.19	149	1.6
`7-2c	127.5	241	woodland, fair	0.2	36	0.7	60		73	0.1	79	57.10	0.73	0%	0.73	0.73	765	4,540	4,480	60	0.08	5	21.2	2.05	287	2.6
`7-2d	27.1	268	woodland, fair	0.2	36	0.7	60		73	0.1	79	57.10	0.73	0%	0.73	0.73	402	4,480	4,440	40	0.10	5	22.5	2.00	306	1.2
`7-2	76.1	344	woodland, fair	0.2	36	0.7	60		73	0.1	79	57.10	0.73	0%	0.73	0.73	596	4,440	4,370	70	0.12	6	24.1	1.93	373	1.6
`7-3a	53.0	397	woodland, fair		36	1	60		73		79	60.00	0.69	0%	0.69	0.72	680	4,370	4,280	90	0.13	8	25.6	1.88	413	1.5
`7-3b	40.1	437	woodland, fair		36	1	60		73		79	60.00	0.69	0%	0.69	0.72	799	4,280	4,200	80	0.10	7	27.4	1.82	433	1.8
`7-3	30.5	468	woodland, fair		36	1	60		73		79	60.00	0.69	0%	0.69	0.72	1,026	4,200	4,100	100	0.10	7	29.7	1.75	435	2.3
`7-4a	47.7	516	woodland, fair		36	0.8	60	0.2	73		79	62.60	0.66	0%	0.66	0.71	900	4,100	4,040	60	0.07	7	32.0	1.69	454	2.3
`7-4b	21.9	537	woodland, fair		36	0.8	60	0.2	73		79	62.60	0.66	0%	0.66	0.71	750	4,040	4,000	40	0.05	6	34.0	1.64	451	2.0
`7-4	43.0	580	woodland, fair		36	0.8	60	0.2	73		79	62.60	0.66	0%	0.66	0.71	913	4,000	3,920	80	0.09	7	36.1	1.60	465	2.1
`7-5a	10.9	591	woodland, fair		36	0.5	60	0.5	73		79	66.50	0.60	0%	0.60	0.71	728	3,920	3,880	40	0.05	7	37.9	1.56	455	1.8
`7-5b	14.9	606	woodland, fair		36	0.5	60	0.5	73		79	66.50	0.60	0%	0.60	0.70	737	3,880	3,820	60	0.08	7	39.6	1.53	451	1.7
`7-5	8.4	615	woodland, fair		36	0.5	60	0.5	73		79	66.50	0.60	0%	0.60	0.70	1,087	3,820	3,760	60	0.06	7	42.3	1.48	431	2.7
`7-6a	28.1	643	chaparral, narrow		71		82	1	88		91	88.00	0.24	0%	0.24	0.68	1,112	3,760	3,700	60	0.05	5	46.4	1.42	427	4.0
`7-6b	5.6	648	chaparral, narrow		71		82	1	88		91	88.00	0.24	0%	0.24	0.68	606	3,700	3,655	45	0.07	5	48.4	1.39	416	2.0
`7-6	8.7	657	chaparral, narrow		71		82	1	88		91	88.00	0.24	0%	0.24	0.67	950	3,655	3,610	45	0.05	4	52.1	1.34	397	3.7
`7-7a	497.4	1,155	chaparral, narrow		71	0.55	82	0.45	88		91	84.70	0.30	0%	0.30	0.51	1,357	3,610	3,530	80	0.06	5	56.3	1.29	814	4.2
`7-7	345.8	1,500	chaparral, narrow		71	0.55	82	0.45	88		91	84.70	0.30	0%	0.30	0.46	1,357	3,530	3,470	60	0.04	5	60.5	1.25	1,066	4.2
`7-8a	32.4	1,533	chaparral, narrow	1	71		82		88		91	71.00	0.53	0%	0.53	0.46	1,400	3,470	3,400	70	0.05	5	65.0	1.21	1,029	4.5
`7-8	31.6	1,564	chaparral, narrow	1	71		82		88		91	71.00	0.53	0%	0.53	0.46	1,170	3,400	3,355	45	0.04	5	69.1	1.17	1,000	4.1
`7-9	1,176.5	2,741	chaparral, narrow	0.4	71	0.3	82	0.3	88		91	79.40	0.39	0%	0.39	0.43	2,691	3,355	3,270	85	0.03	10	73.4	1.14	1,744	4.4
`7-10	198.2	2,939	chaparral, narrow	1	71		82		88		91	71.00	0.53	0%	0.53	0.44	2,504	3,270	3,200	70	0.03	10	77.4	1.11	1,778	4.0
`7-11	69.5	3,009	chaparral, narrow	1	71		82		88		91	71.00	0.53	0%	0.53	0.44	2,511	3,200	3,130	70	0.03	10	81.5	1.09	1,742	4.0
`7-12	59.3	3,068	chaparral, narrow	0.55	71	0.45	82		88		91	75.95	0.45	0%	0.45	0.44	2,501	3,130	3,075	55	0.02	6	87.9	1.05	1,670	6.4
`7-13a	23.4	3,091	chaparral, narrow	0.5	71	0.5	82		88		91	76.50	0.44	0%	0.44	0.44	1,300	3,075	3,050	25	0.02	5	92.5	1.02	1,614	4.5
`7-13	19.4	3,111	chaparral, narrow	0.5	71	0.5	82		88		91	76.50	0.44	0%	0.44	0.44	1,223	3,050	3,030	20	0.02	4	97.0	1.00	1,559	4.5
`7-14a	15.6	3,126	chaparral, narrow		71	1	82		88		91	82.00	0.35	0%	0.35	0.44	1,148	3,030	3,000	30	0.03	4	101.4	0.98	1,510	4.4
`7-14	16.2	3,143	chaparral, narrow		71	1	82		88		91	82.00	0.35	0%	0.35	0.44	1,352	3,000	2,975	25	0.02	4	107.2	0.95	1,447	5.8
`7-15	1,146.7	4,289	chaparral, narrow	0.2	71	0.8	82		88		91	79.80	0.39	0%	0.39	0.43	853	2,975	2,955	20	0.02	5	110.2	0.94	1,984	3.0

*Tc determined from Initial Subarea Nomograph

Antelope Canyon Creek

Channel velocity calculations using Manning's equation to determine travel time.

Node	Channel Section	Flow Depth (ft)	Flow Area (sf)	Top Width	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Slope (ft/ft)	n	Velocity (ft/s)
`7-1	10	0.3	3	11	11.33	0.28	0.10	0.150	1.37
`7-2a	10	1.1	13	14	14.76	0.88	0.21	0.150	4.19
`7-2b	10	2.2	31	19	19.67	1.58	0.13	0.150	4.80
`7-2c	10	3.5	59	24	25.57	2.31	0.08	0.150	4.86
`7-2d	10	3.4	57	24	25.14	2.26	0.10	0.150	5.39
`7-2	10	3.6	62	24	26.06	2.37	0.12	0.150	6.05
`7-3a	25	1.9	53	32	33.32	1.60	0.13	0.096	7.73
`7-3b	25	2.0	58	33	33.93	1.71	0.10	0.090	7.48
`7-3	25	2.0	59	33	34.02	1.72	0.10	0.090	7.43
`7-4a	35	1.8	69	42	42.99	1.60	0.07	0.080	6.59
`7-4b	35	1.9	74	43	43.50	1.69	0.05	0.080	6.11
`7-4	35	1.7	64	42	42.48	1.51	0.09	0.080	7.25
`7-5a	35	1.8	67	42	42.83	1.57	0.05	0.070	6.75
`7-5b	35	1.6	63	42	42.33	1.48	0.08	0.077	7.18
`7-5	35	1.7	65	42	42.58	1.53	0.06	0.070	6.63
`7-6a	100	0.9	93	104	104.09	0.89	0.05	0.070	4.59
`7-6b	100	0.8	83	103	103.66	0.80	0.07	0.070	5.01
`7-6	100	0.9	93	104	104.07	0.89	0.05	0.070	4.29
`7-7a	125	1.2	152	130	130.34	1.17	0.06	0.075	5.35
`7-7	125	1.5	196	131	131.84	1.49	0.04	0.075	5.44
`7-8a	150	1.3	198	155	155.79	1.27	0.05	0.075	5.21
`7-8	150	1.4	210	156	156.16	1.35	0.04	0.075	4.75
`7-9	15	6.2	170	40	42.78	3.98	0.03	0.065	10.24
`7-10	15	6.2	170	40	42.78	3.98	0.03	0.060	10.43
`7-11	15	6.2	168	40	42.52	3.95	0.03	0.060	10.37
`7-12	100	2.5	258	110	111.01	2.33	0.02	0.060	6.47
`7-13a	200	1.7	338	207	207.44	1.63	0.02	0.060	4.77
`7-13	200	1.7	348	207	207.65	1.68	0.02	0.060	4.48
`7-14a	300	1.1	346	305	305.12	1.13	0.03	0.060	4.37
`7-14	300	1.2	374	305	305.53	1.23	0.02	0.060	3.87
`7-15	300	1.4	422	306	306.23	1.38	0.02	0.060	4.71

7.3.txt

```
        U n i t   H y d r o g r a p h   A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 2004-2012, Version 7.1

                Study date  05/10/17

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Kern County Synthetic Unit Hydrograph Hydrology Method
                Manual date - 1992


Program License Serial Number 6297

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-----------------------------------------------------------------------

        ANTELOPE CANYON CREEK

        Storm Event Year = 100

 English (in-lb) Input Units Used

 English Rainfall Data (Inches) Input Values Used

 English Units used in output format


RAINFALL DATA INPUT:
Slope of Intensity-Duration Curve Slope = 0.600

Zone Designation:       Desert Region   Latitude =  34.80

Area averaged rainfall intensity isohyetal data:
        Sub-Area        Duration        Isohyetal
        (Ac.)            (hours)         (In)
Rainfall data for year 2
          1155.00            6           1.50
          1854.00            6           1.30
          1280.00            6           1.10
-----------------------------------------------------------------------
Rainfall data for year 2
          1155.00           24           2.80
          1854.00           24           2.50
          1280.00           24           2.00
-----------------------------------------------------------------------
Rainfall data for year 100
          1155.00            6           3.70
          1854.00            6           3.20
          1280.00            6           2.50
-----------------------------------------------------------------------
Rainfall data for year 100
          1155.00           24           7.10
          1854.00           24           6.20
          1280.00           24           5.00
-----------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
DESERT REGION area of study
Log-Log Rainfall Intensity Slope =  0.60
```

```
-----------------------------------------------------------------------

******** Area-averaged max loss rate, Fm ********


SCS curve     Area       Area       Fp      Ap        Fm
Number         (Ac.)    Fraction   (In/Hr)  (dec.)   (In/Hr)
 79.0       1155.00      0.269     0.398    1.000    0.398
 75.0       1854.00      0.432     0.470    1.000    0.470
 79.0       1280.00      0.298     0.398    1.000    0.398

Area-averaged adjusted loss rate Fm (In/Hr) =  0.429

********* Area-Averaged low loss rate fraction, Yb **********

Area       Area          SCS CN        S     Pervious
 (Ac.)      Fract         (AMC2)             Yield Fr
  1155.00   0.269         79.0         2.66     0.617

  1854.00   0.432         75.0         3.33     0.551

  1280.00   0.298         79.0         2.66     0.617

Area-averaged catchment yield fraction, Y =  0.589
Area-averaged low loss fraction, Yb =  0.411
User entry of time of concentration  =   1.837 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =    4289.00(Ac.)
Catchment Lag time =   1.470 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time =  5.6705
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.429(In/Hr)
Average low loss rate fraction (Yb) = 0.411 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall =  0.588(In)
Computed peak 30-minute rainfall =  1.204(In)
Specified peak 1-hour rainfall =  1.589(In)
Computed peak 3-hour rainfall =  2.406(In)
Specified peak 6-hour rainfall =  3.126(In)
Specified peak 24-hour rainfall =  6.084(In)


Rainfall depth area reduction factors:
Using a total area of    4289.00(Ac.) (Ref: fig. E-4)

5-minute factor = 0.809     Adjusted rainfall =  0.475(In)
30-minute factor = 0.809    Adjusted rainfall =  0.974(In)
1-hour factor = 0.809       Adjusted rainfall =  1.285(In)
3-hour factor = 0.971       Adjusted rainfall =  2.337(In)
6-hour factor = 0.986       Adjusted rainfall =  3.081(In)
24-hour factor = 0.991      Adjusted rainfall =  6.032(In)
-----------------------------------------------------------------------

                        U n i t  H y d r o g r a p h
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values             ((CFS))
-----------------------------------------------------------------------
                (K =     51870.09 (CFS))

  1                 0.315                  163.405
  2                 0.945                  326.809
```

```
      261              0.0121           0.0050              0.0071
      262              0.0120           0.0049              0.0071
      263              0.0119           0.0049              0.0070
      264              0.0118           0.0049              0.0070
      265              0.0118           0.0048              0.0069
      266              0.0117           0.0048              0.0069
      267              0.0116           0.0048              0.0068
      268              0.0115           0.0047              0.0068
      269              0.0114           0.0047              0.0067
      270              0.0114           0.0047              0.0067
      271              0.0113           0.0046              0.0066
      272              0.0112           0.0046              0.0066
      273              0.0111           0.0046              0.0066
      274              0.0111           0.0046              0.0065
      275              0.0110           0.0045              0.0065
      276              0.0109           0.0045              0.0064
      277              0.0109           0.0045              0.0064
      278              0.0108           0.0044              0.0064
      279              0.0107           0.0044              0.0063
      280              0.0107           0.0044              0.0063
      281              0.0106           0.0044              0.0062
      282              0.0105           0.0043              0.0062
      283              0.0105           0.0043              0.0062
      284              0.0104           0.0043              0.0061
      285              0.0104           0.0043              0.0061
      286              0.0103           0.0042              0.0061
      287              0.0103           0.0042              0.0060
      288              0.0102           0.0042              0.0060
      ---------------------------------------------------------------------
                       6.0318           2.2836              3.7482
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Total soil rain loss =      2.28(In)
      Total effective rainfall =      3.75(In)
      Peak flow rate in flood hydrograph =   3331.14(CFS)
      ----------------------------------------------------------------------
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         24 - H O U R    S T O R M
                   R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                 Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0      850.0    1700.0    2550.0    3400.0
-------------------------------------------------------------------------
  0+ 5       0.0067      0.98  Q         |         |         |         |
  0+10       0.0269      2.93  Q         |         |         |         |
  0+15       0.0606      4.89  Q         |         |         |         |
  0+20       0.1108      7.29  Q         |         |         |         |
  0+25       0.1830     10.48  Q         |         |         |         |
  0+30       0.2807     14.18  Q         |         |         |         |
  0+35       0.4100     18.77  Q         |         |         |         |
  0+40       0.5793     24.58  Q         |         |         |         |
  0+45       0.7961     31.48  Q         |         |         |         |
  0+50       1.0688     39.60  Q         |         |         |         |
  0+55       1.4212     51.17  Q         |         |         |         |
  1+ 0       1.8781     66.33  Q         |         |         |         |
  1+ 5       2.4573     84.10  Q         |         |         |         |
  1+10       3.1591    101.91  VQ        |         |         |         |
  1+15       4.0376    127.55  VQ        |         |         |         |
  1+20       4.9523    132.82  VQ        |         |         |         |
  1+25       5.9421    143.71  VQ        |         |         |         |
  1+30       7.0138    155.62  VQ        |         |         |         |
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12+ 5     320.4195    520.32  |      Q  V|          |          |          |
12+10     324.0253    523.56  |      Q  V|          |          |          |
12+15     327.6552    527.06  |      Q  V|          |          |          |
12+20     331.3076    530.34  |      Q  V|          |          |          |
12+25     334.9826    533.60  |      Q   V          |          |          |
12+30     338.6782    536.61  |      Q   V          |          |          |
12+35     342.3945    539.60  |      Q   V          |          |          |
12+40     346.1279    542.08  |      Q   V          |          |          |
12+45     349.8778    544.49  |      Q   V          |          |          |
12+50     353.6409    546.39  |      Q   V          |          |          |
12+55     357.4107    547.39  |      Q   V          |          |          |
13+ 0     361.1781    547.02  |      Q   V          |          |          |
13+ 5     364.9389    546.08  |      Q   V          |          |          |
13+10     368.6928    545.06  |      Q   |V         |          |          |
13+15     372.4229    541.61  |      Q   |V         |          |          |
13+20     376.1797    545.48  |      Q   |V         |          |          |
13+25     379.9521    547.76  |      Q   |V         |          |          |
13+30     383.7373    549.61  |      Q   |V         |          |          |
13+35     387.5437    552.70  |      Q   |V         |          |          |
13+40     391.3727    555.97  |      Q   |V         |          |          |
13+45     395.2307    560.18  |      Q   |V         |          |          |
13+50     399.1188    564.54  |      Q   |V         |          |          |
13+55     403.0413    569.55  |      Q   | V        |          |          |
14+ 0     407.0005    574.88  |      Q   | V        |          |          |
14+ 5     411.0090    582.03  |      Q   | V        |          |          |
14+10     415.0743    590.28  |      Q   | V        |          |          |
14+15     419.2017    599.30  |       Q  | V        |          |          |
14+20     423.3942    608.75  |       Q  | V        |          |          |
14+25     427.6634    619.89  |       Q  | V        |          |          |
14+30     432.0134    631.62  |       Q  | V        |          |          |
14+35     436.4568    645.18  |       Q  |  V       |          |          |
14+40     441.0024    660.03  |       Q  |  V       |          |          |
14+45     445.6650    677.00  |       Q  |  V       |          |          |
14+50     450.4539    695.35  |        Q |  V       |          |          |
14+55     455.4002    718.20  |        Q |  V       |          |          |
15+ 0     460.5286    744.65  |        Q |  V       |          |          |
15+ 5     465.8660    775.00  |         Q|  V       |          |          |
15+10     471.4151    805.72  |         Q|   V      |          |          |
15+15     477.2383    845.53  |         Q|   V      |          |          |
15+20     483.2083    866.84  |          Q   V      |          |          |
15+25     489.3660    894.10  |          Q   V      |          |          |
15+30     495.7136    921.68  |          Q   V      |          |          |
15+35     502.2571    950.12  |          |Q   V     |          |          |
15+40     508.9971    978.64  |          |Q   V     |          |          |
15+45     515.9459   1008.96  |          |Q   V     |          |          |
15+50     523.1131   1040.69  |          | Q  V     |          |          |
15+55     530.5501   1079.85  |          | Q  V     |          |          |
16+ 0     538.3267   1129.16  |          |  Q  V    |          |          |
16+ 5     546.8721   1240.79  |          |   Q V    |          |          |
16+10     556.1291   1344.11  |          |    QV    |          |          |
16+15     565.6927   1388.64  |          |     Q    |          |          |
16+20     575.7254   1456.75  |          |      Q   |          |          |
16+25     586.4057   1550.78  |          |      VQ  |          |          |
16+30     597.6472   1632.27  |          |      V Q|          |          |
16+35     609.6037   1736.08  |          |       V Q          |          |
16+40     622.6296   1891.36  |          |       V | Q        |          |
16+45     636.7250   2046.65  |          |        V|   Q      |          |
16+50     652.0473   2224.79  |          |        V|     Q    |          |
16+55     669.5975   2548.30  |          |         V        Q|          |
17+ 0     689.1737   2842.47  |          |         V          |  Q       |
17+ 5     710.2279   3057.06  |          |         |V         |    Q     |
17+10     731.2217   3048.30  |          |         |V         |    Q     |
17+15     754.1634   3331.14  |          |         | V        |        Q|
```

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Appendix G: Impact / No Impact Summaries

Antelope Valley – East Kern Water Agency
High Desert Water Bank
"No Impact" Determination Summary Table

CATEGORY OF IMPACT FROM CEQA CHECKLIST	BASIS FOR " NO IMPACT" FINDING
Aesthetics - Would the project:	
a) Have a substantial adverse effect on a scenic vista	There are no scenic vistas in the Project area.
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway	No damage to trees, rock outcroppings, and historic buildings will occur. The site is not near a state scenic highway
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	No features of the Project would substantially degrade the existing visual character or quality of the site and its surroundings. Temporary berms will not be higher than about 36 inches. Above ground facilities will not be inconsistent with facilities existing in the area.
Agriculture and Forest Resources – Would the project:	
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	The Project will not involve any land use zoning or designation changes and there is no Williamson Act farmland within the Project site.
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))?	There are no forest or timber lands within or near the Project site.
d) Result in the loss of forest land or conversion of forest land to non-forest use?	There are no forest or timber lands within or near the Project site.
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 will not convert active farmland to other uses. There are no forest or timber lands within or near the project site.
Air Quality - Would the project:	
a) Conflict with or obstruct implementation of the applicable air quality plan?	The project is consistent with the existing land use and would not involve land use zoning or designation changes. As such, the project would not conflict with or obstruct the implementation of the applicable air quality plan.

e) Create objectionable odors affecting a substantial number of people?	Due to the substantial distance to the nearest sensitive receptors and the highly diffusive properties of diesel exhaust, nearby receptors would not be affected by diesel exhaust odors associated with project construction
Biological Resources – Would the project:	
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service?	No sensitive natural communities occur within the Project site.
c) 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?	No federally protected waters occur within the Project site. None of the potential wetland and waters features exhibit hydrologic connection to any Traditional Navigable Waters (TNWs).
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	Project does not conflict with any local policies or ordinances protecting biological resources.
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 Project occurs within the area covered by the Antelope Valley Areawide General Plan and in the area covered by the West Mojave Plan. However, it does not occur within or adjacent to any areas identified as Significant Ecological Areas and, with mitigation, will not impact species covered by the West Mojave Plan. Thus, there will be no conflicts with existing conservation plans.
Geology and Soils – Would the project:	
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	
iv) Landslides?	Due to the relatively flat nature of the land, there is minimal potential for landslides within the alluvial plane of the Antelope Valley.
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	The National Resource Conservation Service identifies the majority of the site as having no limitations to site development (Building of structures).
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	Any small septic systems that may be constructed on site will be situated in soils capable of supporting a septic system.
Greenhouse Gas Emissions – Would the project:	
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	The project would not conflict with the Scoping Plan updates, or any other plans, policies, or regulations for the purpose of reducing GHG emissions.

Hazards and Hazardous Materials – Would the project:	
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?	The project site is not listed as a hazardous materials site.
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?	There are no public or private airports within 2 miles of the project area.
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	The project is sited in a rural area and is not anticipated to impair the implementation of any emergency response plan.
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	It is not anticipated that the project will expose any residents in the vicinity to potential wildfires.
Hydrology and Water Quality – Would the project:	
a) Violate any water quality standards or waste discharge requirements?	The proposed Project will not violate water quality standards or waste discharge requirements.
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	The project does not involve the construction of new housing.
j) Inundation by seiche, tsunami, or mudflow?	The project site lies in the alluvial plains of the Antelope Valley. There are no existing nor proposed Project conditions that would result in a Inundation by seiche, tsunami, or mudflow.
Land Use and Planning – Would the project:	
a) Physically divide an established community?	The proposed Project would not physically divide an established community. The Proposed Project construction and operation would not restrict movement through or around the area.
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	The proposed project does not change any Land Use designations and or Zoning of the land. The proposed Project also will not prohibit low level flight military operations near the proposed project area.

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	There are no habitat or natural community conservation plans within the project site.
Mineral Resources – Would the project:	
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	The 2015 Antelope Valley Areawide Plan does not identify the land within the proposed project area as designated for mineral resource extraction.
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?	
Noise – Would the project:	
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 expose people residing or working in the project area to excessive noise levels?	There are no public or private airports within 2 miles of the project area.
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	
Population and Housing – Would the project:	
a) Induce substantial 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 is not intended nor does it include conditions that have the potential to induce population growth.
Public Services – Would the project:	
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	The proposed project will not have any impact to schools, parks, and other public facilities.
Schools, Parks, and Other Public Facilities.	

Recreation – Would the project:	
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	The proposed Project does not directly affect existing recreational resources. It would not result in increased use of, loss of access to, or minimized quality of parks within nearby existing communities. Because the project does not affect local population or existing land uses, the project would not result in increased demand for recreation.
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	
Transportation / Traffic – Would the project:	
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	The project area does not include a state highway or principal arterial within the 2010 Congestion Management Program (CMP) for Los Angeles County and the project would be consistent with the Transportation Demand Management (TDM) Element and TDM Ordinance Requirements of the CMP (Los Angeles County Metropolitan Transportation Authority 2010). Additional short and long term traffic being generated as a result of the project is less than significant and is not anticipated to change the Level of Service LOS of State Highway 138.
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the District congestion management agency for designated roads or highways?	
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	The Project does not propose any changes to existing roads that would constitute a traffic hazard.
e) Result in inadequate emergency access	Operations of the project will not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan since the project does not include the development of physical structures that would impede such a plan.
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	The proposed site is bordered by unpaved roads with no public transit, bicycle, or pedestrian facilities.
Utilities and Service Systems – Would the project:	
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	The Project does not involve the treatment of Wastewater.

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	There are no new or an expansion to existing water or wastewater treatment facilities associated with this project.
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	There are no new or an expansion to existing storm water drainage facilities associated with this project.
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	Water for the project will come from the Agency and its partners' State Water Project allocations. There is no new demand for water associated with this project.
e) 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?	There is no wastewater treatment required from the proposed project. The amount of wastewater that may be generated by a bathroom for the bank operator at the site will be insignificant and will be disposed by means of a septic system.
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	Other than during construction operations, there are no permanent solid waste disposal needs for the operation of this project.
g) Comply with federal, state, and local statutes and regulations related to solid waste?	The Project will comply with federal, state, and local statutes and regulations related to solid waste

Antelope Valley – East Kern Water Agency
High Desert Water Bank
"Less Than Significant Impact" Determination Summary Table

CATEGORY OF IMPACT FROM CEQA CHECKLIST	BASIS FOR "LESS THAN SIGNIFICANT" IMPACT
Aesthetics- Would the project:	
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	The project will require the addition of light for the pump station and storage site. The level of light source would be negligible.
Agriculture and Forest Resources– Would the project:	
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	The project site is large enough for semi active Prime Farmland to not be converted. Fallowed Prime Farmland will remain fallowed with the option to use for recharge operations.
Air Quality – Would the project:	
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	Construction related criteria pollutant emissions would exceed the AVAQMD daily threshold for NOx. The Agency proposes to implement mitigation measures that would bring this criteria pollutant below the threshold and thus impact would be less than significant.
c) 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	
d) Expose sensitive receptors to substantial pollutant concentrations?	
Biological Resources Would the project:	
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	The proposed Project has the potential to impact existing suitable habitat for special status species. The lessen the impact to a level less than significant the Agency will implement biological mitigation measures as identified in the Initial Study.

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?	
Culture Resources– Would the project:	
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	The Project will cause no significant changes to cultural resources including historical, archeological, and paleontological as defined in CEQA Section 15064.5. Buried cultural resources may possibly be affected by the Project as the site has been designated as a low to moderate potential for cultural resource findings. The Agency has set mitigation measures to lessen the impact to found cultural resources to a level which is less than significant.
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	
d) Disturb any human remains, including those interred outside of formal cemeteries?	
Geology and Soils – Would the Project :	
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	The site is located near two major active faults which have the potential to generate seismic activity. No provisions for this project increase the potential for this to occur but its occurrence could affect the project facilities and nearby neighbors. The agency has proposed mitigation measures that will lessen the impact associated with seismic activity to a level which is less than significant.
ii) Strong seismic ground shaking?	
iii) Seismic-related ground failure, including liquefaction?	
b) Result in substantial soil erosion or the loss of topsoil?	There is the potential for soils erosion to occur during construction and operation of the project. The Agency has proposed mitigation measures to control erosion to a level which is less than significant.
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?	The Project area is situated within land that currently supports similar water infrastructure facilities including the California Aqueduct and nearby recharge facilities. The proposed recharge operations have the potential to raise groundwater level to levels that could increase the potential of liquefaction. The Agency has proposed mitigation measures that will monitor groundwater levels and thus minimizing the potential impact to less than significant.

Greenhouse Gas Emissions – Would the Project :	
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	The total construction related and operational GHG emissions associated with the project would be less than the AVAQMD daily and annual thresholds for GHG. Thus, the project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.
Hazards and Hazardous Materials– Would the project:	
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	With the exception of construction activities, the proposed Project does not involve the transport, use, and disposal of hazardous materials. Best Management Practices (BMPs) as well mitigation measures will be implemented to lessen the impacts to less than significant.
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	
Hydrology and Water Quality – Would the Project :	
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	For the most part the project will be of benefit to groundwater levels. During recovery operations, there is the potential that groundwater levels will be dropped on a localized level. This level drop has the potential to affect nearby well Owners. The Agency has implemented mitigation measures to bring the impact level to less than significant.
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	The atypical design of the recharge basins consisting of similar agricultural flood irrigation methods will have a less than significant effect to the local drainage patterns. Berms would be constructed as sacrificial during times of flood events. Drainage flows would enter and leave the site at relatively the same locations and with the same intensity.
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	
e) 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?	The potential for storm water runoff pollution will be minimized to levels less than significant with the implementation of mitigation measures.

f) Otherwise substantially degrade water quality?	Import of surface water supplies into the local groundwater and return flows to the California Aqueduct has the potential to degrade water quality. The evaluation in the Initial Study has determined that neither water supply and blended water would be affected to levels that would reduce its beneficial use.
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	Construction of the proposed pump station and storage tank will be sited such that the impact to drainage patterns will be minimal.
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	Other than the California Aqueduct, there are no levees or dams that have the potential to affect the Project area. It is anticipated that a failure of the California Aqueduct would result in low shallow flows across the project site and would not be greater than current flood hazards. The atypical design for construction of the recharge basins would also not result in a significant additional risk to people or structures in the event of a flood.
Noise – Would the project:	
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	Mitigation measures will lessen the noise impacts to nearby residential homes abutting 280th St. West to a level which is less than significant.
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	Some vibration may be generated by construction activities. However, this vibration will be temporary and have a less than significant impact to the residents who live along 280th St. West. Most of the homes would have at a minimum 100 foot or greater setback from the construction operations. This setback decreases the vibration from the construction locations because vibration attenuates quickly in soil. Therefore, the effect from construction related vibrations.
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	Mitigation measure will reduce the permanent noise impacts to nearby residential homes abutting 280th St. West to a level which is less than significant.
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	Mitigation measures will monitor and if necessary reduce the temporary noise impacts to nearby residential homes abutting 280th St. West to a level which is less than significant.
Population and Housing – Would the Project :	
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	There is the potential for the displacement of a single family dwelling unit within the Proposed Project boundaries. The overall impact associated with this potential displacement has been determined to be less than significant due to the quantity of affected housing (single structure).

c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	There is the potential for the displacement of a family associated with the potential demolition of an existing house within the project site. The overall impact associated with this potential displacement has been determined to be less than significant due to the number of people that would be potentially displaced (single family).
Public Services – Would the project:	
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	During construction of the proposed project there is the potential to need fire and police protection at the site as a result of an accident. This need is anticipated to be low and thus the impact is less than significant.
Fire and Police Protection	
Transportation and Traffic – Would the project:	
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?	The project would not include any aviation components or structures where height would be an aviation concern and therefore would not affect air traffic patterns. Potential bird strikes are present and would be minimized to levels less than significant with implementation of mitigation measures identified in the Hazards section of the Initial Study.
Tribal Cultural Resources – Would the Project:	
cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:	The Project will cause no significant changes to tribal cultural resources. Buried cultural resources may possibly be affected by the Project as the site has been designated as a low to moderate potential for cultural resource findings. The Agency has set mitigation measures to lessen the impact to found cultural resources to a level which is less than significant.
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c)	

of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	
Mandatory Findings of Significance – Would the Project:	
a) Have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	There are no waters within the project site that have the ability to support suitable habitat for fish. The potential impacts to wildlife and plant species will be mitigated to a level which would be considered less than significant. Mitigation measures will be implemented to minimize the impacts of unknown cultural resources to a level which is less than significant.
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 proposed Project is not inconsistent with regional land use plans including land use, zoning, and minerals. The impacts associated with this project will be mitigated and the same is understood to have taken place for past and expected for future projects.
c) Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	With the exception of noise impacts to adjacent residences, the project would not consist of any use or activities that would negatively affect any persons in the vicinity.

Appendix H: Public Review Comments and Responses

STATE OF CALIFORNIA | The Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
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EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director

July 13, 2017

Mr. Dwayne Chisam, P.E., General Manager
Antelope Valley- East Kern Water Agency
6500 West Avenue N
Palmdale, CA 93551
Email: DChisam@avek.org

SUBJECT: HIGH DESERT WATER BANK (PROJECT)
INITIAL STUDY (IS) AND DRAFT MITIGATED NEGATIVE DECLARATION (DMND), SCH# 2017061030

Dear Mr. Chisam:

The California Department of Fish and Wildlife (CDFW) received a Notice of Intent to Adopt a DMND from the Antelope Valley- East Kern Water Agency (AVEK) for the Project pursuant the California Environmental Quality Act (CEQA) and CEQA Guidelines.[1]

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California fish and wildlife. Likewise, we appreciate the opportunity to provide comments regarding those aspects of the Project that CDFW, by law, may be required to carry out or approve through the exercise of its own regulatory authority under the Fish and Game Code.

CDFW's ROLE

CDFW is California's **Trustee Agency** for fish and wildlife resources, and holds those resources in trust by statute for all the people of the State. [Fish & Game Code, §§ 711.7, subdivision (a) & 1802; Public Resources Code, § 21070; CEQA Guidelines § 15386, subdivision (a)]. CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species (Id., § 1802). Similarly, for purposes of CEQA, CDFW is charged by law to provide, as available, biological expertise during public agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect state fish and wildlife resources.

CDFW is also submitting comments as a Responsible Agency under CEQA (Public Resources Code, § 21069; CEQA Guidelines, § 15381). CDFW expects that it may need to exercise regulatory authority as provided by the Fish and Game Code, including lake and streambed alteration regulatory authority (Fish & Game Code, § 1600 et seq.). Likewise, to the extent implementation of the Project as proposed may result in "take", as defined by State law, of any species protected under the California Endangered Species Act (CESA) (Fish & Game Code, §

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1 CEQA is codified in the California Public Resources Code in section 21000 et seq. The "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

2050 et seq.), or state-listed rare plant pursuant to the Native Plant Protection Act (NPPA; Fish and Game Code §1900 et seq.) authorization as provided by the applicable Fish and Game Code will be required.

PROJECT DESCRIPTION SUMMARY

Proponent: AVEK

Objective: AVEK proposes the development and operation of a groundwater bank on approximately 1,500 acres of undeveloped land. The Project would store State Water Project water supplies from AVEK and other banking participants during wet weather periods when supplies exceed demands and would recover the water for use by AVEK and its partners during dry weather years when demands exceed supplies and other times when there are disruptions to State Water Project Supplies. Implementation of this Project will require the construction of monitoring and production water wells, turnouts off the California Aqueduct, underground and above ground pipelines, recharge basins, and water storage and booster pump facilities.

Location: The Project is located in unincorporated Los Angeles County, in the western Antelope Valley, northwest of the community of Neenach and bounded by Avenue A and the Kern County line on the north, 280th St. West on the east, 300th St. West on the west, and the California Aqueduct on the south.

The Project site encompasses a largely undeveloped area that was previously used to support agricultural activities and grazing. The Project site is located immediately north of the California Aqueduct, which supports dense brush and trees on the south side. Three native or naturalized vegetation communities, including fiddleneck (*Amsinckia* sp.) fields, rubber rabbitbrush (*Ericameria nauseosa*), and non-native annual grasslands, and two anthropogenic land cover types, including fallow agriculture and development, were identified in the IS within the site.

Timeframe: Project construction is expected to start in January of 2018 and take two years to complete. Ongoing operations will continue based on water source availability.

COMMENTS AND RECOMMENDATIONS

CDFW offers the comments and recommendations below to assist AVEK in adequately identifying, avoiding and/or mitigating the Project's significant, or potentially significant, direct and indirect impacts on fish and wildlife (biological) resources. Editorial comments or other suggestions may also be included to improve the document. Based on the potential for the Project to have a direct and cumulative significant impact on biological resources, CDFW concludes that an Environmental Impact Report is appropriate for the Project.

Project Description and Related Impact Shortcoming

Comment #1: Impacts to special status plants

Issue: The DMND **describes that the Project site** is comprised of undeveloped and fallowed agricultural land that primarily contains recovering exotic and native scrub and herbaceous species. No special status vegetative communities or botanical species were observed on the Project site and therefore no further assessment or mitigation for botanical species was described in the DMND. Page 22 of the IS states, "Biological resources within the Project site

were evaluated based on a literature review including a review of the California Natural Diversity Database (CNDDB) and field surveys of the Project site conducted in March and April 2017. Field surveys included reconnaissance-level biological surveys and a general habitat assessment with a focus on identifying habitats that may support special-status species, as well as vegetation community mapping. Protocol-level surveys for special-status species and formal jurisdictional delineations of the waters features were not conducted at this time."

CDFW is concerned that botanical surveys conducted on the Project site warrant further effort in order to adequately inform avoidance or mitigation measures for special status plant species.

Specific impacts: Project induced population declines or local extirpation of special status plants may result from immediate death, reduced reproductive capacity, increased competition with exotic invasive weeds, altered soil chemistry, and reduce photosynthesis and reproductive capacity.

Why impacts would occur: Use of heavy equipment and other ground disturbances, excessive dust deposition and ongoing operations including periodic flooding could result in loss of special status plant populations and the habitat supporting these resources.

Evidence impact would be significant: Project construction and ongoing operations may result in 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 CDFW or USFWS.

Recommended Potentially Feasible Mitigation Measure(s):

Mitigation Measure #1: CDFW recommends focused botanical surveys be conducted on the Project site to maximize the potential for documenting special status plant species, and to avoid or mitigate for Project impacts to special status botanical resources below a level of significance under CEQA. CDFW recommends that any focused botanical surveys be conducted following CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations* and Natural Communities (Survey Protocols) see: (http://www.dfg.ca.gov/ biogeodata/vegcamp/natural communities.asp).

Mitigation Measure #2: CDFW recommends that the CEQA document for the Project provide a discussion on the presence or absence of special status plant species and Project impacts, avoidance and mitigation measures such as off-site acquisition and protection of occupied habitat. To fully mitigate for take of plants listed under CESA, or state- listed rare plants under NPPA, further consultation with CDFW under CESA and NPPA may be required.

Comment #2: Impacts to Desert Tortoise

Issue: Although the IS stated that protocol level surveys were not conducted for special status wildlife species on the Project site and explains that that desert tortoise presence were observed (scat, tracks, egg shell fragments, burrows/pallets, shell/bone/scutes, or courtship rings) during the Project field observations. The IS concluded that because all habitat within the Project Area is of poor quality for desert tortoises, it is unlikely that they would occur within the Project Area or its vicinity.

The Project is within the range of the state and federal threatened desert tortoise. CDFW is concerned that presence of this species on the Project site may have been missed and will not be considered in future Project construction and operation activities in order to determine Project impact, avoidance and mitigation measures for this species.

Specific impact: The Project may result in mortality or injury to desert tortoise and their habitat resulting in further declines within the range for this species.

Why impact would occur: Use of heavy equipment and other ground disturbance and ongoing operations would result in long-term permanent disturbances and type conversion of desert tortoise habitat. Habitat alterations would occur within those areas that would be developed to support groundwater recovery and monitoring wells, aboveground pipelines, and related infrastructure. Vegetation clearing, earthen berm construction, and regular, rotating inundation of the recharge basins would also occur.

Evidence impact would be significant: Project construction and ongoing operations may result in 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 CDFW or USFWS.

Recommended Potentially Feasible Mitigation Measure(s):

Mitigation Measure #1: To reduce impacts to less than significant, CDFW recommends that focused protocol surveys should be conducted for desert tortoise prior to Project ground disturbances and throughout the life of the Project operations. CDFW recommends the implementation of timely surveys using the current Service protocol "*Preparing for any action that may occur within the range of the Mojave Desert Tortoise*" (See http://www.fws.gov/Ventura/species_information/protocols_guidelines/index.html as results are only valid for one year from the date of survey.

Mitigation measure #2: Erecting United States Fish and Wildlife Service approved exclusionary fencing around the Project site for desert tortoise will restrict desert tortoise from entering the Project site if protocol surveys resulted in negative results. Fencing will avoid the necessity of repeating surveys on an annual basis

Mitigation measure #3: Take of desert tortoise is prohibited, except as authorized by state law (Fish and Game Code, §§ 2080, 2085.) Consequently, if the Project, Project construction, or any Project-related activity will result in take of desert tortoise under CESA, CDFW recommends that the Project proponent seek appropriate take authorization under CESA prior to implementing the Project because this authorization will be required if tortoise relocation off-site or other unavoidable take will be necessary during anytime during the life of the Project. Appropriate authorization from CDFW may include an incidental take permit (ITP) or a consistency determination in certain circumstances, among other options (Fish and Game Code §§ 2080.1, 2081, subds. (b), (c)). Early consultation is encouraged, as significant modification to a Project and mitigation measures may be required in order to obtain a CESA Permit. Revisions to the Fish and Game Code, effective January 1998, may require that CDFW issue a separate CEQA document for the issuance of an ITP unless the Project CEQA document addresses all Project affects to CESA-listed species and specifies a mitigation monitoring and reporting program that will meet the requirements of an ITP. For these reasons, biological mitigation

monitoring and reporting proposals should be of sufficient detail and resolution to satisfy the requirements for a CESA ITP. If desert tortoise is present on the Project site or observed on the Project site during surveys or otherwise though the life of the Project, any incidental take permit issued by CDFW for take of this species may condition the acquisition and protection in perpetuity of acceptable replacement mitigation habitat to be managed by a land conservancy approved by CDFW.

Comment #3: Impacts to Swainson's hawk (*Buteo swainsoni*)

The DMND describes that the Project site supports some trees and foraging habitat for raptor species and that additional trees occur immediately south of the Project site along the California Aqueduct.

Issue: The DMND describes specific wildlife species observed on the Project site. CDFW is concerned the DMND may not have fully characterized the extent of Project impacts to Swainson's hawk (*Buteo swainsoni*), a species listed as threatened under CESA. California's southernmost breeding population of Swainson's hawk is known to breed in the Antelope Valley, utilizing similar nesting and foraging habitat as the Project site and vicinity.

Specific impact: Construction and continued operation of the Project could result in direct and indirect mortality or injury to Swainson's hawk, their nesting habitat and their foraging habitat. Project impacts can result in reduced or failed reproductive success leading to further direct and cumulative statewide and local declines of this species and its habitat within its range.

Why impact would occur: Project areas would be developed to support groundwater recovery and monitoring wells, aboveground pipelines, and related infrastructure. Vegetation clearing, earthen berm construction, and regular, rotating inundation of the recharge basins would also occur. These actions could result in direct mortality of Swainson's hawk eggs and nestlings through nest abandonment, increased predation and direct mortality from equipment or tree felling activities. Loss of prey species for Swainson's hawk could also be expected to occur from ground disturbance, rodent control and other incompatible habitat type conversions during Project construction and ongoing operations.

Evidence impact would be significant: The Project may continue to 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 CDFW or United States Fish and Wildlife Service (USFWS).

Recommended Potentially Feasible Mitigation Measure(s)

Mitigation Measure #1: CDFW recommends Project take avoidance of Swainson's hawk and loss of their foraging habitat. To reduce Project impacts to Swainsion's hawk to less than significant under CEQA, CDFW recommends AVEK require focused Swainsion's hawk surveys be conducted to fully analyze the potential for Project impacts, avoidance and mitigation measures prior to certification of the CEQA document. Surveys for Swainsion's hawk should conform to CDFW's protocol: *Swainson's Hawk Survey Protocols, Impact Avoidance, and Minimization Measures for Renewable Energy Projects in the Antelope Valley of Los Angeles and Kern Counties, California State of California California Energy Commission and Department*

of Fish and Game June 2, 2010, see CDFW website (https://www.wildlife.ca.gov/Conservation/Survey-Protocols#377281284-birds).Surveys should include all potential Swainson's hawk nesting habitat within a 5 mile radius of the Project site. Surveys should include all potential nest trees, towers or other potential nest sites (including nests used within the last 5 years) outside the nesting season for Swainson's hawk. Surveys should be conducted by a CDFW-approved raptor biologist. The results of the surveys may influence subsequent nest survey efforts, Project avoidance and other mitigation measures ultimately adopted within the final CEQA document.

Mitigation Measure # 2: The unavoidable take of Swainson's haw is prohibited except as authorized by state law (Fish and Game Code, §§ 2080, 2085.). If the Project will result in unavoidable take of Swainson's hawk, further consultation with the CDFW for issuance of any ITP under CESA would be required before any Project impacts resulting in take could occur. Any ITP issued by CDFW for unavoidable take of Swainson's hawk may condition the acquisition and in perpetuity preservation and management of habitat mitigation lands.

Mitigation Measure #3: Type conversion of Swainson's hawk foraging habitat within a 5-mile radius of an active Swainson's hawk nest should be avoided to maximize Swainson's hawk prey habitat availability and nesting survival. CDFW also recommends AVEK seek an ITP for any Project related loss of Swainson's hawk foraging habitat within a 5 miles radius of an active nest. If loss of Swainson's hawk foraging habitat cannot be avoided by the Project, CDFW recommends the development of a mitigation plan that should focus on providing habitat management lands. Lands that are currently in urban use or lands that have no existing or potential value for foraging Swainson's hawks will not require mitigation nor would they be suitable for mitigation. The plans should call for mitigating loss of Swainson's hawk foraging habitat by providing habitat management lands within the Antelope Valley Swainson's hawk breeding range at a minimum 2:1 ratio for such habitat impacted within a five-mile radius of active Swainson's hawk nest(s). CDFW considers a nest active if it was used one or more times within the last 5 years. Project developers may consider delegating responsibilities for acquisition and management of the habitat management lands to third party, such as a nongovernmental organization dedicated to Mojave Desert habitat conservation (pending approval of such delegations from CDFW and the appropriate lead agency).

Comment #4: Impacts to tricolored blackbird (*Ageliaus tricolor*)

The IS describes that one State candidate species, tricolor blackbird, was observed on an adjacent property, immediately south of the Project site. Tricolor blackbirds were observed foraging in an irrigated agricultural field and roosting in adjacent trees in a mixed flock with yellow-headed blackbirds (*Xanthocephalus xanthocephalus*) on the south side of the California Aqueduct. Nesting may occur near the aqueduct, although field surveys could not confirm this. This species may forage within the grasslands and fiddleneck fields of the Project site.
The DMND describes, in mitigation measure BIO-3, if construction activities occur within the breeding bird season, all vegetation clearing and initial ground disturbing activities will be preceded by a nesting bird survey.

Issue: CDFW is concerned that BIO-3 is insufficient to prevent Project direct or indirect take of tricolored blackbird and their foraging habitat when nesting on or adjacent to the Project site.

Specific impact: Construction and continued operation of the Project could result in direct and indirect mortality or injury to tricolored blackbird, their nesting habitat and their foraging habitat resulting in reduced or failed reproductive success and further declines of this species within its range.

Why impacts would occur: Construction of the proposed Project, including buried and aboveground pipelines, monitoring wells, groundwater recovery wells, and associated facilities, and approximately 1,200 acres of recharge basins will occurs throughout the annual grassland, fiddleneck field, and rubber rabbitbrush scrub within the southern two thirds of the Project site. Project areas would be developed to support groundwater recovery and monitoring wells, aboveground pipelines, and related infrastructure. Vegetation clearing, earthen berm construction, and regular, rotating inundation of the recharge basins would also occur. Flooding or other Project related disturbances will removal or disturbances vegetation on the Project site resulting in nest abandonment or direct mortality of tricolored blackbird eggs and nestlings within nesting colonies on or adjacent to the Project site during the nesting season. Abandonment of nests by adults can result in increased egg and nestling mortality from increased predation or exposure to lethal temperatures.

Evidence impact is significant: The Project may 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 CDFW or USFWS.

Recommended Potentially Feasible Mitigation Measure(s)

Mitigation Measure #1: To reduce Project impacts to tricolored blackbird to less than significant, CDFW recommends the Lead Agency require focused tricolored blackbird surveys during the nesting season to fully analyze the potential for Project impacts and inform avoidance and mitigation measures prior to certification of the CEQA document. Surveys should include potential nesting and nesting season foraging habitats on the Project site and within three miles from the Project site for any nesting colony that may forage on the Project site. Surveys will inform locations of tricolored blackbird nesting colonies and foraging habitat during the nesting season so that Project activities can be planned to avoid take of tricolored blackbird eggs and nestlings. Surveys should be conducted whenever ground disturbances or other changes in vegetation, including groundwater basin flooding or intentional drawdowns are to occur on the Project site during the tricolored blackbird nesting season.

Mitigation Measure # 2: CDFW recommends that the Project avoid flooding, draining or otherwise disturbing occupied tricolored blackbird nesting and foraging habitat on the Project site during the nesting season.

Mitigation Measure #3: The unavoidable take of tricolored blackbird and their nesting season foraging habitat within three miles of an active nesting colony is prohibited except as authorized by state law (Fish and Game Code, §§ 2080, 2085.). If the Project will result in unavoidable impacts to tricolored blackbird, further consultation with the CDFW under CESA would be required before the Project impacts resulting in take may occur.

Mitigation Measure # 4: Any ITP issued by the CDFW for the unavoidable direct or indirect take of tricolored blackbird or their occupied nesting and foraging habitat may condition

acquisition and protection in perpetuity of tricolored blackbird nesting and foraging habitat near the Project site in appropriate habitat. A conservation easement should be recorded over the mitigation land and managed by a local land conservancy.

Comment #5: Impacts to burrowing owl (*Athene conicularia*)

Issue: The DMND describes that the Project site supports potential nesting and foraging habitat for burrowing owl, a California species of special concern and as a native bird species is afforded, take avoidance protection under state and federal law. The DMND concludes that, minus mitigation measures, the Project may result in significant adverse impacts to burrowing owl, which would be considered significant under CEQA. The DMND describes in mitigation measure BIO-1 that immediately preceding Project construction, the Project will adopt burrowing owl survey, avoidance and mitigation measures that will adhere to guidelines provided in CDFW's 2012 *Staff Report on Burrowing Owl Mitigation.*

CDFW concurs with the DMND that unmitigated adverse Project impacts to burrowing owl could be significant under CEQA and that burrowing owl surveys and mitigation measures should be conducted following CDFW's guidelines. However, CDFW is concerned that the proposed trigger for performing burrowing owl surveys appears to be narrowly focused primarily on initial Project construction activities. CDFW believes that in addition to initial Project construction, other ongoing Project operation and maintenance activities could also significantly adversely affect burrowing owl resulting in unauthorized take and loss of habitat.

Specific impact: The Project may result in direct and indirect burrowing owl mortality or injury, the disruption of natural burrowing owl breeding behavior, and loss of breeding, wintering and foraging habitat for the species. Impacted habitats include native fiddleneck fields and rubber rabbitbrush scrub, and non-native annual grasslands, which are used by burrowing rodents, insects and reptiles, which are considered essential burrowing owl prey. Project impacts would continue to contribute to statewide population declines for burrowing owl that has essentially been extirpated from Los Angeles County except for the Antelope Valley where it still persists in low densities and continues to experience significant direct and cumulative habitat loss.

Why impact would occur: Impacts to burrowing owl could result from vegetation clearing and other ground disturbances from infrastructure construction, and regular, rotating inundation of recharge basins that would affect approximately 1,200 acres of the site. Rotating inundation would temporarily remove up to 400 acres of the recharge basins from use as habitat at any one time, and is likely to occur on a quarterly (every 3 months) basis during wet years. Inundation of occupied burrowing owl habitat could flood active burrows resulting in mortality and loss of occupied habitat. Constructed basin berms may require periodic control of burrowing mammals and may include rodenticides or other chemical controls that could result in direct or secondary poisoning of burrowing owl. Rodent control activities could also reduce prey for burrowing owl foraging on the Project site.

Evidence impact would be significant: Project impacts may continue to result in substantial adverse effects, 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 CDFW or USFWS. Adverse impacts to burrowing owl may occur because the DMND does not condition take avoidance surveys prior to continued Project operations including but not limited to habitat flooding, ground disturbances and rodent control activities.

Recommended Potentially Feasible Mitigation Measure(s):

Mitigation Measure #1: To reduce Project impacts to burrowing owl to less than significant, CDFW recommends that the Project adhere to CDFW's March 7, 2012. *Staff Report on Burrowing Owl Mitigation* as referenced in the DMND. All survey efforts should be conducted prior to any Project habitat disturbance activities including initial construction and ongoing operations including inundation of potential burrowing owl habitat for the life of the Project.

Mitigation Measure #2: Permanent impacts to occupied burrowing owl burrows and adjacent foraging habitat should be mitigated for by setting aside replacement habitat to be protected in perpetuity under a conservation easement dedicated to a local land conservancy. A burrowing owl mitigation plan should be submitted to CDFW for review and approval prior to Project implementation.

Comment #6: Impacts to American badger (*Taxidea taxus*) and desert kit fox (*Vulpes macrotis*)

Issue: Mitigation measure BIO-2 in the DMND describes measures to avoid Project take of desert kit fox and American badger. Mitigation measure BIO-2 described in the MND include surveys to detect presence of desert kit fox and American badger two weeks before start or Project construction and other measures to avoid take of adults and young in active burrows.

CDFW generally concurs with the survey and take avoidance measures described in the DMND for desert kit fox and American badger. However, CDFW is concerned that the proposed trigger for performing surveys appears to be narrowly focused primarily on initial Project construction activities. CDFW believes that in addition to initial Project construction, other ongoing Project operation and maintenance activities could also significantly adversely affect desert kit fox and American badger. American badger and desert kit fox are considered fur bearing mammals for which take is prohibited (Cal. Code Regs., tit. 14, § 460). American badger is also a California species of special concern. CDFW is also concerned that BIO-2 should describe in greater detail how the presence of dependent young of American badger and desert kit fox will be determined and take avoided by burrow disturbance activities. Adverse project impacts to desert kit fox and American badger would be considered significant under CEQA.

Specific impacts: The Project may result in direct and indirect American badger and desert kit fox mortality or injury and the disruption of breeding behavior contributing to significant cumulative statewide population declines for these species. Desert kit fox in particular have limited representation as a resident mammal in Los Angeles County because of the limited habitat supporting this species in the County that continues to experience solar energy industrialization and other forms of urbanization. The Project may also result in a local reduction of essential prey for American badger and desert kit fox including but not limited to burrowing rodents, insects, and reptiles species.

Why impact would occur: Impacts to American badger, desert kit fox and their habitat could result from vegetation clearing and other ground disturbances from infrastructure construction, and regular, rotating inundation of recharge basins that would affect approximately 1,200 acres of the site. Rotating inundation would temporarily remove up to 400 acres of the recharge basins from use as habitat at any one time, and is likely to occur on a quarterly (every 3 months) basis during wet years. Inundation of occupied American badger and desert kit fox habitat could flood active burrows resulting in mortality and loss of occupied habitat for these species and

their prey. Constructed basin berms may require periodic control of burrowing mammals and may include rodenticides or other chemical controls that could result in direct or secondary poisoning of American badger and desert kit fox. Rodent control activities could also reduce prey for American badger and desert kit fox foraging on the Project site.

Evidence impact would be significant: Project impacts may continue to result in substantial adverse effects, 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 CDFW or USFWS. Adverse impacts may continue to occur to American badger and desert kit fox because ongoing Project operations do not appear to warrant take avoidance surveys as described in BIO-2 in the DMND, especially during flooding and any rodent control activities.

Recommended Potentially Feasible Mitigation Measure(s):
Mitigation Measure #1: To reduce Project impacts to American badger and desert kit fox to less than significant, CDFW recommends that all survey efforts should be conducted prior to any Project disturbance activities including initial construction and ongoing operations including inundation of potential occupied burrows.

Mitigation Measure #2: Passive relocation of American badger and desert kit fox should not take place while young are still in dens and dependent on the parents for food, or while females may be pregnant, (either could directly cause death of pups). This most likely rules out passive relocation between mid-January through June or July, or until biologists can document that pups are independent enough to travel with the parents off-site. This is why it is imperative to know in advance how many burrows are within the Project construction and basin flooding footprint, how many are active and inactive, and what the construction schedule is for the Project, so adequate time is allowed for passive relocation planning and implementation.

Comment # 7: Impacts to Drainages

Issue: The DMND describes that although a formal jurisdictional delineation was not conducted on the Project site, the Project may require the removal of two intermittent drainages that were noted during reconnaissance visits to the site. The DMND does not include measures to avoid or mitigate for loss of streams on the Project site. Mitigation measure BIO-6 describes best management erosion and sediment control - measures that will be employed to prevent downstream dispersal of sediments during and following Project-related activities except during flood conditions. The DMND describes that flood flows would enter the site, go through the berms, overtop or destroy the berms in sequence, and eventually exit the Project site along the eastern boundary of the proposed Project in a manner similar to pre-Project conditions. CDFW generally concurs with measures described in the DMND to control off-site sediment releases to receiving downstream drainages. However, CDFW is concerned that the Project as described will result in the unmitigated loss of at least two ephemeral streams on the Project site and alteration of water flows into downstream reaches off the Project site.

Specific impacts: Impacts may include the alteration of existing runoff through the Project site and downstream of the Project site and degradation of water quality and associated watershed riparian function and biological resource habitat values.

Why impacts would occur: Ground disturbance activities and water impoundments on the Project site would physically remove or otherwise alter existing drainages on the Project site and associated riparian habitat. Floodwaters overtopping failed impoundment berms may send large volumes of water downstream.

Evidence impacts would be significant: The Project may substantially adversely affect the existing drainage pattern of the Project site through the alteration or diversion of a stream, which absent specific mitigation, could result in substantial erosion or siltation on site or off site of the Project.

Recommended Potentially Feasible Mitigation Measure(s):

Mitigation Measure #1: The Project will result in the alteration of a least two ephemeral drainages. For any such activities, the project applicant (or "entity") must provide written notification to CDFW pursuant to section 1600 et seq. of the Fish and Game Code. Based on this notification and other information, CDFW determines whether a Lake and Streambed Alteration Agreement (LSA) with the applicant is required prior to conducting the proposed activities. A notification package for a LSA may be obtained by accessing CDFW's web site at www.wildlife.ca.gov/habcon/1600.

CDFW's issuance of a LSA for a Project that is subject to CEQA will require CEQA compliance actions by CDFW as a Responsible Agency. As a Responsible Agency, CDFW may consider the CEQA document of the Lead Agency for the Project. However, the DMND does not meet CDFW's standard at this time. To minimize additional requirements by CDFW pursuant to section 1600 *et seq.* and/or
under CEQA, the CEQA document should fully identify the potential impacts to the stream or riparian resources and provide adequate avoidance, mitigation, monitoring and reporting commitments for issuance of the LSA.

Mitigation measure #2: Any LSA permit issued for the Project by CDFW may include additional measures protective of streambeds on and downstream of their Project including further erosion and pollution control measures. Additional mitigation conditioned in any LSA may include avoidance or on-site or off-site creation, enhancement or restoration and protection and management in perpetuity of mitigation lands to compensate for any on-site and off-site impacts to riparian resources.

Comment #8: Impacts to Wetlands

Issue: The DMND describes that the Project may require the removal of a potential seasonal wetland. It is not clear in the MND if the wetland is considered isolated or is associated with any on-site drainages. The DMND does not include avoidance or mitigation measures for loss of wetlands on the Project site.

CDFW is concerned that loss of wetlands on the Project site as described in the DMND will not be avoided or adequately mitigated for.

Specific impact: The Project may result in the loss of wetlands and associated biological diversity and watershed values associated with wetlands.

Why impacts would occur: Direct loss of wetland habitat from construction activates resulting in burial, diversion or other disturbances and dewatering practices directly affects water quality downstream and loss of associated biological resources habitat value.

Evidence impacts would be significant: The Project may have a substantial adverse effect on federally protected wetlands (including, but not limited to, marshes, vernal pools, coastal wetlands, and drainages) or waters of the United States, as defined by Section 404 of the federal Clean Water Act or California Fish and Game Code § 1600, et seq. through direct removal, filling, hydrological interruption, or other means.

Recommended Potentially Feasible Mitigation Measure(s):

Mitigation Measure #1: If the Project site supports wetlands subject to CDFW lake and streambed alteration regulatory authority (Fish & Game Code, § 1600 et seq.) mitigation measures should be addressed as described in Comment #7 above for *Impacts to drainages*. Project wetland association (connectivity) to Project site streams will be determined following a CDFW jurisdictional evaluation of the Project following the submittal of a LSA notification package for the Project as described in Comment #7.

Mitigation Measure #2: If CDFW determines that wetlands on the Project site are considered isolated and not subject to direct regulatory permit authority under Fish & Game Code, § 1600 et seq.), CDFW, as described in Fish & Game Code § 703(a) is guided by the Fish and Game Commission's policies. The Wetlands Resources policy (http://www.fgc.ca.gov/policy/) of the Fish and Game Commission "...seek[s] to provide for the protection, preservation, restoration, enhancement and expansion of wetland habitat in California. Further, it is the policy of the Fish and Game Commission to strongly discourage development in or conversion of wetlands. It opposes, consistent with its legal authority, any development or conversion that would result in a reduction of wetland acreage or wetland habitat values. To that end, the Commission opposes wetland development proposals unless, at a minimum, Project mitigation assures there will be "no net loss" of either wetland habitat values or acreage. The Commission strongly prefers mitigation which would achieve expansion of wetland acreage and enhancement of wetland habitat values".

The Wetlands Resources policy provides a framework for maintaining wetland resources and establishes mitigation guidance. CDFW encourages avoidance of wetland resources as a primary mitigation measure and discourages the development or type conversion of wetlands to uplands. CDFW encourages activities that would avoid the reduction of wetland acreage, function, or habitat values. Once avoidance and minimization measures have been exhausted, the Project must include mitigation measures to assure a "no net loss" of either wetland habitat values, or acreage, for unavoidable impacts to wetland resources. Conversions include, but are not limited to, conversion to subsurface drains, placement of fill or building of structures within the wetland, and channelization or removal of materials from the streambed. All wetlands and watercourses, whether ephemeral, intermittent, or perennial, should be retained and provided with substantial setbacks, which preserve the riparian and aquatic values and functions for the benefit to on-site and off-site wildlife populations. CDFW recommends mitigation measures to compensate for unavoidable impacts be included in the DEIR and these measures should compensate for the loss of function and value.

The Fish and Game Commission's Water policy guides CDFW to [insure] the quantity and quality of the waters of this state should be apportioned and maintained respectively so as to produce and sustain maximum numbers of fish and wildlife; to provide maximum protection and enhancement of fish and wildlife and their habitat; encourage and support programs to maintain or restore a high quality of the waters of this state, and prevent the degradation thereof caused by pollution and contamination; and endeavor to keep as much water as possible open and accessible to the public for the use and enjoyment of fish and wildlife. CDFW recommends avoidance of water practices and structures that use excessive amounts of water, and minimization of impacts that negatively affect water quality, to the extent feasible.

Comment #9: Closely Related Past, Present, and Reasonably Foreseeable Probable Future Projects

Issue: Page 24 of the IS states, "The Project would impact approximately 1,280 acres of potentially suitable foraging and sheltering habitats utilized by native wildlife species." and "However, similar native and naturalized vegetated habitats are common throughout the region and do occur on adjacent properties, and the proposed Project represents a relatively small portion of these areas."

CDFW is concerned that the Project does not acknowledge the cumulative loss of habitat for biological resources considering the large size of the Project in light of ongoing rapid urbanization occurring in the Antelope Valley including the proliferation of large industrial scale renewable solar energy developments and the proposed massive Centennial Ranch development in the western Antelope Valley.

Specific impact: As stated on page 24 of the IS, "Long-term permanent impacts includes Impacted habitats include native fiddleneck fields and rubber rabbitbrush scrub, and non-native annual grasslands, which are used by burrowing rodents, carnivorous and scavenging mammal species, passerines, raptors, and various reptiles. In addition to common wildlife species, special-status species with potential to be impacted by this habitat modification and loss include American badger (a California Species of Special Concern [CSC]), desert kit fox (species of local concern), western burrowing owl (CSC and USFWS Bird of Conservation Concern [BCC]), tricolored blackbird (CSC and a State Candidate for listing), and Crotch bumble bee (CDFW Special Animal)".

Why impact would occur: As is typical for the majority of development projects in the Antelope Valley resulting in removal of biological resource habitats, the Project would result in further similar losses on a potential significant level under CEQA. Project impacts to biological resources would occur from vegetation clearing and other ground disturbances from infrastructure construction, and regular, rotating inundation of recharge basins that would affect approximately 1,200 acres of the site. Rotating inundation would temporarily remove up to 400 acres of the recharge basins from use as habitat at any one time, and is likely to occur on a quarterly (every 3 months) basis during wet years. Inundation of occupied habitat for special status species habitat could flood active burrows, nests and foraging habitat resulting in mortality and loss of occupied habitat for biological resources. Constructed basin berms may require periodic control of burrowing mammals and may include rodenticides or other toxic chemical controls that could result in direct or secondary pensioning of non-target special status predator species such as but not limited to burrowing owl, American Badger, desert kit fox, and golden eagle and reduce prey for these species.

Evidence impact would be significant: The Project may have cumulative potential to degree quality of environment, substantially reduce habitat for a fish or wildlife species, cause fish or wildlife populations to drop below self-sustaining levels.

Recommended Potentially Feasible Mitigation Measure

Mitigation measure #1: CDFW recommends that AVEK prepare an Environmental Impact Report (EIR) for the Project. An EIR would analyze significant cumulative impacts contributed by the Project and propose alternatives to the Project that could reduce cumulative impacts below a significant level under CEQA. The cumulative impact analysis should also include existing and proposed AVEK Project that are in the Antelope Valley that impact biological resource species and habitats.

Mitigation measure #2: AVEK could condition habitat preservation and enhancement on the Project site or off-site preservation in the Antelope Valley that would result in habitat of equal or superior value. Mitigation ratio may be discussed further with CDFW. Mitigation lands should be protected in perpetuity and managed by a local land conservancy.

Editorial Comments and/or Suggestions

Comment #1: Salvage and avoidance of common wildlife species

In addition to the Project, avoidance measures described in the DMND and recommend by CDFW for special status species, CDFW recommends a biological monitor be present on the Project site before and during initial grubbing and grading and other operations to direct the salvage of common wildlife species of low mobility or of increased vulnerability from den destruction or flooding. Salvaged wildlife of low mobility should be removed and placed onto adjacent habitat out of harm's way. Coyote (*Canis latrans* dens should be inspected and not be disturbed during the pupping season or when otherwise occupied unless absence is confirmed. In arid environments, fossorial mammal den burrows may also harbor roosting habitat for bats. Burrows should be inspected for bats and not disturbed until confirmed unoccupied. Grubbing and grading should be done to avoid islands of habitat where wildlife may take refuge and may later be killed by heavy equipment. Grubbing and grading should be done from the center of the Project site, working outward towards adjacent habitat off site where wildlife may safely escape.

Comment #2: Fencing Hazards

The Project may result in the use of open pipes used as fence posts, property line stakes, signs, etc. **CDFW recommends that** all hollow posts and pipes be capped to prevent wildlife entrapment and mortality because these structures mimic the natural cavities preferred by various bird species and other wildlife for shelter, nesting and roosting. Raptor's talons can become entrapped within the boltholes of metal fence stakes resulting in mortality. Metal fence stakes used on the Project site should be plugged with bolts or other plugging materials to avoid this hazard. Further information on this subject may be found at: http://kern.audubon.org/death_pipes.htm.

FILING FEES

The Project, as proposed, would have an impact on fish and/or wildlife, and assessment of filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW. Payment of the fee is required in order for the underlying project approval to be operative, vested, and final. (Cal. Code Regs, tit. 14, § 753.5; Fish & G. Code, § 711.4; Pub. Resources Code, § 21089).

CONCLUSION

CDFW appreciates the opportunity to comment on the DMND to assist AVEK in identifying and mitigating Project impacts on biological resources. CDFW recommends addressing the information raised in this letter in an EIR. CDFW also recommends the AVEK consult with CDFW regarding these issues.

Questions regarding this letter and further coordination on these issues should be directed to Scott Harris at (805) 644 6305 or scott.p.harris@wildlife.ca.gov

Sincerely,

Betty J. Courtney
Environmental Program Manager I
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26 September 2017

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Subject: Re: CDFW Comments Regarding the High Desert Water Bank (Project) Initial Study (IS) and Draft Mitigated Negative Declaration (DMND), SCH#2017061030

Dear Ms. Courtney,

On behalf of Antelope Valley-East Kern Water Agency (AVEK), AECOM Technical Services, Inc. (AECOM) respectfully submits this letter responding to comments submitted by the California Department of Fish and Wildlife (CDFW) for the High Desert Water Bank Project (Project), located in the western Antelope Valley in northern Los Angeles County, California. This letter addresses CDFW comments regarding the Project Initial Study (IS) and Draft Mitigation Negative Declaration (Draft MND), which were submitted to AVEK in a letter dated July 13, 2017 (Attachment 1).

AVEK, as the lead Agency, recognizes the CDFW's role as a Responsible Agency to consider and evaluate environmental impacts associated with this Project for your decision-making process (15096(f)). As such, we appreciate the CDFW's input on the Project's IS and Draft MND. In consideration of the CDFW's input, the project has been modified as follows:

- In response to CDFW concerns about loss of habitat for several special-status species including Swainson's hawk (*Buteo swainsoni*), tri-colored blackbird (*Agelaius tricolor*), and burrowing owl (*Athene cunicularia*), AVEK proposes to reduce the area of percolation basin land and to conserve native or naturalized habitats on a portion of the 1,500 Project site. The specifics of these conserved lands are in development, but this area is intended to provide year-round foraging and breeding habitat for burrowing owl, American badger (*Taxidea taxus*), and desert kit fox (*Vulpes macrotis*), foraging habitat for Swainson's hawk, and potentially nesting season foraging habitat for tricolor blackbird, as well as habitat for other native wildlife species including nesting migratory birds. The proposed habitat management lands also will protect wetland and drainage features on the Project site to the extent feasible.

- In order to accommodate the CDFW's request for focused surveys for special-status plant species, Swainson's hawks, and tricolored blackbird nesting habitat while meeting milestones in Project construction, AVEK proposes to conduct construction on a phased schedule. Construction of the permanent infrastructure, including the turnouts, groundwater wells, monitoring wells, and booster pump station, and rehabilitation of the existing turnout, will begin

in early 2018. These permanent impacts will total approximately 12 acres. Construction of the percolation basins across approximately 1,100 acres of the site will not commence until late summer 2018, following completion of the requested focused surveys. This approach will minimize habitat impacts until surveys are completed, and allow the Project to avoid costly schedule delays.

The IS and MND are being modified to reflect these changes to the Project description. We believe that incorporation of these modifications will allow the MND to be presented to the Agency for adoption in accordance with Section 15074 of the CEQA Guidelines.

Additionally, AVEK wishes to clarify that of the 1,500-acre site, the Project includes only approximately 12 acres of new permanent habitat impacts consisting of permanent wells and infrastructure. Approximately 322 acres will be set aside as habitat management lands. Percolation basins will encompass the remaining approximately 1,138 acres. The Project includes 1,138 acres of temporary impacts due to percolation basin construction and operations.

The majority of impacts are temporal in nature, associated with inundation of the percolation basins on a rotating basis. Inundation will occur only during years where water supply exceeds demand. Due to the natural cycle of wet and dry years in California, inundation is not anticipated to occur every year. Thus, in many years, the majority of the site will be available for use by native wildlife as sheltering, breeding, and foraging habitat. Even when inundation occurs, on average no more than one third of the footprint (approximately 400 acres) will be inundated at any one time.

Specific CDFW comments and AECOM responses are addressed below.

CDFW Comment #1 – Impacts to Special Status Plant Species

CDFW is concerned that botanical surveys conducted on the Project site warrant further effort in order to adequately inform avoidance or mitigation measures for special status plant species.

Response: AVEK understands and appreciates the CDFW's concern for special status plant species on the Project site. Specific concerns and suggestions are addressed below.

Mitigation Measure #1: CDFW recommends focused botanical surveys be conducted on the Project site to maximize the potential for documenting special status plant species, and to avoid or mitigate for Project impacts to special status botanical resources below a level of significance under CEQA. CDFW recommends that any focused botanical surveys be conducted following CDFW's Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (Survey Protocols).

Response: The *Antelope Valley-East Kern Water Agency High Desert Water Bank Project Biological Technical Report* (Biological Technical Report; AECOM 2017) prepared for the IS included analysis on the potential for special status plant species based on historic occurrence and habitats present. Based on the habitats present and the results of the California Natural Diversity Database (CNDDB) and California Native Plant Society (CNPS) database review, it is not anticipated that special status plant species occur

on the Project site. However, in order to document the presence or absence of special status plant species, AVEK will commit to the performance of floristic botanical surveys of the Project Site during the appropriate season in spring and summer 2018, prior to construction of the percolation basins. Surveys will be conducted following the CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (*CDFW 2009). The requirement for surveys to be conducted and specific measures to be implemented should special status plants be discovered will be added as a new mitigation measure, Mitigation Measure BIO- 7, to the MND.

Mitigation Measure #2: CDFW recommends that the CEQA document for the Project provide a discussion on the presence or absence of special status plant species and Project impacts, avoidance and mitigation measures such as off-site acquisition and protection of occupied habitat.

Response: Following completion of the floristic surveys as described above, an addendum to the Biological Technical Report will be prepared, summarizing the results of the surveys and documenting the occurrence of any special status plants observed on the site. The need for compensatory mitigation for special status plant species will be determined based on the findings in that addendum.

CDFW Comment #2 – Impacts to Desert Tortoise

CDFW is concerned that presence of this species on the Project site may have been missed and will not be considered in future Project construction and operation activities in order to determine Project impact, avoidance and mitigation measures for this species.

Response: AVEK appreciates the CDFW's concern for impacts to the state- and federally-listed desert tortoise within the Mojave Desert; however, certain statements are unclear and clarification is requested in order to properly address the CDFW's concerns.

In its comment, the CDFW states, "Although the IS stated that protocol level surveys were not conducted for special status wildlife species on the Project site and explains that that desert tortoise presence **were observed** [emphasis added] (scat, tracks, egg shell fragments, burrows/pallets, shell/bone/scutes, or courtship rings) during the Project field observations." The IS did not claim evidence of desert tortoise presence was detected at the Project site. Further, the CDFW states "The IS concluded that because all habitat within the Project Area is of poor quality for desert tortoises, it is unlikely that they would occur within the Project Area or its vicinity." Due to the absence of evidence of potential desert tortoise habitat present at the site or that desert tortoise presence should be considered, the Biological Technical Report did not identify desert tortoise as a focus species. AVEK requests that the CDFW clarify the positive identification of desert tortoise sign stated in CDFW's July 13, 2017 letter, as no signs of desert tortoise or any indication of utilization of the Project site by these species were made in the AVEK documents, and the IS did not contain any statements regarding desert tortoise observations on the Project site.

AVEK also requests the CDFW indicate the source it is relying on to determine the range for desert tortoise. The desert tortoise range map available through the California Wildlife Habitat Relationship System provides the range on a statewide level which does not have sufficient detail to determine if the

site lies within the range presented; however, the site is outside of the current desert tortoise range map presented in the U.S. Fish and Wildlife Service Environmental Conservation Online System (https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=C04L). Additionally, a U.S. Geological Survey study conducted by Nussear *et al.* that modeled desert tortoise habitat in the Mojave and Sonoran Deserts (2009) indicated the Project site is outside the western edge of occupied desert habitat, and is adjacent to very low quality habitat for this species. This study is cited in the U.S. Fish and Wildlife Service *Revised Recovery Plan for the Mojave Population of the Desert Tortoise (Gopherus agassizii*). No CNDDB records are known within the Project USGS 7.5-minute quadrangle, or any adjacent 7.5-quadrangle. The nearest documented DT occurrence was recorded in 2010 within the Tylerhorse Canyon USGS 7.5-minute quadrangle, approximately 10.47 miles northeast of the Project site. The next nearest occurrence is approximately 20.9 miles northeast of the Project site and was recorded in 2006 in the Willow Springs quad. For these reasons, AVEK believes the likelihood that desert tortoise occur on the Project site is negligible.

Mitigation Measure #1: To reduce impacts to less than significant, CDFW recommends that focused protocol surveys should be conducted for desert tortoise prior to Project ground disturbances and throughout the life of the Project operations. CDFW recommends the implementation of timely surveys using the current Service protocol "Preparing for any action that may occur within the range of the Mojave Desert Tortoise".

Response: As discussed above, AVEK believes there is negligible potential for desert tortoise to occur on the Project based on the habitat modelling and range provided by the USFWS and USGS, CNDDB records of occurrence, and habitat types present within the Project site. Therefore, protocol-level surveys for this species are not planned at this time.

Mitigation Measure #2: Erecting United States Fish and Wildlife Service approved exclusionary fencing around the Project site for desert tortoise will restrict desert tortoise from entering the Project site if protocol surveys resulted in negative results. Fencing will avoid the necessity of repeating surveys on an annual basis.

Response: AVEK understands that erection of U.S. Fish and Wildlife Service (USFWS) approved exclusionary fencing around the Project site would restrict desert tortoise from entering the Project site should this species occur in the vicinity. However, as discussed, AVEK believes there is negligible potential for desert tortoise to occur based on the habitat model and range provided by the USGS, historic occurrence records provided in the CNDDB, and the habitat types present within the Project site and in the vicinity. For this reason, exclusionary fencing for desert tortoise is not planned at this time. Should desert tortoise be observed within the Project site or on adjacent properties, suitable protective measures including exclusionary fencing will be installed.

Mitigation Measure #3: Take of desert tortoise is prohibited, except as authorized by state law (Fish and Game Code,§§ 2080, 2085.) Consequently, if the Project, Project construction, or any Project-related activity will result in take of desert tortoise under CESA, CDFW recommends that the Project proponent seek appropriate take authorization under CESA prior to implementing the Project because

this authorization will be required if tortoise relocation off-site or other unavoidable take will be necessary during anytime during the life of the Project.

Response: AVEK understands that any disturbance, including relocation, of desert tortoise will require issuance of an Incidental Take Permit issued by the CDFW as well as authorization by the U.S. Fish and Wildlife Service. No disturbance or take of any desert tortoise will occur without issuance of such a permit. However, given the extremely low potential for this species to occur on the Project site, as discussed above, AVEK does not believe it is necessary to preemptively obtain such a permit.

CDFW Comment #3 – Impacts to Swainson's Hawk

CDFW is concerned the DMND may not have fully characterized the extent of Project impacts to Swainson's hawk (Buteo swainsoni), a species listed as threatened under CESA.

Response: The Applicant understands and appreciates the CDFW's concern for impacts to the state-listed Swainson's hawk. Specific concerns are addressed below.

Mitigation Measure #1: CDFW recommends Project take avoidance of Swainson's hawk and loss of their foraging habitat. To reduce Project impacts to Swainson's hawk to less than significant under CEQA, CDFW recommends AVEK require focused Swainson's hawk surveys be conducted to fully analyze the potential for Project impacts, avoidance and mitigation measures prior to certification of the CEQA document.

Response: In order to document the presence of Swainson's hawk in the vicinity of the Project site, AVEK agrees to conduct focused Swainson's hawk surveys following the protocol outlined in *Swainson's Hawk Survey Protocols, Impact Avoidance, and Minimization Measures for Renewable Energy Project in the Antelope Valley of Los Angeles and Kern Counties, California* (CDFW 2010). These surveys will be added as a new mitigation measure, Mitigation Measure BIO-8, to the MND and will be completed prior to inundation of the percolation basins. An addendum to the Biological Technical Report will be prepared to document the results of those surveys, and will be submitted to the CDFW upon completion.

Responding to the need to analyze potential impacts to Swainson's hawk, the modified MND will expand on the prior analysis. As protocol surveys cannot take place until early 2018, an analysis assuming presence of one or two nesting pair within five miles of the project site will be performed. Given that the average territory per breeding pair equals approximately 2.5 square miles (1,600 acres), and on average only approximately 400 acres will be inundated at a time, it is not anticipated that more than this number of individuals will be impacted by the Project at any one time. The analysis will consider the temporal footprint of the disturbance, the periodicity of inundation due to seasonal and annual changes in water availability, the amount of temporarily impacted foraging land in consideration of the surrounding habitat, the potential increase in prey due to berm structures, and other factors potentially impacting Swainson's hawks.

Mitigation Measure # 2: The unavoidable take of Swainson's haw (sic) *is prohibited except as authorized by state law (Fish and Game Code, §§ 2080, 2085.). If the Project will result in unavoidable take of Swainson's hawk, further consultation with the CDFW for issuance of any ITP under CESA would be required before any Project impacts resulting in take could occur.*

Response: The Applicant understands that take of Swainson's hawk is prohibited except as authorized by a CDFW-issued ITP. The Project is not expected to result in take of Swainson's hawk. AVEK's review of the Fish and Game Code sections cited by CDFW does not indicate that the Project's construction or operational activities will result in take of this species.

Mitigation Measure #3: Type conversion of Swainson's hawk foraging habitat within a 5-mile radius of an active Swainson's hawk nest should be avoided to maximize Swainson's hawk prey habitat availability and nesting survival. CDFW also recommends AVEK seek an ITP for any Project related loss of Swainson's hawk foraging habitat within a 5 miles radius of an active nest. If loss of Swainson's hawk foraging habitat cannot be avoided by the Project, CDFW recommends the development of a mitigation plan that should focus on providing habitat management lands.

Response: As discussed, the Applicant intends to provide on-site habitat management lands to provide foraging habitat for Swainson's hawk and other species to minimize impacts. Specifics of this plan are in development, but the plan will include habitat elements important to foraging Swainson's hawks.

In addition to these permanently undeveloped areas, habitat removal due to inundation is temporary and will occur only in years when water supply is sufficiently high to exceed demand. Even during periods of inundation, only up to one third of the basins will be inundated at any one time; the majority of the site will remain available for foraging by Swainson's hawks. During dry periods, passive recolonization of the basins is likely to favor annual herbs and grasses of similar composition to naturalized grasslands currently present throughout the site.

Responding to the need to analyze potential impacts to Swainson's hawk, the revised MND will expand on the prior analysis, as described above.

The Project is not expected to result in take of Swainson's hawk. AVEK's review of the Fish and Game Code sections cited by CDFW does not indicate that the Project's construction or operational activities will result in take of this species.

<u>CDFW Comment #4 – Impacts to Tricolored Blackbird</u>

CDFW is concerned that BIO-3 is insufficient to prevent Project direct or indirect take of tricolored blackbird and their foraging habitat when nesting on or adjacent to the Project site.

Response: The Applicant understands the CDFW's concern for tricolored blackbird. As stated in the Biological Technical Report (AECOM 2017), suitable nesting habitat does not occur on the Project site; therefore direct take of tricolored blackbird nests and breeding individuals will not occur as a result of Project construction or operation. Tricolored blackbirds were observed foraging on an adjacent active agricultural property south of the California Aqueduct in April 2017; no signs of nesting were observed

at that time and no tricolored blackbirds were observed on the Project site. Specific concerns are addressed below.

Mitigation Measure #1: To reduce Project impacts to tricolored blackbird to less than significant, CDFW recommends the Lead Agency require focused tricolored blackbird surveys during the nesting season to fully analyze the potential for Project impacts and inform avoidance and mitigation measures prior to certification of the CEQA document. Surveys should include potential nesting and nesting season foraging habitats on the Project site and within three miles from the Project site for any nesting colony that may forage on the Project site.

Response: As discussed, no potential nesting sites occur on the Project site for this species. However, the Applicant agrees to conduct one focused tricolored blackbird survey of potentially suitable nesting habitat within a 3-mile radius of the Project site during the breeding bird season (February 15 through September 15). Surveys will be conducted prior to construction of the percolation basins. The results of the surveys will be documented in an addendum to the Biological Technical Report and submitted to the CDFW upon completion. These surveys will be added as a new mitigation measure, Mitigation Measure BIO-10, to the MND.

Responding to the need to analyze potential impacts to tricolored blackbird, the modified MND will expand on the prior analysis. As protocol surveys cannot take place until early 2018, an analysis will be performed assuming nesting occurs within three miles of the Project. The analysis will consider the temporal footprint of the disturbance, the periodicity of inundation due to seasonal and annual changes in water availability, the amount of temporarily impacted foraging land in consideration of the surrounding habitat, the potential increase in prey due to berm structures, and other factors potentially impacting tricolored blackbirds.

Mitigation Measure # 2: CDFW recommends that the Project avoid flooding, draining or otherwise disturbing occupied tricolored blackbird nesting and foraging habitat on the Project site during the nesting season.

Response: As discussed, no suitable nesting habitat for tricolored blackbird occurs on the Project site. Temporary inundation of the percolation basins is not expected to support the establishment of hydrophytic vegetation that could provide such habitat. Thus, no flooding, draining, or other disturbance to nesting habitat during or outside of the nesting season is anticipated due to the Project operations.

Inundation of the percolation basins is based on water availability and demand, and may occur at any time of the year, although winter and spring are the most likely. Although portions of the site may be flooded, on average only up to one third of the basins (approximately 400 acres) will be inundated at any one time; the remaining 1,100 acres of the site will be available as foraging habitat. Further, AVEK intends to designate a portion of the site as habitat management lands to provide foraging habitat for tricolored blackbirds and other species. Thus, although portions of the site may be temporarily unavailable as foraging habitat due to inundation, these impacts are temporary and not expected to be significant.

Mitigation Measure #3: The unavoidable take of tricolored blackbird and their nesting season foraging habitat within three miles of an active nesting colony is prohibited except as authorized by state law (Fish and Game Code, §§ 2080, 2085.). If the Project will result in unavoidable impacts to tricolored blackbird, further consultation with the CDFW under CESA would be required before the Project impacts resulting in take may occur.

Response: As discussed, focused tricolored blackbird nesting surveys will be conducted within a 3-mile radius of the Project in order to identify active nesting colonies. The Applicant understands that take of tricolored blackbird is prohibited except as authorized by a CDFW-issued ITP. The Project is not expected to result in take of tricolored blackbird. AVEK's review of the Fish and Game Code sections cited by CDFW does not indicate that the Project's construction or operational activities will result in take of this species.

Mitigation Measure # 4: Any ITP issued by the CDFW for the unavoidable direct or indirect take of tricolored blackbird or their occupied nesting and foraging habitat may condition acquisition and protection in perpetuity of tricolored blackbird nesting and foraging habitat near the Project site in appropriate habitat. A conservation easement should be recorded over the mitigation land and managed by a local land conservancy.

Response: AVEK does not agree that an ITP is necessary or required under the CESA due to the construction or operation of the Project.

<u>CDFW Comment #5 – Impacts to Burrowing Owl</u>

CDFW concurs with the DMND that unmitigated adverse Project impacts to burrowing owl could be significant under CEQA and that burrowing owl surveys and mitigation measures should be conducted following CDFW's guidelines. However, CDFW is concerned that the proposed trigger for performing burrowing owl surveys appears to be narrowly focused primarily on initial Project construction activities.

Response: AVEK understands the CDFW's concerns regarding impacts of regular Project operations on occupied burrowing owl burrows where such burrows occur within the percolation basins scheduled for inundation. To address these concerns, Mitigation Measure BIO-1 will be revised. AVEK will prepare a *Burrowing Owl Protection Plan* for the Project, which will be submitted to the CDFW for review and approval and will be implemented prior to grading for the percolation basins or inundation. The *Burrowing Owl Protection Plan* will include a varied set of potential protective measures that provide a framework for burrowing owl protection during the operations phase of the Project.

Mitigation Measure #1: To reduce Project impacts to burrowing owl to less than significant, CDFW recommends that the Project adhere to CDFW's March 7, 2012. Staff Report on Burrowing Owl Mitigation as referenced in the DMND. All survey efforts should be conducted prior to any Project habitat disturbance activities including initial construction and ongoing operations including inundation of potential burrowing owl habitat for the life of the Project.

Response: In response to CDFW concerns about protections for occupied burrowing owl burrows, AVEK has revised Mitigation Measure BIO-1 to include pre-inundation burrowing owl clearance surveys in addition to pre-construction surveys. Two (2) weeks prior to inundation of the percolation basins, trained-AVEK staff will review the inundation area for evidence of burrowing owl presence. Any suspect indications of potential burrowing owl presence will be further investigated by qualified biologist. This process is modeled after environmental coordinator program employed by Chevron throughout their San Joaquin Valley Floor operations. Buffers will be established following the guidance provided in the *Staff Report on Burrowing Owl Mitigation* and as described in the Draft MND.

Mitigation Measure #2: Permanent impacts to occupied burrowing owl burrows and adjacent foraging habitat should be mitigated for by setting aside replacement habitat to be protected in perpetuity under a conservation easement dedicated to a local land conservancy. A burrowing owl mitigation plan should be submitted to CDFW for review and approval prior to Project implementation.

Response: As described above, AVEK proposes Project revisions including a reduction in the size and extent of the percolation basins by designating approximately 322 acres of grassland and shrubland as habitat management lands. On-site habitat management lands will be managed to the benefit of native wildlife, including burrowing owl. Also, as described, a Burrowing Owl Protection Plan will be prepared prior to construction of the percolation basins.

AVEK stresses that the Project includes only 12 acres of permanent habitat impacts. The majority of impacts are temporal in nature, associated with inundation of the percolation basins on a rotating basis. In many years, the majority of the site will be available for use by burrowing owls as sheltering, breeding, and foraging habitat. Even when inundation occurs, on average no more than one third of the basins (approximately 400 acres) will be inundated at any one time. Further, construction of the berms surrounding the percolation basins is expected to attract and encourage small mammals, especially California ground squirrels (*Otospermophilus beecheyi*), which may provide additional suitable burrows for burrowing owls.

<u>CDFW Comment #6 – Impacts to American Badger and Desert Kit Fox</u>

CDFW generally concurs with the survey and take avoidance measures described in the DMND for desert kit fox and American badger. However, CDFW is concerned that the proposed trigger for performing surveys appears to be narrowly focused primarily on initial Project construction activities. CDFW believes that in addition to initial Project construction, other ongoing Project operation and maintenance activities could also significantly adversely affect desert kit fox and American badger.

Response: AVEK understands the CDFW's concerns regarding impacts of regular Project operations on occupied American badger and desert fox dens where such dens occur within the percolation basins scheduled for inundation. Revisions to Mitigation Measure BIO-2 have been made to strengthen American badger and desert kit fox protections in response to these concerns (see Mitigation Measure #1 response).

Mitigation Measure #1: To reduce Project impacts to American badger and desert kit fox to less than significant, CDFW recommends that all survey efforts should be conducted prior to any Project disturbance activities including initial construction and ongoing operations including inundation of potential occupied burrows.

Response: In response to CDFW concerns about protections for occupied American badger and desert kit fox dens, AVEK has revised Mitigation Measure BIO-2 to include pre-inundation American badger and desert kit fox clearance surveys in addition to pre-construction surveys. Two (2) weeks prior to inundation of the percolation basins, trained-AVEK staff will review the inundation area for evidence of American badger and/or desert kit fox presence. Any suspect indications of potential presence will be further investigated by qualified biologist. This process is modeled after environmental coordinator program employed by Chevron throughout their San Joaquin Valley Floor operations. All suitable denning locations shall be investigated for use. The discussion of potential impacts within the DMND will be amplified to discuss additional analysis. Active, non-natal dens will be avoided as feasible; where avoidance is not possible, passive relocation will be encouraged. Active dens during pupping season will be avoided with suitable buffers.

Mitigation Measure #2: Passive relocation of American badger and desert kit fox should not take place while young are still in dens and dependent on the parents for food, or while females may be pregnant, (either could directly cause death of pups).

Response: AVEK understands that relocation efforts of any kind, including passive relocation, should not be utilized for natal dens. Where active, natal dens are observed, buffers will be established and inundation or maintenance activities will not occur in these areas. Passive relocation will not be employed with natal American badger or desert kit fox dens.

CDFW Comment #7 – Impacts to Drainages

CDFW is concerned that the Project as described will result in the unmitigated loss of at least two ephemeral streams on the Project site and alteration of water flows into downstream reaches off the Project site.

Response: In order to determine the extent of State waters within the Project site, an informal assessment to identify potential features was conducted in March and April 2017 and a formal jurisdictional and wetland delineation was conducted on September 6 and 7, 2017. A Jurisdictional Delineation Report is being prepared.

Mitigation Measure #1: The Project will result in the alteration of a least two ephemeral drainages. For any such activities, the project applicant (or "entity") must provide written notification to CDFW pursuant to section 1600 et seq. of the Fish and Game Code. Based on this notification and other information, CDFW determines whether a Lake and Streambed Alteration Agreement (LSA) with AVEK is required prior to conducting the proposed activities.

Response: AVEK intends to protect all jurisdictional waters on the Project site within habitat management lands. Should impacts to jurisdictional drainages occur, AVEK will provide written notification to the CDFW via completion of the LSA permit application pursuant to section 1600 *et seq.* of the Fish and Game Code, which will be submitted prior to commencement of construction activities within jurisdictional drainages.

Mitigation measure #2: Any LSA permit issued for the Project by CDFW may include additional measures protective of streambeds on and downstream of their Project including further erosion and pollution control measures. Additional mitigation conditioned in any LSA may include avoidance or on-site or off-site creation, enhancement or restoration and protection and management in perpetuity of mitigation lands to compensate for any on-site and off-site impacts to riparian resources.

Response: AVEK understands that any issued LSA will contain avoidance, minimization, and mitigation measures to reduce impacts to State-jurisdictional waters, and agrees to abide by the measures described in any LSA permit issued for the Project.

CDFW Comment #8 – Impacts to Wetlands

CDFW is concerned that loss of wetlands on the Project site as described in the DMND will not be avoided or adequately mitigated for.

Response: AVEK understands that an issued LSA will contain avoidance, minimization, and mitigation measures to reduce impacts to State-jurisdictional waters.

Mitigation Measure #1: If the Project site supports wetlands subject to CDFW lake and streambed alteration regulatory authority (Fish & Game Code, § 1600 et seq.) mitigation measures should be addressed as described in Comment #7 above for Impacts to drainages. Project wetland association (connectivity) to Project site streams will be determined following a CDFW jurisdictional evaluation of the Project following the submittal of a LSA notification package for the Project as described in Comment #7.

Response: In order to determine the extent of State waters within the Project site, an informal assessment to identify potential features was conducted in April 2017, which identified potential CDFW-jurisdictional wetlands. A formal jurisdictional and wetland delineation was conducted of these features on September 6, 2017. A Jurisdictional Delineation Report is being prepared. AVEK will submit an LSA application for impacts to CDFW-jurisdictional wetlands as applicable and will complete mitigation as required therein.

Mitigation Measure #2: … "Further, it is the policy of the Fish and Game Commission to strongly discourage development in or conversion of wetlands. It opposes, consistent with its legal authority, any development or conversion that would result in a reduction of wetland acreage or wetland habitat values. To that end, the Commission opposes wetland development proposals unless, at a minimum, Project mitigation assures there will be "no net loss" of either wetland habitat values or

acreage. The Commission strongly prefers mitigation which would achieve expansion of wetland acreage and enhancement of wetland habitat values".

Response: AVEK understands that completion of an LSA and/or subsequent mitigation may be required if impacts will occur due to Project-related activities.

CDFW Comment #9 – Closely Related Past, Present, and Reasonably Foreseeable Probable Future Projects

CDFW is concerned that the Project does not acknowledge the cumulative loss of habitat for biological resources considering the large size of the Project in light of ongoing rapid urbanization occurring in the Antelope Valley including the proliferation of large industrial scale renewable solar energy developments and the proposed massive Centennial Ranch development in the western Antelope Valley.

Response: AVEK acknowledges the CDFW's concern about cumulative impacts, especially regarding the proposed Centennial Ranch development in the vicinity of the Project. Loss of habitat due to the Project is not expected to be significant, however, because permanent impacts are small in area (approximately 12 acres of the total 1,500-acre Project site), and impacts associated with Project operations are temporal in nature and include only a portion of the site at any one time. Further, AVEK intends to conserve a portion of the site to provide habitat for native wildlife and plant species, as described previously.

Mitigation measure #1: CDFW recommends that AVEK prepare an Environmental Impact Report (EIR) for the Project.

Response: AVEK acknowledges the CDFW's request for an EIR, but feels that Project-related impacts to biological resources can be addressed under an MND.

Mitigation measure #2: AVEK could condition habitat preservation and enhancement on the Project site or off-site preservation in the Antelope Valley that would result in habitat of equal or superior value. Mitigation ratio may be discussed further with CDFW. Mitigation lands should be protected in perpetuity and managed by a local land conservancy.

Response: As discussed, AVEK intends to set aside a portion of the site as habitat management lands to be managed for the benefit of native plant and wildlife species. The details of this plan are in development, but will include preservation of native and naturalized habitats on-site, as described above. AVEK plans to consult with the CDFW to reach consensus on the details of these managed lands.

AECOM

CDFW Editorial Comments And/Or Suggestions

CDFW Comment #1 – Salvage and Avoidance of Common Wildlife Species

CDFW recommends a biological monitor be present on the Project site before and during initial grubbing and grading and other operations to direct the salvage of common wildlife species of low mobility or of increased vulnerability from den destruction or flooding.

Response: AVEK appreciates the CDFW's concern for common wildlife species. Identification of common species will occur during pre-construction surveys. This coupled with the relatively slow pace of disturbance activities will lessen to these common species.

CDFW Comment #2 – Fencing Hazards

CDFW recommends that all hollow posts and pipes be capped to prevent wildlife entrapment and mortality because these structures mimic the natural cavities preferred by various bird species and other wildlife for shelter, nesting and roosting. Raptor's talons can become entrapped within the boltholes of metal fence stakes resulting in mortality. Metal fence stakes used on the Project site should be plugged with bolts or other plugging materials to avoid this hazard.

Response: AVEK understands the risk that hollow posts and pipes can pose for native wildlife. Protective measures suggested by the CDFW to minimize or avoid these risks will be implemented at the Project site to the extent feasible in order to protect raptors and other wildlife.

Summary and Conclusion

We believe that the information and responses provided in this letter adequately respond to the issues raised by CDFW. Accordingly, we believe that the MND, so modified, can be adopted by AVEK in accordance with Section 15074 of the CEQA Guidelines. Further, we believe that addressing these comments will not require recirculation of the Draft MND, as no substantial revisions to the Draft MND are required (reference Section 15073.5(c) of the CEQA Guidelines).

AVEK would like to meet with CDFW to discuss their comment letter and these responses. We will be contacting you in the near future to schedule this meeting.

Should you have any questions regarding this submittal, please contact Wayne Vogler at (805) 938-5383 or via email at wayne.vogler@aecom.com.

Sincerely,

AECOM Technical Services, Inc.

Wayne Vogler

Wayne Vogler
Natural Resource Scientist

Water Boards

Lahontan Regional Water Quality Control Board

late 7/13/17

August 4, 2017

File: Environmental Doc Review
Los Angeles County

Dwayne Chisam, PE, General Manager
Antelope Valley-East Kern Water Agency
6500 West Avenue N
Palmdale, CA 93551
Email: mflood@avek.org

Comments on the Notice of Completion of an Initial Study and Mitigated Negative Declaration for the High Desert Water Banking Project, Los Angeles County, State Clearinghouse Number 2017061030

The California Regional Water Quality Control Board, Lahontan Region (Water Board) staff received the Initial Study and Mitigated Negative Declaration (IS/MND) for the above-referenced project (Project) on July 21, 2017. The IS/MND, prepared by Antelope Valley – East Kern Water Agency (AVEK) was submitted in compliance with provisions of the California Environmental Quality Act (CEQA) in order to solicit input on the potential impacts on the environment and ways in which those significant effects are proposed to be avoided or mitigated. Water Board staff, acting as a responsible agency, is providing these comments to specify the scope and content of the environmental information germane to our statutory responsibilities pursuant to CEQA Guidelines, California Code of Regulations, title 14, section 15096. Based on our review of the IS/MND, we recommend the environmental document be recirculated for public review with a revised Project description that includes sufficient detail to address water quality for background native groundwater and impacts to wetland resources, so that responsible agencies reviewing the environmental document have adequate information to evaluate potential impacts to environmental resources that are germane to their authority.

AUTHORITY

All groundwater and surface waters are considered waters of the State. Surface waters include streams, lakes, ponds, and wetlands, and may be ephemeral, intermittent, or perennial. All waters of the State are protected under California law. State law assigns responsibility for protection of water quality in the Lahontan Region to the Lahontan Water Board. Some waters of the State are also waters of the U.S. The Federal Clean Water Act (CWA) provides additional protection for those waters of the State that are also waters of the U.S.

Peter C. Pumphrey, Chair | Patty Z. Kouyoumdjian, Executive Officer
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Recycled Paper

The *Water Quality Control Plan for the Lahontan Region* (Basin Plan) contains policies that the Water Board uses with other laws and regulations to protect the quality of waters of the State within the Lahontan Region. The Basin Plan sets forth water quality standards for surface water and groundwater of the Region, which include designated beneficial uses as well as narrative and numerical objectives that must be maintained or attained to protect those uses. The Basin Plan can be accessed via the Water Board's web site at http://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/references.shtml.

COMMENTS ON THE ENVIRONMENTAL REVIEW

A number of activities associated with the proposed Project appear to have the potential to impact waters of the State. In addition to mitigations and permitting requirements mentioned in the IS/MND, our specific comments on the Project and the environmental review are outlined below.

1. Section 2.10.2.1.1 states, "The high aluminum concentration measured in the indigenous water is likely not a representative concentration and is probably a result of the sampling methods. It is likely a sign of turbidity in the water sampled." The high aluminum in excess of the maximum contaminant level (MCL) is stated to not be representative of the native groundwater and attribute the result to an artifact of the sampling method, but the following sentence it is mentioned that it is likely indicative of turbidity in the water sampled. The water sampled should be representative of the native groundwater. Please provide clarification as to how the aluminum in excess of MCL is not representative of background groundwater concentrations.

2. We recognize the need to recharge groundwater supplies to meet demand, and State Water Project (SWP) water is a viable source to recharge local aquifers. However, SWP water is generally of lesser quality than native groundwater in the Antelope Valley. While Water Board staff appreciate AVEK providing the most recent background groundwater concentrations, in order to evaluate the Project's potential effect on the quality of native groundwater over time, we recommend that AVEK establish the background quality of the groundwater beneath the site prior to implementing recharge activities using a minimum of several quarters of data that would profile any changes due to seasonality and which would be needed to establish a statistically valid data set. The Groundwater Monitoring Plan, which will be prepared and implemented as part of the Project, should include provisions for establishing background water quality for groundwater.

3. As identified in the IS/MND, two fairly well-defined ephemeral streams traverses the Project site. These streams are a water of the State. The Project proponent will need to perform a jurisdictional delineation to determine the extent of these streams and other surface water resources on the Project site. A Jurisdictional Delineation Report documenting the results of the delineation will need to be submitted to Water Board staff for review and concurrence with respect to presence and extent of non-federal waters of the State on the Project site.

4. The IS/MND acknowledged two potential wetlands: a seasonal wetlands in an ephemeral stream as well as an existing retention basin of approximately 0.1 acre that contains cattails and willows. The environmental document states that the Project would not remove or alter the existing retention basin, but implies that the wetlands would be altered or removed. The IS/MND should clearly describe any proposed impacts to wetland resources.

5. Based on our review of the proposed Project, it appears that construction of the Project will result in excavation in, discharge of fill to, and physical alteration of surface waters on the site. Therefore, the Project proponent will be required to obtain either a CWA, section 401 water quality certification for impacts to federal waters or dredge and fill waste discharge requirements for impacts to non-federal waters, both are issued by the Lahontan Water Board. As part of that permitting process, the Project proponent will be required to avoid and minimize, to the extent possible, direct and indirect impacts to surface water resources. Early consultation with Water Board staff is highly encouraged.

6. Construction of the Project may require coverage under National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Water Quality Order 2009-0009-DWQ.

   a. A Project-specific Storm Water Pollution Prevention Plan (SWPPP) must be prepared and implemented in accordance with Water Quality Order 2009-0009-DWQ. The SWPPP shall specify the site-specific erosion and sediment control Best Management Practices (BMPs) that will be implemented to reduce potentially significant water quality impacts to a less than significant level.

   b. The SWPPP shall be applicable to all areas of the Project site including construction areas, access roads to and through the site, and staging and stockpile locations.

   c. Water Quality Order 2009-0009-DWQ requires that a project shall not result in an exceedance of any applicable water quality objective (WQO) for the receiving water. For this Project, the receiving waters are surface waters of the Antelope Hydrologic Unit 626.00 (Neenach Hydrologic Area 626.40). The primary water quality parameters potentially affected by the Project include chemical constituents (as defined by California Code of Regulations, title 22), oil and grease, pH, and turbidity. Numeric and narrative WQOs for these parameters in surface waters are outlined in Chapter 3 of the Basin Plan.

   d. Water Quality Order 2009-0009-DWQ specifies the applicable Numeric Action Levels (NALs) and Numeric Effluent Levels (NELs) for storm water and non-storm water discharges depending on the potential risk to the receiving water. Should storm water and/or non-storm water discharges enter a receiving water as a result of this Project, the discharge shall not

cause or contribute to the exceedance of any applicable WQO for that receiving water

e. Temporary BMPs must be implemented for all components of the Project until such time that permanent post-construction BMPs are in place and functioning.

7. The IS/MND did not discuss the need to initially purge the 18 proposed extraction wells, five (5) monitoring wells or to perform hydrostatic testing of the new pipeline. These activities have the potential to generate significant quantities of wastewater and may require separate permits (see Permitting Requirements below). We request that AVEK consider capturing these waste streams for reuse as dust control over the Project site or for discharge to the recharge basins. Should land disposal of these clear-water discharges be necessary outside the recharge basins, such discharge should be done in a manner that maximizes infiltration and does not concentrate flows or result in erosion. An appropriate combination of sediment and erosion control BMPs must be implemented for all clear-water discharges.

8. California's groundwater is an essential resource and groundwater basins in desert regions are currently susceptible to a state of overdraft. The volume of water discharged during construction activities is not provided in the IS/MND. Considering that a large volume of water waste may feasibly be generated during this project, please consider alternative solutions to manage the discharge in such a way that maximizes the beneficial use of the water and minimizes resource loss (i.e. through evaporation).

Please be advised of the permits that may be required for the proposed Project, as outlined above. The Project proponent is urged to consult with Water Board staff regarding these permitting actions. Information regarding these permits, including application forms, can be downloaded from our web site at http://www.waterboards.ca.gov/lahontan.

Thank you for the opportunity to comment on the IS/MND. If you have any questions regarding this letter, please contact me at (760) 241-7307 (shelby.barker@waterboards.ca.gov) or Jan Zimmerman, Senior Engineering Geologist, at (760) 241-7376 (jan.zimmerman@waterboards.ca.gov). Please send all correspondence regarding this Project to the Water Board's email address at Lahontan@waterboards.ca.gov and include the State Clearinghouse Number in the subject line.

Shelby Barker, PG, CHG
Engineering Geologist

cc: State Clearinghouse (SCH 2017061030) (state.clearinghouse@opr.ca.gov)
California Department of Fish and Wildlife (AskR5@wildlife.ca.gov)

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November 10, 2017

Shelby Barker, PG, CHG
Engineering Geologist
State of California – Water Boards
Lahontan Regional Water Quality Control Board
2501 Lake Tahoe Blvd.
So. Lake Tahoe, CA 96150

RE: CEQA Initial Study / Mitigated Negative Declaration, Antelope Valley – East Kern Water Agency, High Desert Water Bank, Los Angeles County, SCH No. 2017061030

The Antelope Valley – East Kern Water Agency (Agency) thanks you for your interest on the project and has acknowledged your comments pertaining to the High Desert Water Bank Project dated August 4, 2017. The Initial Study has been revised to expand and clarify the topics of concern to the Lahontan Regional Water Quality Control Board (RWQCB or Water Board)) of background native groundwater quality and wetland resources. These revisions include addition of and revisions to mitigation measures that do not change the anticipated level of impact as determined in the Original Draft Initial Study and Draft Mitigated Negative Declaration. The following summarizes how the Agency has addressed the comments provided by the RWQCB.

1. Groundwater Aluminum Concentration – The reporting of 200 mg/l aluminum concentration for the native groundwater quality in Table 2.10.2 of the Initial Study was in error. The concentration was reported as 200 um/l which correlates to 0.2 mg/l. Table 2.10.2 has been revised accordingly. The commentary regarding the aluminum concentration not being a representative sample of the native groundwater has been expanded to clarify that the analysis was based on a total aluminum and not dissolved aluminum sample and thus why we believe it is not a representative sample of aluminum concentration in the native groundwater. To further support the basis of the aluminum concentration, additional sampling will be conducted as part of the background native groundwater quality baseline comment by the RWQCB. See item 2 below.

2. Background Groundwater Quality Baseline – The Initial Study has been revised to change mitigation measure GEO-4 Groundwater Level Monitoring Plan to include a water quality component as well. The mitigation measure will be re titled as GEO-4 Groundwater Monitoring Plan and will include provisions for the development of a native groundwater quality baseline and continued monitoring of groundwater levels and quality.

3. Ephemeral Stream Jurisdictional Delineation – The Agency understands that waters of the State are protected by the Water Board and other State agencies, and that impacts to waters of the State require issuance of permits from the relevant agencies. Surveys in March and April 2017 identified two potentially jurisdictional ephemeral drainages and two potential wetland features. In order to fully assess the extent of waters of the State within the Project site and pursuant to the new mitigation measure BIO-10, below, a formal jurisdictional delineation field survey was conducted in September 2017. A Jurisdictional Delineation

Report documenting the results of the formal delineation is in progress, and will be submitted to the Water Board for review and concurrence upon completion.

Accordingly, Mitigation Measure BIO-10 has been added to the Initial Study and proposed Mitigation Negative Declaration, as follows:

BIO-10. Jurisdictional Drainages and Wetlands. Prior to construction of the recharge basins or any ground-disturbing activities within waterways and wetlands on the site, a formal Jurisdictional Delineation will be conducted of all potential jurisdictional waters within the Project site. Fill or disturbance of any jurisdictional waters or wetlands will be permitted through the appropriate agency (i.e., Sections 401 and 404 of Clean Waters Act, or Section 1600 of California Fish and Game Code). Impacts to jurisdictional waters and wetlands will be avoided to the extent feasible, and shall not occur prior to issuance of any required local, State, and Federal permits.

4. Wetlands - In response to concerns from the Water Board and other State agencies about impacts to wetlands and other waters resources and sensitive biological resources on the Project site, the Project has been revised to include approximately 322 acres of habitat management lands. These areas will be maintained in an undisturbed state and managed in perpetuity for the purpose of protecting sensitive natural resources. Habitat management lands will encompass both ephemeral drainages and the natural seasonal wetland to the extent feasible; thus, the Project as designed will result in no impacts to natural waters of the State. As described in the initial study, the manmade retention basin which supports hydrophytic vegetation is associated with existing infrastructure and will not be removed or altered by the Project.

5. Physical Alteration of Surface Waters - The Agency understands that discharge of fill to or other alterations of surface waters, including excavations in and changes to the physical structure of features, would require issuance of either a water quality certification or fill waste discharge requirements issued by the Water Board. However, as discussed, direct impacts to surface waters will be avoided through implementation of habitat management lands encompassing surface waters features on the Project site. Implementation of best management practices including sediment and erosion control as described in the initial study will prevent indirect impacts to waters features on the Project site. Thus, no permits are being sought at this time for impacts to surface waters.

6. National Pollutant Discharge Elimination System Construction General Permit – The Agency understands that the project is subject to the NPDES Construction Activities General permit and as such has provided for Mitigation Measure GEO-1 SWPPP in the initial study / Mitigated Negative Declaration. This mitigation measure provides requirements for the Agency to comply with the referenced permitting including the preparation and implementation of a project specific Storm Water Pollution Prevention Plan (SWPPP) that will address all of the issues of concern presented in the Water Board's letter.

7. Well Purging and Pipeline Hydrostatic Testing Discharges – The Agency does not anticipate that well development and pipeline testing activities will generate any offsite water discharges. Water discharges associated with the well development and pipeline testing

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process will be retained on site and will be allowed to infiltrate back into the groundwater table. The Agency does not anticipate impacts to surface waters as a result of the well development and pipeline testing process. The Agency will implement appropriate sediment and erosion control BMPs for all well purging and pipeline testing activities.

8. Construction Water Reuse - The Agency Understands that the local groundwater basin is in an overdraft condition and that there will be large volumes of construction water needed for the construction of the proposed Project. The Agency also understands that though the proposed Project may have a temporary loss of water, the Project once implemented will benefit the local groundwater basin as it will be recharging water. The majority of construction water will be needed for well development, pipeline testing, and dust control. The Agency does not anticipate that all of this water used for construction will be lost. Water used for well development and pipeline testing activities will be retained onsite and will be allowed to infiltrate back into the groundwater table and thus the loss of this resource will be minimal. Construction water for dust control will be collected from either surface water from the California Aqueduct and or collected from pipeline testing and or well development activities thus minimizing the loss of groundwater as a result of dust control activities.

The Agency believes that the information and responses provided in this letter adequately respond to the issues raised by the Water Board. Accordingly, the Agency believes that the Mitigated Negative Declaration, so modified, can be adopted by the Agency in accordance with Section 15074 of the CEQA Guidelines. Further, the Agency believes that addressing these comments will not require recirculation of the Draft Mitigated Negative Declaration, as no substantial revisions to the Draft Mitigated Negative Declaration are required (reference Section 15073.5(c) of the CEQA Guidelines). As such, the Agency will be moving forward with the adoption of a Mitigated Negative Declaration for this project.

Should there be the need for additional information, please do not hesitate to give me a call or send me an email at eric.garibay@aecom.com

Yours Sincerely,

Eric Garibay, PE
Senior Engineer

Project Number	60537613
Attachments:	None
Copy:	Dwayne Chisam / AVEK Matt Knudson / AVEK Ben Horn / AECOM Wayne Vogler / AECOM Shay Lawrey / Jericho Systems Inc. Julie Gilbert / Jericho Systems Inc.

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY EDMUND G. BROWN JR., Governor

DEPARTMENT OF WATER RESOURCES
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JUL 13 2017

Dwayne Chisam
General Manager
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Palmdale, California 93551-2855

California Environmental Quality Act CEQA Initial Study, High Desert Water Bank, California Aqueduct's East Branch, Approximate Mileposts 307.23 and 309.54, Southern Field Division, Los Angeles County, State Clearinghouse Number 2017061030

Dear Mr. Chisam,

This is an addendum to the California Department of Water Resources (DWR) comment letter that was submitted to your office on July 7, 2017 (see attachment). The site of the proposed High Desert Water Bank project (Project) is adjacent to the East Branch of the California Aqueduct (Aqueduct). The Initial Study states that a program will be developed to monitor changes in groundwater levels in the area affected by the groundwater recharge. It is in DWR's interest to have ground water levels monitored adjacent to the Aqueduct since they can have potential impact to the integrity of the structure, either thru liquefaction (higher groundwater levels) or subsidence (lower groundwater levels). DWR requests the opportunity to review and comment on the groundwater monitoring program once it is developed to ensure groundwater levels adjacent to the Aqueduct are adequately monitored.

Please provide DWR with a copy of any subsequent environmental documentation related to the Project's groundwater monitoring program when it becomes available for public review. Documents shall be sent to:

Lincoln King, Chief
Turnouts and Special Projects
State Water Project Analysis Office
California Department of Water Resources
1416 Ninth Street, Room 1655
Sacramento, California 95814

If you have any questions, please contact me at (916) 653-4313, or either Lincoln King at (916) 653-4389 or Dietlind Wiesner at (916) 653-8127 of my staff.

Sincerely,

Pedro Villalobos, Chief
State Water Project Analysis Office

Attachment

cc: (See attached list.)

cc: Mr. Keith Dyas
President, Board of Directors
Antelope Valley-East Kern Water Agency
6500 West Avenue N
Palmdale, California 93551-2855

State Clearinghouse
Office of Planning and Research
1400 Tenth Street, Room 121
Sacramento, California 95814

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY EDMUND G. BROWN JR., Governor

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JUL 07 2017

Mr. Dwayne Chisam, General Manager
Antelope Valley-East Kern Water Agency
6500 West Avenue N
Palmdale, California 93551-2855

California Environmental Quality Act (CEQA) Initial Study, High Desert Water Bank, California Aqueduct's East Branch, Approximate Mileposts 307.23 and 309.54, Southern Field Division, Los Angeles County, State Clearinghouse Number 2017061030

Dear Mr. Chisam,

The Department of Water Resources (DWR) would like to thank you for the opportunity to review the Initial Study (IS) for the High Desert Water Bank. The Antelope Valley – East Kern Water Agency (AVEKWA) proposes to build and operate a groundwater recharge and recovery program referenced as the High Desert Water Bank (the Project) on an approximately 1,500-acre site in Los Angeles County bounded by:

- Avenue A (Kern / Los Angeles County Line) on the north,
- 300th Street West on the west,
- 280th Street West on the east, and
- The California Aqueduct's East Branch on the south.

The California Aqueduct's East Branch (Aqueduct) will be the source of water for recharge operations and the point of delivery for return flow operations for the Project. The Project area is also situated south of an existing groundwater bank owned and operated by another agency. AVEKWA proposes the implementation of a 280,000 acre-foot capacity groundwater bank that will store State Water Project (SWP) water from various SWP contractors, including AVEKWA, and other partnering agencies throughout the State of California. The Project proposes to store approximately 70,000 acre-feet per year of SWP surface water conveyed to the site via the Aqueduct. Recharge operations are planned during wet weather years when SWP allocations exceed demands. AVEKWA then proposes to recover 90 percent of the stored water with up to an estimated 70,000 acre-feet per year returned during dry and critical weather years when SWP allocations are low or disrupted. The Project would allow AVEKWA, participating SWP contractors, and AVEKWA's partners to rely on the groundwater bank as their primary source of water during dry weather years.

The proposed Project consists of storing surface water during wet weather periods and recovering the stored water during dry weather year periods. It will not require

Aqueduct or pumping facility capacity expansion, either for recharge or recovery operations. Recharge and recovery operations will stay within the capacity of the Aqueduct and AVEKWA and its partners' capacity allocations. The proposed Project would utilize electric water pumps that are anticipated to be served off the existing power grid system running along the proposed Project's southern boundary. Addition of new electric lines may require expansion of the existing power grid in order to meet the proposed Project's power demands.

The Project would include rehabilitation of AVEKWA's existing 280th Street West Turnout at Milepost 309.54 to 50 cubic feet per second (cfs) and construction of a new 150 cfs gravity-flow turnout at approximately Milepost 307.23 in Pool 43. Both delivery structures will have recovery/recharge ability making them turn-in/turnouts, hereinafter referred to as turnouts. Construction of the new turnout would include installation of a turnout bay utilizing a cofferdam within the Aqueduct; underground piping; a metering building; and all associated electrical, mechanical and instrumentation equipment. An approximately 2.3-mile length of 36- to 70-inch diameter buried bi-directional recovery/recharge pipeline is proposed to run parallel to the Aqueduct, connecting the two turnouts.

Comments on the IS from DWR's State Water Project Analysis Office (SWPAO):

1. In order to satisfy the environmental requirements for a turnout agreement, sufficient detail must be provided in the Project description for both of the turnouts to be constructed or modified. Otherwise a supplemental environmental document for the turnout portions of this Project will be required. The level of detail includes: footprints of both turnout construction sites which include, but are not limited to; area; location; equipment usage; staging areas; present habitat or species; and an approved mitigation, monitoring and reporting plan.

2. The IS states that the groundwater recharge project may be used to facilitate storage of AVEKWA's partners' and other SWP contractors' SWP water supplies. DWR strongly supports such water management activities that allow the SWP contractors to cooperate in managing their water supplies, increase dry year water reliability, and provide flexibility in delivery and recovery operations. However, if such cooperative exchanges, transfers, or storage and return of water are proposed, they each require additional CEQA documentation analyzing potential place of use, operations, growth inducement, and hydrology impacts. Each cooperative water transaction among DWR, AVEKWA, its partners, or other participating SWP contractors requires that an executed agreement be prepared by DWR's SWPAO that tier from the long-term SWP Water Supply Contracts.

Comments on the IS from DWR's Division of Operations and Maintenance, Operations Control Center and Southern Field Division Operations:

1. Pool 43 currently contains two active turnouts: AVEKWA's 305th Street West Turnout at Milepost 306.71 (27 cfs) and 294th Street West Turnout at Milepost 308.05 (18 cfs), for a total of 45 cfs. In this proposal, AVEKWA would increase the demand in Pool 43 an additional 200 cfs by modifying the currently inactive 280th Street West Turnout at MP 309.54 from 40 to 50 cfs, and adding a new turnout near 300th Street West with 150 cfs capacity, (at approximate Milepost 307.23) for a total of 245 cfs. The proposed 444% demand increase in Pool 43 raises concerns regarding exceeding the Aqueduct drawdown criterion of 2 feet per day in a relatively small pool. Therefore, DWR can accommodate AVEKWA's newest request under the following conditions:
   a) DWR shall have SCADA monitoring and shutdown control over the enlarged 280th Street West Turnout and the new turnout to be installed near 300th Street West;
   b) Any increase of the demand at the enlarged or new turnout over 40 cfs requires that Alamo Powerplant or the Cottonwood Chute bypass be in operation in order to balance the water demand being diverted from the Aqueduct without exceeding the 2 foot per day drawdown criteria.
   c) AVEKWA's requested water schedules may not be approved when Alamo Powerplant and the Cottonwood Chute bypass are out of service.
   d) AVEKWA must submit daily water demand forecasts to DWR for the modified 280th Street West Turnout and the new turnout near 300th Street West.

Comments on the IS from DWR's Division of Operations and Maintenance, Encroachment Permit Section:

1. AVEKWA has proposed an approximate 2.3-mile length of 36- to 70-inch diameter buried bi-directional recovery/recharge pipeline route to run parallel to DWR's Aqueduct connecting the new turnout at approximately Milepost 307.23 to the 280th Street West Turnout at Milepost 309.54. Additional buried bi-directional pipeline and above-ground pipeline is proposed to carry the water from the wells and to the recovery basins.

   Portions of the proposed pipeline routes to and from the groundwater recharge basins will be in DWR's right-of-way and may require an Encroachment Permit from DWR prior to the start of construction. Information on obtaining an encroachment permit from DWR can be viewed at:
   http://www.water.ca.gov/regulations/docs/Encroachment_Permit_Regulations_text.pdf

2. Encroachment Permit Regulations Section 612.3. Longitudinal Encroachments
   a) For longitudinal encroachments within DWR's right-of-way where open aqueduct exists:

      1) Longitudinal encroachments that do not directly serve DWR or water agencies receiving water from the SWP shall not be permitted. Exceptions to this departmental policy may be considered at DWR's discretion on an individual basis.

2) For those instances where longitudinal encroachments are permitted, the longitudinal encroachment shall not be more than ten (10) feet from the right-of-way boundary line, and on the downslope side of the open canal where feasible.

Comments on the IS from DWR's Division of Engineering Geodetic Branch:

1. The attached Lands Exhibit outlines the DWR fee ownership line for determining where an encroachment permit may be required.

Please provide DWR with a copy of any subsequent environmental documentation with regards to this project when it becomes available for public review. The document shall be sent to:

Lincoln King, Chief
Turnouts and Special Projects
State Water Project Analysis Office
California Department of Water Resources
1416 9th Street, Room 1655
Sacramento, California 95814

If you have any questions or need additional information, please contact me at (916) 653-4313, or either Lincoln King at (916) 653-4389 or Dietlind Wiesner at (916) 653-8127 of my staff.

Sincerely,

Pedro Villalobos, Chief
State Water Project Analysis Office

Attachment: Exhibit

cc: Mr. Keith Dyas
President, Board of Directors
Antelope Valley-East Kern Water Agency
6500 West Avenue N
Palmdale, California 93551-2855

State Clearinghouse
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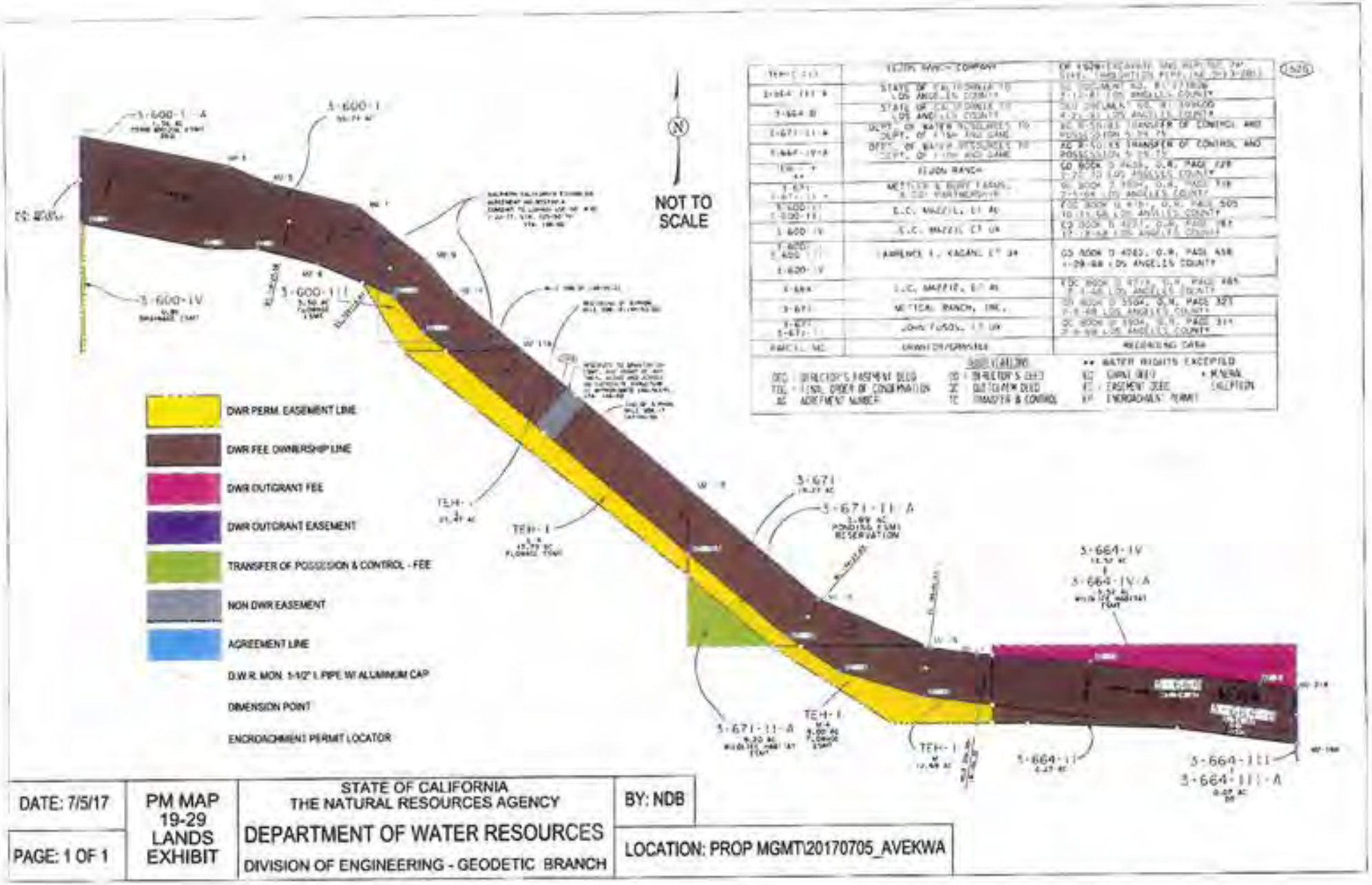

DATE: 7/5/17	PM MAP 19-29 LANDS EXHIBIT	STATE OF CALIFORNIA THE NATURAL RESOURCES AGENCY DEPARTMENT OF WATER RESOURCES DIVISION OF ENGINEERING - GEODETIC BRANCH	BY: NDB
PAGE: 1 OF 1			LOCATION: PROP MGMT\20170705_AVEKWA

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November 10, 2017

Pedro Villalobos, Chief
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Sacramento, CA 94236 – 0001

RE: CEQA Initial Study / Mitigated Negative Declaration, Antelope Valley – East Kern Water Agency, High Desert Water Bank, California Aqueduct East Branch, Near Mileposts 307.23 and 309.54, South Field Division, Los Angeles County, SCH No. 2017061030

The Antelope Valley – East Kern Water Agency (Agency) thanks you for your interest on the project and has acknowledged your comments pertaining to the High Desert Water Bank Project dated July 7, 2017 and July 13, 2017. The following summarizes how the Agency has addressed the comments provided by the Department of Water Resources (DWR).

1. Facilities Descriptions (July 7, 2017 letter, State Water Project Analysis Office (SWPAO) comment no. 1) - Sections 1.4.1, 1.4.2, and 1.5.2 which describe the Project facilities and construction has been revised to add references to Figures 14 and 15 which have been added to show a foot print of the proposed turnout improvements. Discussions about present habitat and species on the project area are discussed in Section 2.5 and Appendix D of the Initial Study. A Mitigation, Monitoring, and Reporting Plan will be adopted with the Project's CEQA Mitigated Negative Declaration. A copy of this plan will be provided to DWR during the turnout agreement stage.

2. Water Transfers and Exchanges (July 7, 2017 letter, SWPAO comment no. 2) - The Agency acknowledges that any water transfer and exchanges completed as part of this project will require additional environmental review. The Agency acknowledges that these evaluations will be performed under a separate CEQA process for each transfer or exchange of water between State Water Contractors and other partnering agencies. The Agency also acknowledges that it will work with DWR on water transfer and exchange agreements that tier from the long term State Water Project water supply contracts

3. Turnout Operation Limitations (July 7, 2017 letter, Division of Operations and Maintenance , Operations Control Center, Southern Field Division) - The Agency understands DWR's concerns over operations of the Aqueduct under the proposed added demand. Section 1.3.1 of the Initial Study has been revised to include DWR's operation limitations of the proposed turnouts and identifies the SCADA provisions that would allow DWR to connect to the facilities to monitor and control shutdown of the new and existing modified turnout.

4. Encroachment Permit Requirements (July 7, 2017 letter, Division of Operations and Maintenance , Encroachment Permit Section comment no. 1) - The only facilities planned for

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construction within DWR's Right of Way include the construction of the new turnout near 300th St. West and rehabilitation of the existing turnout near 280th St. West. Construction operations related to these facilities will be handled through the turnout agreement, and turnout agreement modifications process. Though not anticipated, the Agency will file an encroachment permit with DWR if so required.

5. Longitudinal Encroachments (July 7, 2017 letter, Division of Operations and Maintenance, Encroachment Permit Section comment no. 2) - At this preliminary stage of the project, the Agency does not anticipate the need for any longitudinal encroachments. For the most part (excluding some turnout piping), pipelines paralleling the Aqueduct will be constructed outside of DWR's Right of Way.

6. Encroachment Permit Requirements (July 7, 2017 letter, Division of Engineering Geodetic Branch) - The Agency acknowledges receipt of the lands exhibit which outlines DWR's Fee Ownership land. The Agency will use this exhibit in the event that an encroachment permit is required.

7. Groundwater Level Monitoring Program (July 13, 2017 letter) – The Agency will be providing DWR with a copy of the Ground Water Level Monitoring Plan as identified in Mitigation Measure GEO-4 to DWR for review and comment as requested.

The revisions to the Initial Study mentioned above do not change the level of impact as identified in the original draft Initial Study. The Agency hopes that DWR's comments have been addressed and will be moving forward with the CEQA process in adopting a Mitigated Negative Declaration for this Project.

Should there be the need for additional information, please do not hesitate to give me a call or send me an email at ben.horn@aecom.com

Yours Sincerely,

Ben P. Horn, PE
Managing Engineer

Project Number	60537613
Attachments:	None
Copy:	Dwayne Chisam / AVEK Matt Knudson / AVEK Eric Garibay / AECOM Wayne Vogler / AECOM Shay Lawrey / Jericho Systems Inc. Julie Gilbert / Jericho Systems Inc.

STATE OF CALIFORNIA Edmund G. Brown Jr., Governor
NATIVE AMERICAN HERITAGE COMMISSION
Environmental and Cultural Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
Phone (916) 373-3710
Fax (916) 373-5471

June 23, 2017

Dwayne Chisam, General Manager
Antelope Valley – East Kern Water Agency
6500 West Avenue N
Palmdale, CA 93551

Re: SCH# 2017081030, High Desert Water Bank Project, Community of Neenach, Los Angeles County, California

Dear Mr. Chisam:

The Native American Heritage Commission (NAHC) has reviewed the Mitigated Negative Declaration prepared for the project referenced above. The review included the Project Description, the Evaluation of Potential Environmental Impacts, section 2.6 Cultural Resources, and Appendix E, Archaeological Phase I Report prepared by AECOM for the Antelope Valley – East Kern Water Agency. We have the following concerns:

1. There is no Tribal Cultural Resources section or subsection in the Evaluation of Potential Environmental Impacts as per California Natural Resources Agency (2016) "Final Text for tribal cultural resources update to Appendix G: Environmental Checklist Form," http://resources.ca.gov/ceqa/docs/ab52/Clean-final-AB-52-App-G-lead-Submitted.pdf

2. There is no documentation of **government-to-government consultation by the lead agency** under AB-52 with Native American tribes traditionally and culturally affiliated to the project area as required by statute, or that mitigation measures were developed in consultation with the tribes. Discussions under AB-52 may include the type of document prepared; avoidance, minimization of damage to resources; and proposed mitigation. Contact by consultants during the Cultural Resources Assessments is not formal consultation.

3. There are no mitigation measures specifically addressing Tribal Cultural Resources separately. Mitigation measures must take Tribal Cultural Resources into consideration as required under AB-52, **with or without consultation** occurring. Mitigation language for archaeological resources is not always appropriate for or similar to measures specifically for handling Tribal Cultural Resources.

The California Environmental Quality Act (CEQA)[1], specifically Public Resources Code section 21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment.[2] If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an environmental impact report (EIR) shall be prepared.[3] In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources with the area of project effect (APE).

CEQA was amended in 2014 by Assembly Bill 52. (AB 52).[4] **AB 52 applies to any project for which a notice of preparation or a notice of negative declaration or mitigated negative declaration is filed on or after July 1, 2015.** AB 52 created a separate category for "tribal cultural resources"[5], that now includes "a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment.[6] Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.[7] Your project may also be subject to **Senate Bill 18 (SB 18)** (Burton, Chapter 905, Statutes of 2004), Government Code 65352.3, if it also involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space. **Both SB 18 and AB 52 have tribal consultation requirements.** Additionally, if your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966[8] may also apply.

[1] Pub. Resources Code § 21000 et seq.
[2] Pub. Resources Code § 21084.1; Cal. Code Regs., tit. 14, § 15064.5 (b); CEQA Guidelines Section 15064.5 (b)
[3] Pub. Resources Code § 21080 (d); Cal. Code Regs., tit. 14, § 15064 subd.(a)(1); CEQA Guidelines § 15064 (a)(1)
[4] Government Code 65352.3
[5] Pub. Resources Code § 21074
[6] Pub. Resources Code § 21084.2
[7] Pub. Resources Code § 21084.3 (a)
[8] 154 U.S.C. 300101, 36 C.F.R. § 800 et seq.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

Agencies should be aware that AB 52 does not preclude agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52. For that reason, we urge you to continue to request Native American Tribal Consultation Lists and Sacred Lands File searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/. Additional information regarding AB 52 can be found online at http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf, entitled "Tribal Consultation Under AB 52: Requirements and Best Practices".

The NAHC recommends lead agencies consult with all California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources.

A brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments is also attached.

Please contact me at gayle.totton@nahc.ca.gov or call (916) 373-3710 if you have any questions.

Sincerely,

Gayle Totton

Gayle Totton, B.S., M.A., Ph.D
Associate Governmental Project Analyst

Attachment

cc: State Clearinghouse

Pertinent Statutory Information:

Under AB 52:
AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:
Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a **lead agency** shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice.
A **lead agency** shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project.[9] and **prior to the release of a negative declaration, mitigated negative declaration or environmental impact report**. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code § 65352.4 (SB 18).[10]
The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:

a. Alternatives to the project.
b. Recommended mitigation measures.
c. Significant effects.[11]

1. The following topics are discretionary topics of consultation:
   a. Type of environmental review necessary.
   b. Significance of the tribal cultural resources.
   c. Significance of the project's impacts on tribal cultural resources.

If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. [12]
With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process **shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code sections 6254 (r) and 6254.10.** Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public.[13]
If a project may have a significant impact on a tribal cultural resource, **the lead agency's environmental document shall discuss** both of the following:

a. Whether the proposed project has a significant impact on an identified tribal cultural resource.
b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code section 21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource.[14]

Consultation with a tribe shall be considered concluded when either of the following occurs:

a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or
b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached.[15]

Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code section 21080.3.2 **shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program**, if determined to avoid or lessen the impact pursuant to Public Resources Code section 21082.3, subdivision (b), paragraph 2, and shall be fully enforceable.[16]
If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, **the lead agency shall consider feasible mitigation** pursuant to Public Resources Code section 21084.3 (b).[17]
An environmental impact report **may not be certified**, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:

a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code sections 21080.3.1 and 21080.3.2 and concluded pursuant to Public Resources Code section 21080.3.2.
b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.

---

[9] Pub. Resources Code § 21080.3.1, subds. (d) and (e)
[10] Pub. Resources Code § 21080.3.1 (b)
[11] Pub. Resources Code § 21080.3.2 (a)
[12] Pub. Resources Code § 21080.3.2 (a)
[13] Pub. Resources Code § 21082.3 (c)(1)
[14] Pub. Resources Code § 21082.3 (b)
[15] Pub. Resources Code § 21080.3.2 (b)
[16] Pub. Resources Code § 21082.3 (a)
[17] Pub. Resources Code § 21082.3 (e)

Examples of Mitigation Measures That May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:

- Avoidance and preservation of the resources in place, including, but not limited to:
  - Planning and construction to avoid the resources and protect the cultural and natural context.
  - Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
- Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
  - Protecting the cultural character and integrity of the resource.
  - Protecting the traditional use of the resource.
  - Protecting the confidentiality of the resource.
- Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
- Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed.[23]
- Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated.[24]

The lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.

- Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources.[25] In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
- Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
- Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code section 7050.5, Public Resources Code section 5097.98, and Cal. Code Regs., tit. 14, section 15064.5, subdivisions (d) and (e) (CEQA Guidelines section 15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

[23] (Civ. Code § 815.3 (c)).
[24] (Pub. Resources Code § 5097.991).
[25] per Cal. Code Regs., tit. 14, section 15064.5(f) (CEQA Guidelines section 15064.5(f)).

AECOM

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661.283.2323 tel
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July 25, 2017

Gayle Totton, BS MA PhD
Associate Governmental Project Analyst
Native American Heritage Commission
Environmental and Cultural Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691

RE: High Desert Water Bank Project, Community of Neenach; Los Angeles County, California SCH No. 2017061030

The Antelope Valley – East Kern Water Agency (Agency) thanks you for your interest on the project and has acknowledged your comments pertaining to the High Desert Water Bank Project. Please note that the Native American Hermitage Commission Consultation section of the Archaeological Phase I Report was intentionally omitted from Appendix E of the Initial Study due to confidentiality guidelines. This section of the Archaeological Phase I Report is now included in this letter for your reference. Chapter 4 of Appendix E of the Initial Study (Phase I Archeological Report) summarizes the findings of this consultation which resulted in the mitigation measures presented in Section 2.6.4 of the Initial Study which include protection of Native American Cultural Resources. This supplement supports the Agency's efforts in determining and minimizing environmental impacts to Native American Cultural Resources.

Should there be the need for additional information, please do not hesitate to give me a call or send me an email at eric.garibay@aecom.com

Yours Sincerely,

Eric Garibay, PE
Senior Engineer

Project Number	60537613.0004
Attachments:	Archaeological Phase I Report Appendix B – Native American Contact Program
Copy:	Dwayne Chisam / AVEK Matt Knudson / AVEK Ben Horn / AECOM Alec Stevenson / AECOM Shay Lawray / Jericho Systems Inc.

Garibay, Eric

From: Totton, Gayle@NAHC <Gayle.Totton@NAHC.CA.GOV>
Sent: Tuesday, July 25, 2017 1:44 PM
To: Garibay, Eric
Cc: dchisam@avek.org; mknudson@avek.org; Horn, Ben; Stevenson, Alec; Shay Lawrey (shay@jericho-systems.com)
Subject: RE: AVEK High Desert Water Bank CEQA SCH NO. 2017061030
Attachments: image001.png

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Red Category

Good afternoon Mr. Garibay,

Thank you for the attached letter and a clarification of the contact program that was done by AECOM.

While the response letter documents AECOM's outreach to tribes, it does not document the lead agency's participation in the consultation process. My comment #2 in the MND Review document was that there is no documentation of the lead agency (Antelope Valley - East Kern Water Agency (AV-EKWA)) conducting (or attempting to conduct) government-to-government consultation. The contacts by AECOM do not meet the requirements for consultation under AB-52 (as defined in SB-18) because AECOM is not a governmental agency, nor do they have decision making power for AV-EKWA, and they are not bound by the same legal requirements for confidentiality. Only the lead agency can make decisions (ideally in consultation with interested tribes) on the type of environmental document that is appropriate, and mitigation for the potentially impacted resources.

The response letter also does not address the technical formatting issue of not including a Tribal Cultural Resources (TCR) section, separate and distinct from archaeology, nor does it have any mitigation for inadvertent finds of TCRs, also distinct from Archaeology. This mitigation is required with or without consultation taking place. The response does not address the concerns we documented in the MND review.

Please contact me if you have additional questions.

Sincerely,

Gayle Totton, M.A., Ph.D.
Associate Governmental Program Analyst
Native American Heritage Commission
(916) 373-3710

From: Garibay, Eric [Eric.Garibay@aecom.com]
Sent: Tuesday, July 25, 2017 11:36 AM
To: Totton, Gayle@NAHC
Cc: dchisam@avek.org; mknudson@avek.org; Horn, Ben; Stevenson, Alec; Shay Lawrey (shay@jericho-systems.com)
Subject: AVEK High Desert Water Bank CEQA SCH NO. 2017061030

Good morning Gayle, AECOM is assisting the Antelope Valley - East Kern Water Agency (Agency) with the CEQA process for the subject project. The Agency thanks you for your interest and is providing the attached letter in response to the Native American Heritage Commission's comments on the project. The Agency is continuing to move forward on a path for approval of this project.

Please review and let me know if there are any questions or the need for additional information.

Thank you.

Eric Garibay, PE
Senior Engineer, Water
D +1-661-283-2352
eric.garibay@aecom.com<mailto:eric.garibay@aecom.com>

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November 10, 2017

Gayle Totton, BS MA PhD
Associate Governmental Project Analyst
Native American Heritage Commission
Environmental and Cultural Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691

RE: Antelope Valley – East Kern Water Agency : High Desert Water Bank Project, Community of Neenach; Los Angeles County, California SCH No. 2017061030

The Antelope Valley – East Kern Water Agency (Agency) thanks you for your interest on the project and has acknowledged your comments pertaining to the High Desert Water Bank Project including your email to AECOM dated July 25, 2017. The following summarizes how the Agency has addressed the comments provided by the Native American Heritage Commission (NAHC).

1. Tribal Cultural Resources Section – The Initial Study has been revised to include Section 2.18 which addresses Tribal Cultural Resources. Appendix E of the Initial Study which includes the Archeological Phase I Report has also been revised to include Chapter 8 which addresses Tribal Cultural Resources. Appendix B of the Initial Study which includes the CEQA checklist has also been revised to include Section XVII - Tribal Cultural Resources.

2. AB 52 Government to Government Consultations – The Antelope Valley – East Kern Water Agency as Lead Agency has received two letters from tribal groups which include the San Manuel Band of Mission Indians and the San Gabriel Band of Mission Indians. One requesting consultation and the second requesting notification of projects within their territory. The Agency has undertaken consultations with both tribal groups. The San Gabriel Band of Mission Indians has not responded within the 30 day period stipulated by CEQA. The San Manuel Band of Mission Indians has notified the Agency that no further consultation is needed and has recommended some mitigation measures to be included in the final document.

3. Tribal Cultural Resources Mitigation Measures – Section 2.18 of the Initial Study includes mitigation measures specifically for Tribal Cultural Resource to cover inadvertent cultural resources finds. These mitigation measures were developed as part of the AB 52 Consultation process with the San Manuel Band of Mission Indians.

The revisions to the Initial Study mentioned above and the AB 52 consultation process did not change the level of impact as identified in the original draft Initial Study. The Agency has addressed the NAHC's comments and will be moving forward with the CEQA process in adopting a Mitigated Negative Declaration for this Project.

AECOM

Should there be the need for additional information, please do not hesitate to give me a call or send me an email at eric.garibay@aecom.com

Yours Sincerely,

Eric Garibay, PE
Senior Engineer

Project Number	60537613.0004
Attachments:	Initial Study - Section 2.18, Appendices B and E
Copy:	Dwayne Chisam / AVEK Matt Knudson / AVEK Ben Horn / AECOM Wayne Vogler / AECOM Alec Stevenson / AECOM Shay Lawrey / Jericho Systems Inc. Julie Gilbert / Jericho Systems Inc.

San Manuel Band of Mission Indians

July 14, 2017

Avek Water Agency
JUL 20 2017
Received

Antelope Valley-East Kern Water Agency
6500 West Avenue N
Palmdale, CA 93551

RE: AB 52 (PRC Subsections 21073, 21074, 21080.3.1, 21080.3.2., 21082.3, 21083.09, 21084.2, 21084.3, and 5097.94.) Consultation

To whom it may concern:

The San Manuel Band of Mission Indians respectfully requests that consultations on a government-to-government basis be incorporated into your Agency's processes and procedures for all projects within your jurisdiction that have the potential to impact tribal cultural resources, as required by AB 52 that was signed into law in 2014. AB 52 amended CEQA with requirements that Tribal Cultural Resources be considered along with historic, archaeological, and paleontological resources when discretionary projects are planned. This letter serves as a formal request for general consultation, pursuant to CEQA (as amended, 2014), with the Antelope Valley-East Kern Water Agency.

San Manuel Band of Mission Indians

The San Manuel Band of Mission Indians ("Tribe") is a federally recognized American Indian tribe located near the city of Highland, San Bernardino County, California. Since 1891, Tribe has been recognized as a sovereign nation with the right of self-government by the United States. Since time immemorial, the San Manuel tribal community has endured change and hardship. Amidst these challenges, Tribe continued to maintain its unique form of governance. Like other governments, it seeks to provide services for its citizens by building infrastructure, maintaining civil services, and promoting social, economic, and cultural development. Today, San Manuel's Tribal government oversees many governmental units, including, but not limited to, the departments of fire, public safety, education, cultural resources, and environment.

Tribal Traditional Territory and CEQA Consultation

The Tribe has close ancestral ties to the *Yuhaaviatam* Clan, or "People of the Pines", which is one of several clans of the greater Serrano Indian Nation whose aboriginal territory encompasses much of present-day San Bernardino County, southeast Kern County, eastern Los Angeles County, and northwestern Riverside County. The Tribe has maintained a close connection with its ancestral territory and the resources it contains and has been designated as the Most Likely Descendants (MLD) by the California Native American Heritage Commission (NAHC) on numerous occasions upon the inadvertent discovery of human remains and cultural resources within the borders of its ancestral territory.

26569 Community Center Drive • Highland, CA 92346 • Office: (909) 864-8933 • FAX: (909) 864-3

The enclosed map depicts the boundaries of Tribe's traditional territory and is provided for your use as a planning tool. Your agency oversees projects within Tribe's ancestral territory and, as a result, we hereby request to review all of your CEQA-based discretionary projects within that territory so that we may have an opportunity to comment on the identification and protection of both potential and known Tribal Cultural Resources and historical resources. These resources and this opportunity are of great importance to the Tribe.

Consultation Protocols, Procedures, and Requests

As you are aware, with regards to AB 52, there are specific timelines and sequential steps that govern the agency/tribe consultation process. We have enclosed a Timeline and Consultation Process Flow Chart for your reference that details such procedures and protocols.

It should also be noted here that there are other legal compliance requirements for tribal consultation, such as the requirements contained in SB 18 for any proposed general plan amendments, specific plans and their amendments, and certain other applications that would designate large areas of open space. Under SB 18, as stipulated in GC 65352.3, Tribe will have 90 days from the date of receipt of each proposed general plan or amendment of a general plan in which to initiate consultation. As the consultation timelines differ for AB52 and SB 18, we would ask that the agency ensure that correspondence on these subjects not be combined in ways that convolute these different processes or unduly foreshorten SB18 review timelines.

Additionally, please note that in providing information to Tribe about specific projects under any of the above-referenced statutory and/or regulatory requirements, we are requesting the following information be included, at minimum:

1. Project name, number (if applicable), and description, including any engineering/design plans for the proposed project, especially those indicating where ground-disturbing activities will occur and to what horizontal and vertical extent.

2. The results of a records search of the Sacred Lands Files managed by the CA Native American Heritage Commission (NAHC) and a site file and associated literature search at the appropriate California Historical Resources Information System Information Center (CHRIS) to identify any and all recorded cultural resources within a 1-mile radius of the proposed project location(s), as well as general background research using GLO maps, Sanborn maps, historical atlases, city and state records, and other historical documents.

3. Project location information, including the following maps/illustrations:
   a. an aerial map;
   b. a USGS quadrangle map;
   c. a map indicating the search radius of the background research, as well as the locations where previous studies were conducted and where known historic resources exist and;
   d. photographs of the proposed project area.

4. A Phase I archaeological investigation of the totality (100%) of the proposed project's area of potential effect (APE) via the employ of a number of methods, including pedestrian survey that employs a transect interval of no more than 10 meters, shovel test probes, remote sensing, and/or deep testing via controlled units or trenching of

appropriate landscapes. The use of specific field methods and techniques must be justifiable and dependent upon the type and amount of ground cover present (visibility), the topographic setting (degree of slope, proximity to water, etc.), past land use (degree and nature of prior disturbance), probability of encountering previously undocumented resources during the proposed project (low, moderate, high probability), and the horizontal and vertical extent of planned disturbance. We strongly recommend that visibility equal 50% or greater of the ground surface area to use pedestrian survey/reconnaissance only. It is our position that areas that have not been disturbed in the past and/or high probability areas should be explored using sub-surface testing methods in addition to visual reconnaissance-based pedestrian survey. Additionally, we ask that there be no collection of artifacts or excavation of features during any Phase I archaeological survey.

The provision of this information will assist San Manuel Band of Mission Indians in ascertaining whether or not the Tribe will assume consulting party status under CEQA for specific projects and seek to participate in such projects' planning and implementation. If the requested information is in the process of being gathered by the Lead Agency and/or applicant at the time of the Agency's initial, formal notice to Tribe, simply indicate this within this notification/ scoping-based correspondence and provide the additional information upon its earliest availability, prior to the release of project permits and the commencement of any activities associated with project implementation. Please note, however, that if this information cannot be provided within the Tribe's 30-day response window, the Tribe automatically elects to be a consulting party under CEQA, as stipulated in AB 52.

Finally, please also be aware that sensitive and/or confidential information will not be shared with contractors/consultants. Furthermore, please note that any sensitive information shared by Tribe with the Lead Agency is not to be included within any publically disseminated document or public meeting, in accordance with PRC §21082.3(c).

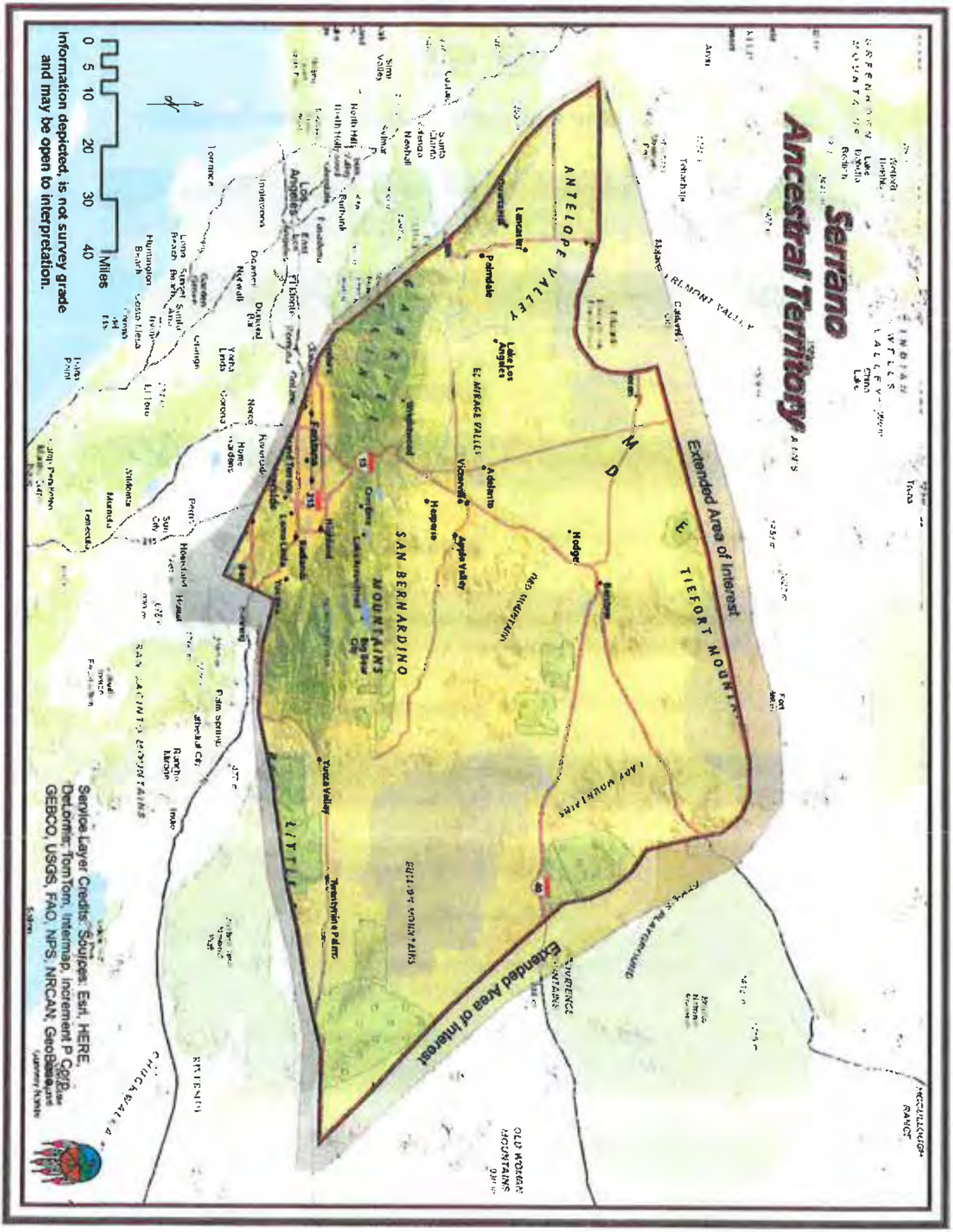
Should you require any clarification regarding the content of this communication or should you desire to meet in person to develop a mutually-effective working relationship, please do not hesitate to contact me at 909.864.8933 or lclauss@sanmanuel-nsn.gov.

Sincerely,

Lee Clauss

Lee Clauss, Director
Cultural Resources Management (CRM) Department

Attachments: Serrano Ancestral Territory Map
Timeline and Consultation Process Flow Chart


Serrano
Ancestral Territory
Extended Area of Interest
Extended Area of Interest
ANTELOPE VALLEY
SAN BERNARDINO MOUNTAINS
TIEFORT MOUNTAINS
Lancaster
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AB 52

Compliance Timeline and Consultation Process Flowchart

California Native American Tribe (Tribe) requests to be on Agency notification list PRC, § 21080.3.1(b)(1).

Agency decides to Undertake Project or Determines Project Application is Complete.

Within 14 Days

Lead agency provides formal notice to the Tribal contact on the list. PRC, § 21080.3.1(d).

Within 30 Days

The Tribe writes the lead agency requesting consultation on the project. PRC, § 21080.3.1 (b)(1).

Within 30 Days

Lead agency begins consultation with the Tribe PRC, § 21080.3.1(b).

Consultation can be an ongoing process.

Consultation ends when either:
1) Both Parties agree to measures to avoid or mitigate a significant effect on a TCR. Agreed upon mitigation measures shall be recommended for inclusion in the environmental document. PRC, § 21082.3(a)
OR
2) A Party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. PRC, § 21080.3.2(b)(1)-(2), PRC, § 21080.3.1(b)(1).

Release of Environmental Document

OFFICERS

DWAYNE CHISAM, P.E.
General Manager

MATTHEW KNUDSON
Assistant General Manager

HOLLY H. HUGHES
Secretary-Treasurer

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JUSTIN G. LANE
Division 4

ROBERT A. PARRIS
Division 5

MARLON BARNES
Division 6

CARY VAN DAM
Division 7

August 1, 2017

Lee Clauss
Director of Cultural Resources Management Department
San Manuel Band of Mission Indians
26569 Community Center Drive
Highland, CA 92346

Subject: Assembly Bill 52 – Native American Cultural Resources Government to Government Consultation – Antelope Valley – East Kern Water Agency High Desert Water Bank Project (CEQA SCH NO. 2017061030)

The Antelope Valley - East Kern Water Agency has prepared an Initial Study (IS) and Phase I Cultural Resources Report for a proposed project near Lancaster, CA, Los Angeles County. These documents are available for review at the Agency's website http://www.avek.org/index.cfm?fuseaction=page&page_id=5007
The proposed project consists of am approximately 1,500 acre groundwater bank. The project is bounded by Avenue A (Kern / Los Angeles County Line) on the north, 280th Street West on the east, 300th Street West on the west, and the California Aqueduct on the south in northwestern Los Angeles County. It is located in Sections 1, 2, 11, and 12 of Township 8 North, Range 17 West of the La Liebre Ranch United States Geological Survey (USGS) 7.5-minute quadrangle, as indicated on the enclosed map (Enclosure 1).

The Agency proposes the construction of a groundwater bank that will store State Water Project (SWP) water from various state water contractors and other partnering agencies throughout the State of California, including the Agency. This groundwater bank will store surface water conveyed via the California Aqueduct during wet weather years when SWP allocations exceed demands. The Agency then proposes to recover the stored water during dry and critical weather years when SWP allocations are low or disrupted.

The Agency's consultant, AECOM, has conducted a Phase I Cultural Resources Assessment attached here to for easy reference. The purpose of the assessment was to identify historical, cultural, and tribal cultural resources within the area of potential effect (APE) which may be impacted by the project, as well as to evaluate the potential for buried resources in the APE. The assessment included a Sacred Lands File search by the NAHC and a CHRIS records search in addition to an intensive pedestrian survey. The CHRIS records search identified no cultural resources of Native American origin within a 0.5-mile-radius of the project APE. The AECOM intensive pedestrian survey identified two isolated lithic flakes within the project APE.

The purpose of this letter is to acquaint you with this project, to seek out information and concerns you may be able to provide, and finally to provide you with an opportunity to request consulting party status pursuant to 36 CFR 800.2(c)(5) and 800.3(f) and AB 52. We request your input to help us identify and address your concerns with this project. Please provide the Agency with your comments to the address shown no later than 30 calendar days from receipt of this letter. In accordance with AB 52, all responses will be kept confidential and shared only with the appropriate agencies and planners.

Thank you very much for your assistance. Please feel free to contact me at 661-943-3201 or mknudson@avek.org if you have any questions about this project.

Sincerely,

MATTHEW KNUDSON,
Assistant General Manager

Enclosure:
1. Project Area Map
2. Phase I Cultural Resources Report

6500 WEST AVENUE N • PALMDALE, CALIFORNIA 93551
(661) 943-3201 • www.avek.org • info@avek.org

The mission of AVEK is to deliver reliable, sustainable and high quality supplemental water to the region in a cost-effective and efficient manner.

Garibay, Eric

From: Jessica Mauck <JMauck@sanmanuel-nsn.gov>
Sent: Thursday, September 07, 2017 2:04 PM
To: 'Matthew Knudson'
Cc: Garibay, Eric; Horn, Ben; 'Dwayne Chisam'
Subject: RE: AB52: 2017061030 - High Desert Water Bank Project

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Matt,

SMBMI has decided not to pursue consultation for the proposed project outside of the below language request, as it lies on the border of Serrano ancestral territory with no cultural resources located within the portion of the project area that lies within territory. SMBMI requests that the following language regarding inadvertent discoveries be made a part of the project/permit/plan conditions:

1. If human remains or funerary objects are encountered during any activities associated with the project, work in the immediate vicinity (within a 100-foot buffer of the find) shall cease and the County Coroner shall be contacted pursuant to State Health and Safety Code §7050.5 and that code enforced for the duration of the project.
2. In the event that Native American cultural resources are discovered during project activities, all work in the immediate vicinity of the find (within a 60-foot buffer) shall cease and a qualified archaeologist meeting Secretary of Interior standards shall be hired to assess the find. Work on the other portions of the project outside of the buffered area may continue during this assessment period. Additionally, San Manuel Band of Mission Indians will be contacted if any such find occurs and be provided information and permitted/invited to perform a site visit when the archaeologist makes his/her assessment, so as to provide Tribal input.
3. If significant Native American historical resources, as defined by CEQA (as amended, 2015), are discovered and avoidance cannot be ensured, an SOI-qualified archaeologist shall be retained to develop an cultural resources Treatment Plan, as well as a Discovery and Monitoring Plan, the drafts of which shall be provided to San Manuel Band of Mission Indians for review and comment.
    a. All in-field investigations, assessments, and/or data recovery enacted pursuant to the finalized Treatment Plan shall be monitored by a San Manuel Band of Mission Indians Tribal Participant(s).
    b. The Lead Agency and/or applicant shall, in good faith, consult with San Manuel Band of Mission Indians on the disposition and treatment of any artifacts or other cultural materials encountered during the project.

Note: San Manuel Band of Mission Indians realizes that there may be additional tribes claiming cultural affiliation to the area; however, San Manuel Band of Mission Indians can only speak for itself. The Tribe has no objection if the agency, developer, and/or archaeologist wishes to consult with other tribes in addition to SMBMI and if the Lead Agency wishes to revise the conditions to recognize additional tribes.

Please provide the final copy of the project/permit/plan conditions so that SMBMI may review the included language. This communication concludes SMBMI's input on this project, at this time, and no additional consultation pursuant to CEQA is required unless there is an unanticipated discovery of cultural resources during project implementation. That being said, I would strong encourage your agency to reach out to Tejon Indian Tribe, and other nearby tribes, as this project is very much within their area of concern and they would have much more information to offer during the cultural process. There is, of course, no obligation to do this, but this action would ensure due diligence has been taken for the cultural process. If you should have any further questions with regard to this matter, please do not hesitate to contact me at your convenience.

Respectfully,

Jessica Mauck
CULTURAL RESOURCES ANALYST
O: (909) 864-8933 x3249
M: (909) 725-9054
26569 Community Center Drive, Highland California 92346
SAN MANUEL
BAND OF MISSION INDIANS

From: Matthew Knudson [mailto:mknudson@avek.org]
Sent: Wednesday, August 30, 2017 7:22 PM
To: Jessica Mauck
Cc: 'Eric Garibay (eric.garibay@aecom.com)'; Horn, Ben; Dwayne Chisam
Subject: RE: AB52: 2017061030 - High Desert Water Bank Project

Hi Jessica –

Thank you for getting back to us. The only other tribe which requested to be notified and not listed in the NAHC Contact Program was the San Gabriel Band of Mission Indians. A similar notice was sent to them, but we have not received a response to date. There was no notice issued to the Tejon Indian Tribe as they were not listed by the NAHC.

If the San Manuel Band of Mission Indians wishes to have formal consultations, please let us know as soon as possible.

Thank you,
Matt

Matthew Knudson
Assistant General Manager
AVEK
6500 West Avenue N
Palmdale, CA 93551
Office (661) 943-3201
Cell (661) 466-3350
mknudson@avek.org

From: Jessica Mauck [mailto:JMauck@sanmanuel-nsn.gov]
Sent: Wednesday, August 30, 2017 3:45 PM
To: Matthew Knudson <mknudson@avek.org>
Cc: 'Eric Garibay (eric.garibay@aecom.com)' <eric.garibay@aecom.com>
Subject: RE: AB52: 2017061030 - High Desert Water Bank Project

Hi Matt,

The list of tribes with ties to the area that AECOM received from the NAHC is quite small. Do you know if the notice for this project from your Agency was sent to Tejon Indian Tribe? They often consult in this area and if they initiate consultation on this project then I will choose to defer to them. Please do let me know if another tribe with ties to the region responds to your notice. If I do not hear from you that any other tribes have initiated consultation on this project by the end of the 30-day deadline on 8 Sept 2017 (next Friday), then SMBMI automatically requests to consult.

Regards,

Jessica Mauck
CULTURAL RESOURCES ANALYST
O: (909) 864-8933 x3249
M: (909) 725-9054
26569 Community Center Drive, Highland California 92346
SAN MANUEL
BAND OF MISSION INDIANS

From: Jessica Mauck
Sent: Wednesday, August 30, 2017 11:22 AM
To: 'Matthew Knudson'
Cc: 'Eric Garibay (eric.garibay@aecom.com)'
Subject: RE: AB52: 2017061030 - High Desert Water Bank Project

Hi Matt – the file just came in. I will review and get back to you before COB today.

From: Matthew Knudson [mailto:mknudson@avek.org]
Sent: Wednesday, August 30, 2017 11:11 AM
To: Jessica Mauck
Cc: Eric Garibay (eric.garibay@aecom.com)
Subject: RE: AB52: 2017061030 - High Desert Water Bank Project

Hi Jessica – The following email was bounced back because the file was too large, so you should have received the requested document via "We Transfer". Please confirm that you received the document successfully.

Thank you,
Matt

Matthew Knudson
Assistant General Manager
AVEK
6500 West Avenue N
Palmdale, CA 93551
Office (661) 943-3201
Cell (661) 466-3350
mknudson@avek.org

From: Matthew Knudson
Sent: Wednesday, August 30, 2017 8:35 AM
To: 'Jessica Mauck' <JMauck@sanmanuel-nsn.gov>
Cc: Dwayne Chisam <dchisam@avek.org>; 'Horn, Ben' <Ben.Horn@aecom.com>; Eric Garibay (eric.garibay@aecom.com) <eric.garibay@aecom.com>
Subject: RE: AB52: 2017061030 - High Desert Water Bank Project

Hi Jessica –

Thank you for your response. Per your request, attached is the Confidential Appendix B and C of the Phase I Cultural Report. Please let us know if you have any questions or would like to meet to discuss?

Thank you,
Matt

Matthew Knudson
Assistant General Manager

6500 West Avenue N
Palmdale, CA 93551

Office (661) 943-3201
Cell (661) 466-3350

mknudson@avek.org

From: Jessica Mauck [mailto:JMauck@sanmanuel-nsn.gov]
Sent: Tuesday, August 29, 2017 10:19 AM
To: Matthew Knudson <mknudson@avek.org>
Subject: AB52: 2017061030 - High Desert Water Bank Project

Hello Matthew,

Thank you for contacting the San Manuel Band of Mission Indians (SMBMI) regarding the above referenced project. SMBMI appreciates the opportunity to review the project documentation, which was received by our Cultural Resources Management Department on 8 Aug 2017, pursuant to CEQA (as amended, 2015) and CA PRC 21080.3.1. The northeast corner of the proposed project area exists within Serrano ancestral territory and, therefore, is of interest to the Tribe. Can you please provide the confidential appendices so that SMBMI may determine a) if any cultural findings were within Serrano ancestral territory, and b) which tribes initially responded to the CRM firm during the information sharing process. Due to the project being on the edge of Serrano territory, as well as outside of it, SMBMI takes other tribes and their communications into consideration when deciding how to move forward with consultation.

The provision of this information will assist San Manuel Band of Mission Indians in ascertaining how the Tribe will assume consulting party status under CEQA and participate, moving forward, in project review and implementation. Please note, however, that if this information cannot be provided within the Tribe's 30-day response window, the Tribe automatically elects to be a consulting party under CEQA, as stipulated in AB52. Additionally, the CRM Department asks that the requested information be disseminated digitally via e-mail, FTP site, or some other similar technology.

Please understand that receipt of this letter does not constitute "meaningful" tribal consultation nor does it conclude the consultation process, and may be followed up with additional emails, phone calls or face-to-face consultation if

deemed necessary. If you should have any further questions with regard to this matter, please do not hesitate to contact me at your convenience, as I will be your Point of Contact (POC) for SMBMI with respect to this project.

Once again, the San Manuel Band of Mission Indians appreciates the opportunity to comment on this proposed project.

Respectfully,

Jessica Mauck
CULTURAL RESOURCES ANALYST
O: (909) 864-8933 x3249
M: (909) 725-9054
26569 Community Center Drive, Highland California 92346
SAN MANUEL
BAND OF MISSION INDIANS

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STATE OF CALIFORNIA - CALIFORNIA STATE TRANSPORTATION AGENCY

DEPARTMENT OF TRANSPORTATION
DISTRICT 7- OFFICE OF REGIONAL PLANNING
100 S. MAIN STREET, SUITE 100
LOS ANGELES, CA 90012
PHONE (213) 897-6536
FAX (213) 897-1337
TTY 711
www.dot.ca.gov

Serious Drought. Making Conservation a California Way of Life.

July 13 2017

Mr. Dwayne Chisam
Antelope Valley-East Kern Water Agency
6500 West Avenue N
Palmdale, Ca 93551

RE: High Desert Water Bank
Vic. LA-138/PM 10.511
SCH#2017061030
GTS#07-LA-2017-00964ME-MND

Dear Mr. Chisam:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above referenced project. The proposed project would develop and operate a groundwater bank on approximately 1,500 acres of land in the western edges of the Antelope Valley. The project would store State Water Project water supplies from the Agency and other western edges of the Antelope Valley.

The nearest State facility to the proposed project is State Route 138. Based on review, Caltrans does not expect project approval to result in a direct adverse impact to the existing State transportation facilities.

As a reminder, any transporting of heavy construction equipment and/or materials which require the use of oversized-transport vehicles on State highways will require a Caltrans transportation permit. Caltrans recommends that large size truck trips be limited to off-peak commute periods.

In the Spirit of mutual cooperation, Caltrans staff is available to work with your planners and traffic engineers for this project, if needed. If you have any questions regarding these comments, please contact project coordinator Ms. Miya Edmonson, at (213) 897-6536 and refer to GTS# LA-2017-00964ME

Sincerely,

Melanie Bradford for
DIANNA WATSON
IGR/CEQA Branch Chief

cc: Scott Morgan, State Clearinghouse

"Provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability"

AECOM

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Suite 100
Bakersfield, CA 93309
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661.283.2323 tel
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July 25, 2017

Diana Watson
IGR / CEQA Branch Chief
State of California
Department of Transportation
District 7 Office of Regional Planning
100 S. Main Street, Suite 100
Los Angeles, CA 90012

RE: High Desert Water Bank Project, Community of Neenach; Los Angeles County, California SCH No. 2017061030

The Antelope Valley – East Kern Water Agency (Agency) thanks you for your interest on the project and has acknowledged your comments pertaining to the High Desert Water Bank Project. The Agency will be working with the Department in the procurement of Caltrans Transportation Permits if needed for the transportation of heavy or oversized equipment and materials throughout the implementation of the project.

Should there be the need for additional information, please do not hesitate to give me a call or send me an email at eric.garibay@aecom.com

Yours Sincerely,

Eric Garibay, PE
Senior Engineer

Project Number	60537613.0004
Attachments:	None
Copy:	Dwayne Chisam / AVEK Matt Knudson / AVEK Ben Horn / AECOM Alec Stevenson / AECOM Shay Lawrey / Jericho Systems Inc

Antelope Valley – East Kern Water Agency

High Desert Water Bank

California Environmental Quality Act (CEQA)

Mitigated Negative Declaration

SCH No. 2017061030

Mitigation Monitoring and Reporting Program

December 2017

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1. General

The Mitigated Negative Declaration (MND) for the Antelope Valley – East Kern Water Agency (AVEK or Agency) High Desert Water Bank (the Project) specified a number of mitigation measures to be undertaken during implementation of the proposed project. During implementation, it is essential that all of these be fully complied with and that compliance be documented in a timely manner. Failure to comply with and or document compliance could result in a challenge to the project that could result in project delays.

This Mitigation Monitoring and Reporting Program (MMRP) has been prepared for the project and has been adopted concurrently with the findings of the Initial Study and Mitigated Negative Declaration. This plan is intended to track compliance of all of the mitigation measures adopted with the Mitigated Negative Declaration.

2. Responsibility for Compliance and Documentation

Implementation of the MMRP will be the responsibility of the Agency. The Agency will assign a project manager to oversee all aspects of implementation of the proposed project and ensure that the mitigation and monitoring commitments made in the MND are carried out in a timely and effective manner. In implementing the MMRP, the Agency will often rely on the expertise of outside consultants and contractors. To ensure the effectiveness of this mitigation and monitoring, the Agency will:

- Make the MMRP an element of all project-related requests for proposals and contract specifications, specifying that construction contractors will be responsible for appropriate acquisition of permits for construction and implementation of relevant mitigation and monitoring elements, as specified in this MMRP;
- Independently review contractor compliance on a regular basis and require corrective actions in a timely manner when the Agency determines that such actions are required;
- Maintain files, open to the public for inspection, documenting compliance with the MMRP;
- Designate an Agency staff member to receive and respond to all public and Agency comments, complaints, and/or questions regarding compliance with the MMRP; and
- Provide regulatory agencies with appropriate and timely documentation of compliance as specified in regulatory permits issued for the proposed project.

Additionally, the Agency will require that construction contractors designate a principal mitigation and monitoring manager (Principal) and back-up mitigation and monitoring manager (Alternate) and shall ensure that at least one of these is on-site during all phases of construction. These persons may perform other tasks, but shall have adequate time, training, and expertise to perform the required monitoring and documentation. The Principal shall be the contractor's construction field supervisor or assistant field supervisor. The Principal or Alternate shall independently verify compliance with required mitigation measures and shall indicate verification by filling out and signing the appropriate compliance checklist, thereby certifying compliance with all measures.

3. Permits and Coordination

The MND identifies a number of permits which may need to be obtained for various aspects of the Proposed Project, as well as commitments to coordinate design, pre-construction, and

construction activities with various local, regional, State, and Federal agencies. Permits and coordination commitments are:

- Encroachment Permits for any work within Public Right of Way.
- National Pollutant Discharge Elimination System Construction Activities General Permit.
- Department of Water Resources Turnout Construction and Operations Permit.
- Department of Water Resources Encroachment Permit (if needed)
- Caltrans heavy or oversized equipment Transportation Permit (if needed).

4. Incidents and Compliance Reporting

Timely reporting of compliance and of any incidents which may result in non-compliance is essential. Contracts for construction and for independent compliance contractors shall therefore specify that, if the designated construction contractor for an activity determines that any aspect of construction is not in substantive compliance with the mitigation requirements for the activity, the contractor shall immediately take action to remedy the problem. The designated Principal or Alternate shall notify the Agency within not more than 24 hours following determination that any aspect of construction activity is not in compliance with mitigation requirements, shall explain how the incident has been addressed, and shall provide any other information requested by the Agency. Following action to address the out-of-compliance incident, the designated Principal or Alternate must complete an "incident report" and submit a copy of the report to the Agency's project manager within one week of the incident.

5. Mitigation and Monitoring Program Update

The Agency recognizes that laws, regulations, and policies related to construction activities may change during construction. The Agency's project manager is responsible for periodically reviewing the status of laws, regulations, and guidelines applicable to their construction activity. The Agency will implement any new rules in effect at the time of approval.

6. Staff Awareness

Staff must be informed of mitigation and monitoring requirements prior to construction. New staff must be oriented when they come on site. The Principal/Alternate therefore needs to review compliance requirements and monitoring requirements for the job with all personnel on site to ensure that they know the requirements, know the importance of compliance, know that violations must be reported, and know that compliance is a condition of employment on this job. Similarly, a summary list of mitigation and monitoring requirements shall be posted in a conspicuous location at the job site so that they may be referred to at any time.

7. Training

If specialized expertise is necessary for mitigation or monitoring, Agency staff or the delegated construction contractor shall provide such training to the persons responsible for compliance and/or monitoring. For example, if biological pre construction surveys identify the presence of a special status species, the Agency shall retain the services of a qualified biologist familiar with this species to provide environmental training for the identification and protection of same.

8. On Going Documentation

Compliance will be monitored on a timely basis, depending on the nature of the activity and the

Mitigation requirement. Where appropriate. photo documentation of pre-construction conditions, of activities during construction, of any incidents that may constitute a violation of mitigation requirements, and of post construction conditions are encouraged. However, if photo documentation is adopted as a monitoring tool, it must be used consistently to ensure that there are records of all activities for which compliance must be documented. Labels must be explanatory and contain adequate information about the photographer, date, time, and conditions when the photo was taken. Photo documentation shall be backed up with paper copies and/or records on CD/DVD. Agency staff may audit records of compliance with mitigation and monitoring requirements at any time and compliance records must be readily available and in good order. Logs of mitigation and monitoring compliance should be maintained and supporting documentation should be provided in parallel to the log. The Agency and its project manager and other contractors will maintain such records in a form suitable for the required monitoring and reporting. It is anticipated that contractors will generally have appropriate monitoring templates for typical construction activities. In other cases, the format of compliance monitoring records may be available from the regulatory Agency approving the monitoring (if any).

9. Pre-Construction Training

Prior to initiation of construction activity, the Agency will review the mitigation commitments in this MMRP and will determine the need for pre-construction training. The Agency and its contractors will prepare appropriate training materials and provide appropriate training to construction staff to ensure that they fully understand compliance and reporting requirements. It is anticipated that pre-construction training may be necessary for the following:

- Activities that involve excavation (cultural, biological, dust, noise, traffic)
- Activities that involve use of heavy equipment (dust, noise)
- Activities in the vicinity of trees (biological)
- Activities in the vicinity of public and private utilities

10. Mitigation and Monitoring Requirements

The following includes a list of all of the mitigation measures identified in the MND.

AGRICULTURAL RESOURCES

AG-1: Prime Farmland Avoidance – The Agency will not perform recharge operations on the 60 acres of semi active farmed Prime Farmland on the northwest corner of the property.

AIR QUALITY

AQ-1: Minimization Measure for NOx Related Emissions - Construction contractor shall use off road construction diesel engines that meet, at a minimum, the Tier 4 interim California Emissions Standards, unless such an engine is not available for a particular item of equipment. Tier 3 engines will be allowed on a case by case basis when the contractor has documented that no Tier 4 interim equipment or emissions equivalent retrofit equipment is available for a particular equipment type that must be used to complete construction. Documentation shall consist of signed written statements from at least two construction equipment rental firms.

BIOLOGICAL RESOURCES

BIO-1 : Burrowing Owls – Prior to ground-disturbing activities and other habitat disturbance, clearance surveys for active burrowing owl burrows shall be conducted of all areas subject to disturbance. Prior to ground-disturbance associated with construction of the Project, including vegetation clearance and grubbing, preconstruction clearance surveys shall be conducted by a

qualified biologist within the Project site and a 500-foot buffer of the site in order to locate active burrowing owl burrows. Pre-construction clearance surveys shall be conducted no more than two (2) weeks prior to construction. Surveys will be conducted following guidelines provided in the *Staff Report on Burrowing Owl Mitigation* (CDFW 2012).

Within two (2) weeks prior to inundation, trained AVEK personnel shall review all areas subject to inundation for presence of burrows with entrances suitable for burrowing owl occupation and potential burrowing owl sign. Any identified potentially occupied burrows will be investigated further by a qualified biologist prior to inundation. Training will be conducted by a qualified biologist for AVEK personnel who conduct pre-inundation surveys prior to the commencement of the first inundation survey. Training will discuss burrowing owl identification and sign and burrow recognition, their status, and the laws governing their protection. Training will be conducted by a qualified biologist on an annual basis for all Project operations personnel as a refresher.

If no burrowing owls are detected, no further mitigation will be required. If burrowing owls are observed during any survey, the following measures will be implemented:

- Occupied burrows will not be disturbed during the nesting season (April 1 through October 15).
- Occupied burrows will not be subject to inundation during operation of the water bank.
- Avoidance shall be the preferred approach for occupied burrows whenever feasible. If occupied burrows are observed during the non-breeding season (October 16 through March 31), a 160-foot buffer will be established; no construction or other physical work activities will occur within the buffer. If occupied burrows are observed during the breeding season (April 1 through October 15), a 650-foot buffer shall be established; no construction or other physical work activities will occur within the buffer.
- When destruction of occupied burrows is unavoidable, destruction shall occur only during the non-nesting season (October 16 through March 31). Prior to destruction of occupied burrows within the Project site, any unsuitable burrows outside the disturbance footprint will be enhanced (enlarged, cleared of debris) to facilitate occupation.
- If owls must be moved away from the Project area, passive relocation techniques (e.g., installation of one-way exclusion doors at burrow entrances) will be used instead of trapping. ~~A~~ Passive relocation techniques will be employed for a minimum of one week in order to allow owls to acclimate to alternate burrows.

In order to provide protections for burrowing owls throughout construction and operations of the Project, a Burrowing Owl Protection Plan shall be developed prior to construction of the recharge basins. This plan will provide acceptable strategies for avoiding and minimizing impacts to burrowing owls and burrowing owl habitat on the Project site.

BIO-2 : Desert Kit Fox and American Badger – Clearance surveys for occupied desert kit fox and American badger dens shall be conducted prior to any Project disturbance activities, including initial construction and ongoing operations such as inundation of the recharge basins.

Within two (2) weeks prior to the start of construction, a qualified biologist shall conduct pre-construction clearance surveys of the work area and a 150-foot buffer for signs of desert kit fox and American badger, including active and inactive natal and non-natal dens, scat, prey remains, and tracks. All suitable denning locations shall be investigated for use.

Within two (2) weeks prior to inundation of the basins, trained AVEK personnel shall review all areas subject to inundation for potential sign of American badger or desert kit fox, including active and inactive natal and non-natal dens. Any identified potential sign of presence will be investigated further by a qualified biologist prior to inundation. Training will be conducted by a qualified biologist for AVEK personnel who conduct pre-inundation surveys prior to the commencement of the first inundation survey. Training will discuss American badger and desert kit fox identification and sign and den recognition, their status, and the laws governing their protection. Training will be conducted by a qualified biologist on an annual basis for all Project operations personnel as a refresher.

If dens are observed, the following measures will be implemented:

- Occupied dens will not be subject to inundation during operation of the water bank.
- Inactive dens shall be excavated by hand with a shovel to prevent badgers/kit foxes from re-using dens during construction.
- If active natal dens are observed during the survey, a buffer of 300 feet shall be established around the den; no construction or work activities will occur within the buffer. The den shall be monitored and the buffer maintained until a qualified biologist has determined that the den is no longer active, at which time it shall be excavated by hand to prevent re-use. Passive relocation of American badger and desert kit fox shall not take place while young are still in dens and dependent on the parents for food, or while females may be pregnant.
- If active, non-natal dens are observed within the Project site or buffer, badgers/kit foxes shall be discouraged from using these dens prior to clearing, grubbing, and/or grading of the site, by partially blocking the entrance of the den with sticks, debris, and soil for 3 to 5 days. Access to the den shall be incrementally blocked to a greater degree over this period, encouraging the badger/kit fox to vacate the den of its own volition. After badgers/kit foxes have stopped using active dens within the Project boundary, the dens shall be hand-excavated with a shovel to prevent re-use.
- If newly active badger/kit fox dens are found during construction activities, all work in the area shall cease until the biologist can safely close the den.
- If a desert kit fox or American badger is encountered during Project activities, all work that could result in a direct injury, disturbance, or harassment shall immediately stop and the Project biologist shall be notified.
- Where desert kit foxes have the potential to occur, all heavy equipment and vehicles left on-site overnight will be inspected at the beginning of each work day to verify that no individuals have taken shelter under the equipment. If a desert kit fox is observed, the project biologist shall be notified and the animal shall be observed from a distance until it has moved out of the area of its own accord.

BIO-3 : Nesting Birds - If construction activities occur within the breeding bird season (February 1 through September 15), all vegetation clearing and initial ground disturbing activities will be preceded by a nesting bird survey. Nesting bird surveys will be conducted by a qualified biologist of all areas that may support nesting and will be subject to disturbance, as well as a 300-foot buffer for passerine species and 500-foot buffer for raptors. Surveys will be conducted no more than 7 days prior to construction activities.

- If an active nest is observed, a no-disturbance buffer will be established until a qualified biologist has determined the nest has either failed or has successfully fledged and the young are no longer dependent on the nest. The no-disturbance buffer will measure no less than 500 feet for raptors, and 300 feet for all other species.

BIO-4 : Animal Movement and Entrapment (Trenches) - All trenches that are to be left open overnight shall be either securely covered or have wildlife escape ramps installed during non-work hours to prevent entrapment of common and special-status wildlife species. All steep-walled pipeline and utility trenches shall be inspected in the mornings and prior to backfilling to prevent mortality of common and special-status wildlife species. All entrapped wildlife shall be removed or allowed to escape voluntarily via escape ramps prior to construction resuming.

BIO-5 : Animal Movement and Entrapment (Pipes) – All pipes, culverts, or similar structures on-site with a diameter of 2 to 24 inches shall be inspected for special-status species prior to moving or welding. Openings shall be capped or otherwise covered if sections cannot be inspected to prevent the entry and potential loss of wildlife. If a common or special-status species is discovered inside a pipe, the animal shall be safely removed by a qualified biologist. The pipe segment shall not be moved until the animal has escaped, or the pipe segment shall be moved a single time out of the path of construction. Alternatively, stored pipe may be kept capped at all times until used during construction. Vertical, open-ended pipes used as fence posts, property line demarcations, sign posts, etc., will be capped or otherwise plugged to prevent the entrapment and possible injury and mortality of wildlife.

BIO-6 : Erosion and Sediment Control - Best available erosion and sediment control measures will be employed to prevent downstream dispersal of sediments during and following Project-related activities. These measures may include sediment basins, gravel bags, silt fences, geo-bags, or gravel and geotextile fabric berms, erosion control blankets, coir rolls, jute net, and straw bales. The use of erosion control materials potentially harmful to wildlife species, including monofilament netting (erosion control matting) or similar material, will not be employed.

BIO-7 : Special-Status Plants - Prior to construction of the recharge basins, floristic surveys shall be conducted of all potentially suitable habitats on the Project site. Floristic surveys shall be conducted by a qualified biologist following CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW 2009). If no special-status plants are observed, no further mitigation will be necessary. If special-status plants are observed during surveys, the following measures will be implemented:

- Individuals will be protected in place to the extent feasible through implementation of avoidance and buffers.
- If special-status plant individuals or populations must be impacted, individuals will be salvaged and/or transplanted to suitable habitat within the established on-site habitat management lands. If salvage is not feasible, mitigation at a 2:1 ratio will be provided within habitat management lands. In the case of annual species, top soil salvage may be employed to preserve the existing seed bank where appropriate enhancement of existing populations may be employed at the same 2:1 ratio.

BIO-8 : Swainson's Hawk - Prior to construction of the recharge basins, focused Swainson's hawk surveys shall be conducted. Surveys for Swainson's hawk shall be conducted by a qualified biologist following the methods outlined in Swainson's Hawk Survey Protocols, Impact Avoidance, and Minimization Measures for Renewable Energy Projects in the Antelope Valley of Los Angeles and Kern Counties, California (CDFW 2010). Surveys shall include all potential Swainson's hawk nesting habitat within a 5 mile radius of the Project site. Surveys shall include all potential nest trees, towers or other potential nest sites (including nests used within the last 5 years) outside the nesting season for Swainson's hawk.

If no active Swainson's nests are observed, no further mitigation will be necessary. If an active Swainson's hawk nest is detected during focused surveys, the following measures will be

implemented:

- No removal of active Swainson's hawk nests will be conducted during Project construction and/or operations.
- No construction activities will be conducted within a 0.5-mile radius of an active Swainson's hawk nest. Prior to construction activities, a qualified biologist will conduct a focused Swainson's hawk nest survey within an up to 0.75-mile radius of proposed construction activities to identify any active nests.
- If active Swainson's hawks nests are identified within a 0.5-mile radius of the Project site, a Habitat Management Plan will include specific, detailed measures to avoid and minimize impacts to Swainson's hawks in or near the Project site during both construction and operation of the Project.

BIO-9 : Tri-colored Blackbirds - While the Initial Study indicates that impacts to tricolored blackbird foraging habitat due to Project-related activities are less than significant, at the request of the CDFW focused nesting season surveys will be conducted as follows: Prior to construction of the recharge basins, focused nesting tri-colored blackbird surveys shall be conducted of all potentially suitable nesting habitats and documented nesting colonies within the Project site and within a 3-mile radius of the Project site for any active nesting colonies.

BIO-10 : Jurisdictional Drainages and Wetlands - Prior to construction of the recharge basins or any ground-disturbing activities within waterways and wetlands on the site, a formal Jurisdictional Delineation will be conducted of all potential jurisdictional waters within the Project site. Fill or disturbance of any jurisdictional waters or wetlands will be permitted through the appropriate agency (i.e., Sections 401 and 404 of Clean Waters Act, or Section 1600 of California Fish and Game Code). Impacts to jurisdictional waters and wetlands will be avoided to the extent feasible, and shall not occur prior to issuance of any required local, state, and federal permits.

BIO-11 : Habitat Mitigation - AVEK will designate a significant allotment of land as habitat management lands. The purpose of these areas is to provide foraging habitat for Swainson's hawk, tricolored blackbird, nesting and foraging habitat for burrowing owl, and denning and foraging habitat for desert kit fox and American badger. The details of the management of these lands shall be described in a *Habitat Management Plan* to be prepared prior to construction of the recharge basins.

BIO-12 : General Biological Measures –

Worker Environmental Awareness Training - Prior to construction, a Worker Environmental Awareness Training shall be prepared and presented by a qualified biologist to all construction personnel at the start of Project-related activities. The training shall discuss sensitive-status species with the potential to occur within the Project footprint, including their regulatory status, description, and habitat requirements, and any sensitive habitat areas that may be encountered. The program shall emphasize the importance of minimizing disturbance, and describe the federal, state, and local regulations protecting biological resources and the potential penalties for non-compliance with these laws and statutes.

Equipment Staging - All construction equipment, staging areas, materials and personnel shall be restricted to existing roadways and road shoulders, designated work areas, or previously disturbed off-site areas that are not habitat for special-status species.

Site Cleanliness - All trash and food items shall be contained and removed from the site regularly to prevent attracting predators and scavengers, such as dogs, coyotes, desert kit fox, or common ravens, to the Project area.

Hazardous Waste Cleanup - Any spills of petroleum products or other chemicals, which may represent a hazard to wildlife, shall be cleaned up promptly and in accordance with appropriate laws and regulations.

CULTURAL RESOURCES

CR-1: Cultural Resources Monitoring – The Project site has been identified to have a low to moderate potential of finding significant archaeological resources lacking surface manifestations that may be encountered during Project construction. To lessen the impact of unknown archeological resources, the Agency will develop a Cultural Resources Monitoring and Mitigation Plan prior to start of ground disturbance. This plan will implement part time monitoring by a qualified archeologist and or a Native American Monitor. In the event that project construction activities result in a finding of significant importance, the qualified archeologist may increase the level of monitoring. If no findings occur during the part time monitoring, the archeologist may further reduce or eliminate the monitoring. During a find of a potentially significant archaeological resource, the resource will be inventoried and evaluated to ascertain whether the resource meets the criteria for listing on the California Register of Historical Resources. After the discovery, all work being conducted within the vicinity of the discovery will be halted or diverted away from the site of discovery until a qualified archaeologist can assess the potential significance of the find.

CR-2: Regulation Compliance – The Agency will comply with Health and Safety Code Section 7050.5, CEQA Section 15064.S(e), and Public Resources Code Section 5097.98, which mandate the process to be followed in the unlikely event of an accidental discovery of any human remains in a location other than a dedicated cemetery.

GEOLOGY AND SOILS

GEO-1: SWPPP - To control water and wind erosion during construction and operation of the Project, the Agency will prepare a Stormwater Pollution Prevention Plan (SWPPP) in compliance with the requirements of the National Pollutant Discharge Elimination System (NPDES) Construction General Permit.

GEO-2: Seismic Design - Although the proposed Project has little inherent potential for causing seismic safety effects, the Agency will ensure that all facilities are designed to withstand the anticipated seismic forces, consistent with local and State building codes and relevant regulations.

GEO-3: Pipeline Shut Off Valves - The Agency will install shut off valves on major pipelines to minimize the potential for flooding during seismic events.

GEO-4: Groundwater Monitoring Plan - Although the potential for the Project to raise groundwater levels to within 30 to 50 feet of the ground surface is small, to address potential impacts to local groundwater levels, the Agency will develop a monitoring program to monitor changes in water levels in the area affected by groundwater recharge operations. If monitoring identifies groundwater level rise to 75 feet below ground surface, the Agency will modify management of recharge to prevent water levels from rising to levels where liquefaction effects could occur. The Groundwater Monitoring Plan will also include provisions for monitoring of groundwater quality and the development of a native groundwater quality baseline which would be identified prior to commencement of recharge operations.

HAZARDS AND HAZARDOUS MATERIALS

HAZ-1: Spill Prevention Plan - Consistent with Agency's existing practices, the Agency will require from its construction contractors the preparation and implementation of a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities and operations. The plan and methods shall be in conformance with all State and Federal regulations. The Agency shall provide for routine inspection of the construction and operations areas to verify that the measures specified in the SPCCP are properly implemented and maintained and further ensure that contractors are notified immediately if there is a noncompliance issue and will require compliance.

HAZ-2 : Bird Strike Hazard Notification - The Agency will notify the Flight Safety Office at Edwards Air Force Base and all local airports of the potential bird strike hazard as follows:

- Prior to application of water to the recharge basins, and
- If large birds or large concentrations of small birds are observed in or near the recharge area.

HAZ-3: Bird Strike Hazard Minimization Measures - The Agency will implement actions to reduce the attractiveness of the recharge basins to birds by:

- Use of recharge basins with shallow water depths which will be generally unsuitable for the larger migratory birds,
- Monitor recharge area water and if aquatic macroinvertebrates are found to be developing in large numbers and/or foraging by shorebirds is observed, temporarily dry out recharge areas, thereby reducing the insect and aquatic macroinvertebrate forage that would attract and hold shorebirds.
- Whenever water is present in the recharge basins, the project operator will monitor the basins daily for bird activity and if found discourage their use via means acceptable to the Department of Fish and Wildlife.

HAZ-4: Mosquito Borne Disease Minimization Measures – The Agency will consult with the Antelope Valley Mosquito and Vector Control District to develop and implement a mosquito management plan. The plan would consist of a Project specific mosquito abatement program that would include quantitative abatement thresholds. The Agency and/or its representative would monitor mosquito larvae production in the recharge basins, drainages, and distribution. Larvae populations would be tracked using methods and thresholds approved by the Mosquito Abatement District, and suppression measures would be employed when thresholds are exceeded. The primacy mode of suppression would be to monitor for mosquito presence and if mosquito larvae are found, to cycle recharge temporarily so that units of recharge would be dried.

HYDROLOGY AND WATER QUALITY

HWQ-1: Drainage Design - Recharge areas will be constructed so that they will not divert sheet flooding and other runoff away from the recharge areas. This will allow flood water to flow into the recharge areas where flows will be somewhat retarded by the recharge berms. Berms will be designed with berm heights below the calculated flood depth elevations and intended to be sacrificial. Flood flows would enter the site, go through the berms, overtop or destroy the

berms in sequence, and eventually exit the project site along the eastern boundary of the proposed project in a manner similar to pre-project conditions.

HWQ-2: **Stormwater Pollution Prevention Plan (SWPPP)** - To reduce or eliminate Construction related water quality effects, before onset of any construction activities, the Agency or its contractor will prepare a Storm Water Pollution Prevention Plan. The SWPPP will include temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover). These measures will be employed to control erosion from disturbed areas. Measures for the control of pollutants during construction include:

- Use of existing access points to minimize dust and tracking materials onto Public Streets,
- Designated Parking, Storage, and Service Areas protected by silt fence and oil absorbents and sloped to control drainage,
- Minimize diesel storage,
- Stockpile spill cleanup materials,
- Regular vehicle inspection for leaks.
- Fuel off-channel with a secondary containment system for spills,
- Use quick connects whenever possible,
- Fueling by authorized personnel only, and
- Spill cleanup materials readily available.

The SWPPP shall include a Fugitive Dust Control Plan (FDCP) that will include extensive measures to control and manage soil erosion. The FDCP will provide for management of open soils that will contribute to management of runoff.

Consistent with the SWPPP and the Agency's current construction management practices, the Agency or its agent will perform routine inspections of the construction area to verify that the BMPs specified in the SWPPP are properly implemented and maintained. The Agency will notify its contractors immediately if there is a noncompliance issue and will require compliance.

HWQ-3: Spill Prevention Plan - Consistent with Agency's existing practices, the Agency will require from its construction contractors the preparation and implementation of a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities and operations. The plan and methods shall be in conformance with all State and Federal regulations. The Agency shall provide for routine inspection of the construction and operations areas to verify that the measures specified in the SPCCP are properly implemented and maintained and further ensure that contractors are notified immediately if there is a noncompliance issue and will require compliance.

HWQ-4: Protection of Off Site Wells. To address potential impacts to groundwater and adjacent well owners, the Agency will develop a monitoring program to monitor changes in water levels and well production in the area affected by groundwater recharge operations. The program will specify that:

- Extractions of groundwater shall not exceed 90% of the amount of water recharged,
- Water quality in recovered water and in groundwater flowing away from the Project will be monitored to ensure that water quality remains appropriate for designated beneficial uses,

- During recharge operations, water levels will be monitored and recharge operations will be suspended in the event that offsite water levels rise to within 75 feet of the ground surface, and
- During recovery operations, water levels in offsite wells will be monitored and operations will be adjusted if offsite wells are found to be adversely affected by project operations,

HWQ-5: Management of Herbicides and Pesticides - The Agency will comply with all regulations of the California Department of Pesticide Regulation regarding the use of herbicides and pesticides in areas designated for groundwater recharge.

NOISE

NOISE-1: Construction Noise Monitoring and Minimization Measures – The Agency and its construction contractors will monitor noise levels for construction activities near and along 280th Street West corresponding to the eastern boundary of the proposed Project area which includes potential noise receptors (residential homes). In the event that noise levels exceed the County of Los Angeles designated thresholds, the construction contractor will implement noise reduction measures to include:

- Providing construction equipment with sound control devices.
- With the exception of well drilling operations, restrict construction activities to day time hours.
- In the event that construction activities occur close to sensitive noise receptors, implementing appropriate additional noise mitigation measures, including but not limited to:
    - Changing the location of stationary construction equipment,
    - Shutting off idling equipment,
    - Rescheduling construction activity
    - Notifying adjacent residents in advance of construction work, and
    - Installing acoustic barriers around stationary construction noise sources.

NOISE-2: Operation Noise Minimization Measures – The Agency proposes to construct approximately 7 groundwater wells in the vicinity of 280th St. West which have the potential to increase the ambient noise level for the nearby residential homes on the east side of 280th St. West during groundwater recovery operations. The Agency proposes to equip these wells with insulated well enclosures that will reduce the operational noise level in the area to less than significant.

TRIBAL CULTURAL RESOURCES

TCR-1: Inadvertent Finds –

1. If human remains or funerary objects are encountered during any activities associated with the project, work in the immediate vicinity (within a 100-foot buffer of the find) shall cease and the County Coroner shall be contacted pursuant to State Health and Safety Code §7050.5 and that code enforced for the duration of the project.

2. In the event that Native American cultural resources are discovered during project activities, all work in the immediate vicinity of the find (within a 60-foot buffer) shall cease and a qualified archaeologist meeting Secretary of Interior (SOI) standards shall be hired to

assess the find. Work on the other portions of the project outside of the buffered area may continue during this assessment period. Additionally, San Manuel Band of Mission Indians will be contacted if any such find occurs and be provided information and permitted/invited to perform a site visit when the archaeologist makes his/her assessment, so as to provide Tribal input.

3. If significant Native American historical resources, as defined by CEQA (as amended, 2015), are discovered and avoidance cannot be ensured, an SOI-qualified archaeologist shall be retained to develop an cultural resources Treatment Plan, as well as a Discovery and Monitoring Plan, the drafts of which shall be provided to San Manuel Band of Mission Indians for review and comment.

    a. All in-field investigations, assessments, and/or data recovery enacted pursuant to the finalized Treatment Plan shall be monitored by a San Manuel Band of Mission Indians Tribal Participant(s).
    b. The Lead Agency and/or applicant shall, in good faith, consult with San Manuel Band of Mission Indians on the disposition and treatment of any artifacts or other cultural materials encountered during the project.

UTILITIES AND SERVICE SYSTEMS

UTIL-1: Electrical Service Upgrade Minimization Measures – In the event that the existing electrical grid system needs to be expanded to meet the proposed project demands, the Agency will require that the Electric Company comply with all mitigation measures identified in this Initial Study during the construction of the expansion.

RESOLUTION NO. R-21-18

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE ANTELOPE VALLEY-EAST KERN WATER AGENCY ADOPTING AN ADDENDUM TO THE MITIGATED NEGATIVE DECLARATION FOR THE HIGH DESERT WATER BANK PROJECT PURSUANT TO THE CALIFORNIA ENVIRONMENTAL QUALITY ACT, AND APPROVING MODIFICATIONS TO THE PROJECT

WHEREAS, the Antelope-Valley-East Kern Water Agency ("Agency"), acting as the lead agency, undertook to prepare, pursuant to the California Environmental Quality Act ("CEQA") (Public Resources Code Section 21000 *et seq.*), and the State's CEQA Guidelines (California Code of Regulations, Title 14, Section 15000, *et seq.*), environmental documentation for the whole of the High Desert Water Bank project ("Project"); and

WHEREAS, the Project consists of the development and operation of a groundwater bank within a 1,500 acre site located west of 280th Street West, East of 300th Street West, north of the California Aqueduct, and south of Avenue A (Los Angeles/Kern County line) near the community of Neenach in northern Los Angeles County. The Project's groundwater bank will have a capacity of approximately 280,000 acre feet for the storage of State Water Project water.

WHEREAS, a draft Mitigated Negative Declaration and Initial Study for the Project was made available to the public and all interested parties for review and comment by publishing a Notice of Intent to Adopt a Mitigated Negative Declaration, which was circulated for public review and comment from June 14, 2017 through July 13, 2017 in accordance with CEQA; and

WHEREAS, the Agency prepared a Final Mitigated Negative Declaration, which includes the draft Mitigated Negative Declaration documentation and a Mitigation Monitoring and Reporting Plan; and

WHEREAS, on December 19, 2017, the Agency's Board of Directors received and considered all comments on the Final Mitigated Negative Declaration and on the Project; and

WHEREAS, at such meeting the Board of Directors adopted Resolution No. R-17-25 to adopt the Mitigated Negative Declaration and approve the Project; and

WHEREAS, since the Board of Directors' adoption of Resolution No. R-17-25, the Project's design team has recommended several modifications to the Project, including changes to the number of recovery wells and the location of conservation lands, while maintaining the overall size of the Project's capacity; and

WHEREAS, the Agency has caused an Addendum to the Mitigated Negative Declaration ("Addendum"), a copy of which is attached as Exhibit A and incorporated herein by reference, to be prepared for the Project modifications in accord with CEQA Guideline Section 15164; and

WHEREAS, the Addendum need not be circulated for public review but is attached to the Mitigated Negative Declaration in accordance with CEQA Guideline Section 15164; and

WHEREAS, the Board of Directors has reviewed and considered the Addendum in conjunction with the Mitigated Negative Declaration; and

WHEREAS, the Board of Directors has reviewed the findings made in this Resolution and finds that they are based upon substantial evidence that has been presented to the Board in the record of the proceedings, including documents, staff reports, technical studies, plans, specifications, and other materials.

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of the Antelope Valley-East Kern Water Agency hereby resolves, orders, and determines as follows:

Section 1. The foregoing recitals are true and correct and constitute a material part of this Resolution.

Section 2. The Board of Directors has independently reviewed and considered the contents of the Addendum prior to deciding whether to approve the Project modifications. The Board of Directors finds, in its independent judgment after considering all relevant evidence in the record of proceedings for the Project, including the information set forth in the Addendum, that only minor technical changes and additions are necessary for the Mitigated Negative Declaration, and that none of the conditions requiring preparation of an environmental impact report or subsequent negative declaration have occurred.

Section 3. The Board of Directors hereby adopts the Addendum and approves the Project modifications as described in the Addendum subject to completion of further design documents and other engineering requirements for the Project.

Section 4. The custodian of the documents and other materials that constitute the record of proceedings on which action on the Project and the Addendum is based is Dwayne Chisam, General Manager of the Agency, and such documents are located at the Agency, at 6500 West Avenue N, Palmdale, California.

Section 5. The Board of Directors directs staff to file a Notice of Determination for the Addendum with the Los Angeles County Clerk.

Section 6. The President of the Board of Directors shall sign this Resolution and the Secretary of the Board of Directors shall attest and certify to the passage and adoption thereof.

ADOPTED this 26th day of October, 2021.

President of the Board of Directors of the
Antelope Valley-East Kern Water Agency

ATTEST:

Secretary of the Board of Directors of the
Antelope Valley-East Kern Water Agency

Print Form

1040

Notice of Determination

Appendix D

To:

☑ Office of Planning and Research

U.S. Mail:	*Street Address:*
P.O. Box 3044	1400 Tenth St., Rm 113
Sacramento, CA 95812-3044	Sacramento, CA 95814

☑ County Clerk
County of: Los Angeles
Address: 12400 Imperial Hwy
Norwalk, CA 90650

From:
Public Agency: Antelope Valley-East Kern Water Agency
Address: 6500 West Avenue N
Palmdale, CA 93551
Contact: Justin Livesay, Engineering Manager
Phone: 661-943-3201

Lead Agency (if differer
Address:
Contact:
Phone:

2021 269205
FILED
Dec 13 2021
Dean C. Logan, Registrar-Recorder/County Clerk
Electronically signed by MAXINE CARRASCO

SUBJECT: Filing of Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code.

State Clearinghouse Number (if submitted to State Clearinghouse): 2017061030

Project Title: High Desert Water Bank

Project Applicant: Antelope Valley-East Kern Water Agency

Project Location (include county): Los Angeles County

Project Description:
An addendum (Addendum 1) to the previously approved Mitigated Negative Declaration for the High Desert Water Bank project was prepared in accordance with CEQA guidelines to incorporate minor project changes which result in no additional impacts and no changes to the feasibility of implementation of previously identified mitigation actions for the project as previously adopted. Addendum 1 was considered in conjunction with the previously adopted Mitigated Negative Declaration and adopted by Resolution of the AVEK Board of Directors on October 26, 2021.

This is to advise that the Antelope Valley-East Kern Water Agency has approved the above
(☑ Lead Agency or ☐ Responsible Agency)

described project on October 26, 2021 and has made the following determinations regarding the above
(date)
described project.

1. The project [☐ will ☑ will not] have a significant effect on the environment.
2. ☐ An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA.
   ☑ A Negative Declaration was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation measures [☑ were ☐ were not] made a condition of the approval of the project.
4. A mitigation reporting or monitoring plan [☑ was ☐ was not] adopted for this project.
5. A statement of Overriding Considerations [☐ was ☑ was not] adopted for this project.
6. Findings [☑ were ☐ were not] made pursuant to the provisions of CEQA.

This is to certify that the final EIR with comments and responses and record of project approval, or the negative Declaration, is available to the General Public at:
Lead Agency's office located at 6500 West Avenue N, Palmdale, CA 93551

Signature (Public Agency): for Dwayne Chisam Title: General Manager

Date: November 5, 2021 Date Received for filing at OPR:

Authority cited: Sections 21083, Public Resources Code.
Reference Section 21000-21174, Public Resources Code.

Avek Water Agency
JAN 13 2022
Received

THIS NOTICE WAS POSTED
ON December 13 2021
UNTIL January 12 2022
REGISTRAR – RECORDER/COUNTY CLERK

INITIAL STUDY ADDENDUM 1
High Desert Water Bank

Prepared for:

Antelope Valley – East Kern Water Agency
6500 West Avenue N
Palmdale, CA 93351

Prepared by:

Compass Consulting Enterprises, Inc.
114 Marilla Ave, No. 3
Avalon, CA 90704

September 2021

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Appendix E Drainage Evaluation

1 INTRODUCTION

In December 2017 the Antelope Valley-East Kern Water Agency (the Agency) adopted a Mitigated Negative Declaration (MND, SCH Number 2017061030) for the High Desert Water Bank (Project or 2017 Original Project Design).

The Project involves the development and operation of a groundwater bank on approximately 1,500 acres of land in the western edges of the Antelope Valley. The project would store State Water Project (SWP) water supplies from the Agency and other banking participants during wet weather year periods when supplies exceed demands and would recover the water for use by the Agency and its partners during dry weather years when demands exceed supplies and other times when there are disruptions to State Water Project supplies. Implementation of this project will require the construction of monitoring and production water wells, turnout(s) from the California Aqueduct, East Branch, underground and above ground pipelines, recharge basins, and water storage and booster pump facilities.

Since the time of the MND adoption, two key events have occurred:

1. Although the overall number of acres and capacity have not changed, various components of the Project design have been optimized.

2. The CEQA Guidelines were revised in late 2019.

This Addendum document compiles the necessary information required to update the Agency's CEQA environmental review process for the Project in accordance with Sections 15162 and 15164 of the State CEQA Guidelines.

2 PROJECT DESCRIPTION

2.1 PROJECT LOCATION

The Agency proposes to build and operate a groundwater recharge and recovery program referenced as the High Desert Water Bank (the Project). The Project will be implemented on an approximately 1,500-acre site in Los Angeles County bounded by:

- Avenue A (Kern / Los Angeles County Line) on the north,
- 300th Street West on the west,
- 280th Street West on the east, and
- The California Aqueduct on the south.

This area is located in Sections 1, 2, 11, and 12 of Township 8 North, Range 17 West, northwest of the community of Neenach. Refer to Figures 2.4-1 and 2.4-2 for the Project location.

The Project area consists of undeveloped and fallowed agricultural land surrounded by the Tehachapi and San Gabriel mountain ranges to the north, south, and west. With the exception of some isolated residential homes within and to the east of the Project area, the nearest residential communities are located ½ mile south and east of the Project area. The Project's southern boundary is the California Aqueduct, East Branch which is a part of the backbone of the State of California's State Water Project (SWP). The California Aqueduct will be the source of water for recharge operations and the point of delivery for return flow operations for the Project. The Project area is also situated south of an existing groundwater bank owned and operated by the Tejon Ranch Corporation. The slope of the land generally falls to the east with an approximately 50-ft drop over a 2-mile section.

2.2 CAPACITY

2017 Original Project Design: Feasibility of the Project was evaluated by the Agency's consultant West Water Research LLC under the Financial Feasibility Assessment of Developing Enterprise Water Bank Capacity at the Far West Site dated March 2017. Based on this assessment, the Agency proposes the implementation of a 280,000-acre feet capacity groundwater bank that will store SWP water from various State Water Contractors and other partnering agencies throughout the State of California including the Agency. The Project proposes to store approximately 70,000 acre feet per year of SWP surface water conveyed to the site via the California Aqueduct, East Branch. Recharge operations are planned during wet weather years when SWP allocations exceed demands. The Agency then proposes to recover 90 percent of the stored water with up to an estimated 70,000 acre feet per year returned during dry and critical weather years when SWP allocations are low or disrupted. The Project would allow the Agency and its partners to rely primarily on the groundwater bank as augmentation source of water during dry weather years or during a disruption of normal water supplies.

2021 Revised Project Design: There is no change in the capacity from the 2017 Original Project Design.

2.3 FACILITIES AND OPERATIONS

In general, water from the SWP would be turned into the bank from an aqueduct turnout facility to be located in the southern portion of the site. The water would travel through a series of bidirectional

pipelines and pump station to the various recharge areas located throughout the bank property. Additionally, within the 1,500 acre area, 322 acres were set aside for habitat management.

Refer to Figure 2.4-3 for the original and proposed aqueduct turnout locations.

Refer to Figures 2.4-4 and 2.4-5 for the recharge, recovery and transmission facilities configuration assumed in the 2017 Original Project Design.

Refer to Figure 2.4-6 for the recharge, recovery and transmission facilities configuration assumed in the 2021 Project Design.

2.3.1 Aqueduct Turnout

2017 Original Project Design: The Agency proposed to construct one new 150 cubic feet per second (cfs) turnout off of the California Aqueduct just east of 300th Street West on the west end of the property, designed to operate via gravity flow, and rehabilitate the existing 50 cfs turnout located just east of 280th Street West, on the east end of the property, intended to be supplementary to the new turnout.

2021 Revised Project Design: Water for recharge operations will be conveyed from the California Aqueduct adjacent to the Project site and distributed to the recharge areas via one new 250 cubic feet per second (cfs) capacity turnout to be located just east of 290th Street West. The existing 50 CFS capacity turnout would not be rehabilitated.

2.3.2 Transmission Facilities

2017 Original Project Design: From the Aqueduct turnouts, water will be conveyed to the different recharge areas of the site with an approximately 3.5 mile combination / bi directional recharge and recovery transmission aboveground pipeline (Main) ranging in size from 36- inch to 70-inch in diameter, and approximately 9.5 miles of underground pipelines. This Main will be constructed with a number of aboveground turnouts that will serve as the point of connection to approximately 8 miles of temporary aboveground piping ranging in size from 12-inch to 48-inch in diameter. Aboveground piping would initially be installed throughout the initial berm construction area and then relocated throughout the remainder of the site as needed to deliver recharge water to the various low earthen berm recharge basins. The 3.5 miles of aboveground line would be required to be re-established after significant storm flow events from Oso Creek or Pescado Creek.

2021 Revised Project Design: From the Aqueduct turnout, water will be conveyed to the different areas of the site with an approximately 11.5 mile combination / bi directional recharge and recovery transmission underground pipeline (Main) ranging in size from 36- inch to 96-inch in diameter. This Main will be constructed with a series of lateral pipelines ranging from 24-inch to 48-inch in diameter that will convey water to various recharge basins throughout the project site. Water will be delivered to each recharge basin through a permanent turnout structure that will control and measure flows into each recharge basin.

2.3.3 Recharge Facilities

Recharge operations would occur when SWP water is available from the Agency and its partner's SWP allocations.

The Agency will work with DWR in order for this added flow to be delivered. In such a demand condition, DWR will need to have the Alamo Powerplant or the Cottonwood Chute Bypass in operation in order to balance the water demand in the aqueduct without exceeding the 2 ft per day aqueduct level drawdown criteria. The added demand condition will not be able to be met by DWR if either the Alamo Powerplant and or the Cottonwood Chutte Bypass are out of service. During operation of the bank, the Agency will submit daily water demand forecasts to DWR. The Agency will include provisions for DWR to have SCADA control over the turnout for monitoring and shutdown abilities.

2017 Original Project Design: Of the 1,500 acres, approximately 1,200 would be used for recharge, with an average of 400 acres utilized for inundation over 12 months in years when supply exceeds demand. The 400 acres of inundation would either be in various areas throughout the 1,200 acre property or in one larger area. The areas of inundation would vary annually as needed. The Agency proposed to construct low earthen berms (approximately 3 feet high) that will be placed on average at approximately 300 foot intervals throughout the site resulting in approximately 40 miles of berm construction. The 2017 MND identified that recharge would typically occur by spreading water over approximately 1,200 acres of the property by flooding, similar to flood irrigation agricultural operations where water is distributed throughout the recharging basins using shallow low earthen berms to slow the flow of water and therefore promote infiltration. Refer to Figures 2.4-4 and 2.4-5 for the original project design. Stormwater flooding events would be allowed to flow over the berms and therefore require the reconstruction of the berms after significant storms.

The proposed recharge operations of 70,000 acre feet per year were proposed for year round operations, at an assumed recharge infiltration rate of 0.5-foot per day.

2021 Revised Project Design: Of the 1,500 acres, approximately 890 acres would be used for recharge through a series of 42 engineered fill berms that are 6 feet high with concrete spillways located in the northern and southern portions of the bank property. Low, earthen berms would be located in the Pescado Creek floodway and along the southerly fringe of Oso Canyon floodway providing additional recharge capacity for the overall project. Recharge water from the SWP will be distributed into the recharge basins through a permanent network of underground conveyance systems. Each recharge basin will have local discharge control and flow metering in order to manage the overall recharging operational for the High Desert Water Bank. Some basin berms, such as those parallel to Avenue A-8, rip-rap will be used to protect constructed infrastructure from damage associated with the 100-year flood event.

The proposed recharge operations of 70,000 acre feet per year would operate over approximately nine months, an assuming a recharge infiltration rate of 0.50 foot per day.

During recharge operations, it is anticipated that a 100 cfs pump station will operate continuously.

2.3.4 Recovery Facilities

The Agency proposes to recover the groundwater year-round during dry weather years or at any other times when the Agency's groundwater banking participants call for water stored at the Project site to be recovered and delivered to the requesting partner.

2017 Original Project Design: Recovery would occur by the use of 18 new groundwater extraction wells designed at approximately 2,500 gallons per minute (gpm) each that will deliver the recovered water back to the California Aqueduct. During wet years with recharge operations, the power usage will be zero. During dry years with recovery operations, wells and pump station may be running continuously.

Operation of the bank would require one full time operator and assistant on site. The operator and assistant would travel daily with an assumed light duty (250 hp) pickup truck, 100 miles per day for operations. There would also be the need for additional staff to assist with berm construction and pipe relocations operations on a periodic basis. This crew is anticipated to travel in one light duty (250 hp) pickup truck with trailer, 100 miles per day, 5 days every four months.

2021 Revised Project Design: Recovery operations will be accomplished with the use of approximately 28 groundwater recovery wells designed with capacities ranging from approximately 1,800 to 2,200 gpm each delivering recovered water back to the California Aqueduct. During recovery operations, wells will be running continuously.

Operation of the bank would require one full time operator and assistant on site. The operator and assistant would travel daily with an assumed light duty (250 hp) pickup truck, 100 miles per day for operations.

2.3.5 Monitoring Wells

2017 Original Project Design: Currently, the site has about 10 existing wells that the Agency can utilize to monitor the groundwater level. The majority of these wells are inactive. The active wells would continue to operate under existing conditions. The Agency does not anticipate changing the use of these wells.

The Agency proposes to construct 5 new monitoring wells as part of the Project. These wells will be drilled approximately 500 feet deep and constructed with 5-inch well casing.

2021 Revised Project Design: There is no change to the monitoring well use or configuration, or number of new monitoring wells proposed to be drilled.

2.3.6 Booster Pump Station / Storage / Maintenance Facilities

2017 Original Project Design: The Agency proposed to construct a 150 CFS booster pump station and 250,000-gallon storage tank. The site will also house some maintenance facilities incorporated onto the new pump station building.

2021 Revised Project Design: The Agency proposes to construct a 100 CFS booster pump station only (no storage tank). The site will also house some maintenance facilities incorporated onto the pump station site. The proposed pump station will be designed to operate outdoors without any pump station building.

All electrical and controls will be located inside weather-resistant electrical cabinets under a new shade structure.

2.3.7 Conservation/Habitat Management

The Agency proposes to leave approximately 322 acres of the 1,500 acre Project site for habitat management/conservation purposes although no conservation easement or third-party management is proposed or required. The land set-aside was required in the 2017 MND to minimize potential impacts to biological resources including plant and wildlife species as well as wetlands and drainages.

2017 Original Project Design: Refer to Figure 2.4-7 for a map of the land proposed for habitat management with the 2017 Original Project Design.

2021 Revised Project Design: Refer to Figure 2.4-8 for a map of the land proposed for habitat management under the 2021 Revised Project Design. The location of the lands has been modified although the acreage remains the same.

Table 2.3-1: Design Comparison

Feature	2017 Original Project Design	2021 Revised Project Design
Capacity	280,000 AF groundwater Bank 70,000 AF/Yr Recharge/Recovery	No change
Aqueduct Turnout	1 new 150 cfs; rehab existing	1 new 250 cfs; no rehab of existing
Recharge Facilities	1,200 acres low earthen berms with 400 acres inundated annually, rotating throughout site; berms designed to be sacrificial during large storm events and reconstructed.	890 acres consisting of 42 engineered and flood-protected basins defined by engineered, compacted berms, with 890 acres available for use annually, with 890 acres anticipated to be inundated over eight months.
Recovery Facilities	18 (2,500 gpm each)	28 (1,800 to 2,200 gpm each)
Transmission Facilities	Above ground: 3.5 miles Below ground: 9.5 miles	Above ground: 0 Below ground: 11.5 miles
Monitoring Wells	5	No change
Pump Station and pump station building, storage tank	Included	Storage tank or Pump Station Building no longer required
Habitat Management Lands	322 Acres	No change to acreage; location change only

2.4 CONSTRUCTION

2.4.1 Overall Estimated Schedule

2017 Original Project Design: Construction is anticipated to be continuous for a period of approximately 2 years, beginning in January of Year 1 and ending in December of Year 2.

The 2017 MND identified the following estimated schedule:

2021 Revised Project Design: The construction will occur over approximately 2.5 calendar years, ending approximately December 2023. However, most of the site construction and development will occur over 21 months.

The estimated schedule for the 2021 Revised project Design is anticipated as follows:

Year	One (2021)				Two (2022)												Three (2023)											
Month	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Construction Activity																												
Aqueduct Turnout																												
Recovery Wells																												
Recharge Facilities Stage 1 (Basins, Pipelines)																												
Recharge Facilities Stage 2 (Basins, Pipelines)																												
Pump Station																												

2.4.2 Aqueduct Turnout

2017 Original Project Design: Construction for the new turnout will be located on the southwestern and southeastern boundary of the Project site and is anticipated to disturb about 6 acres of land. Construction operations will include installation of the turnout bay within the Aqueduct, underground piping, a metering building, and all associated electrical, mechanical, and instrumentation equipment. Earthwork for this phase of construction is estimated at 250 cubic yards with no import or export material anticipated. Construction operations are anticipated to last about 10 months.

2021 Revised Project Design: There is no change to the construction scenario for the new aqueduct turnout.

Table 2.4-1: Aqueduct Turnout Assumption Comparison

2017 Original Project Design	2021 Revised Project Design
1 crane (190 hp, 6 hours per day)	No change
1 hydraulic excavator (180 hp, 6 hours per day)	No change
1 backhoe (108 hp, 5 hours per day)	No change
1 roller compactor (114 hp, 4 hours per day)	No change
1 wheeled loader (165 hp, 6 hour per day)	No change
1 water truck (200 hp, 4 hours per day)	No change
Approx Total AC disturbance: **6 AC**	Approx Total AC disturbance: **No change**
Estimated Construct Time: 10 months	Estimated Construct Time: No change

Note: This table represents a reasonable assumption based on standard construction methods. Actual equipment and hours may vary depending on site conditions.

2.4.3 Transmission Facilities

2017 Original Project Design:

- Above ground pipelines: Installation of the aboveground piping would consist of the delivery of pipe to the site with a truck and deposited along the sides of the recharge basins for hand installation. Installation of this piping will be continuous as recharge operations are cycled from one area of the site to another.

- Below ground pipelines: The 9.5 miles of underground pipelines would be laid in a trench about 6 to 11 feet deep at the bottom (4-foot pipe cover), with side slopes of about 1.5 to 1 for trench safety and stability, or vertical sides if properly shored. Given an average bottom width of 6 feet, the width of the trench at ground level would not be more than about 20 feet. Excavation would involve removal of about 100 cubic feet of soil per linear foot of trench. A stockpile would be maintained along the pipeline alignment. Pipeline may be installed at a rate of about 400 feet per day. The daily work area would be approximately 500 feet long by 60 feet wide, although not all of this area would be disturbed continuously. Excess spoil from excavation operations may be used to provide a low exterior berm along the Project site or spread over the construction area and thus will not be hauled off site. Earthwork for this phase of construction is estimated at 1,200 cubic yards. Pipeline installation operations are estimated to take place over a period of about 7 months.

2021 Revised Project Design:

- Above ground pipelines: There are no above ground pipelines.

- Below ground pipelines: The 11.5 miles of underground pipelines would be laid in a trench about 6 to 12 feet deep at the bottom (4-foot pipe cover), with side slopes of about 1.5 to 1 for trench safety and stability, or vertical sides if properly shored. Given an average bottom width of 6 feet, the width of the trench at ground level would not be more than about 20 feet. Excavation would involve removal of about 100 cubic feet of soil per linear foot of trench. A stockpile would be maintained along the pipeline alignment. Pipeline may be installed at a rate of about 400 feet per

day. The daily work area would be approximately 500 feet long by 60 feet wide, although not all of this area would be disturbed continuously. Excess spoil from excavation operations will incorporated into the recharge basin berms and thus will not be hauled off site. Earthwork for this phase of construction is estimated at 351,000 cubic yards. Pipeline installation operations are estimated to take place over a period of about 12 months.

Table 2.4-2: Transmission :Facility Construction Assumption Comparison

2017 Original Project Design	2021 Revised Project Design
1 crane (190 hp, 2 hours per day)	2 cranes (190 hp, 2 hours per day)
1 hydraulic excavator (180 hp, 6 hours per day)	2 hydraulic excavators (180 hp, 6 hours per day)
1 grader (174 hp, 6 hours per day)	2 graders (174 hp, 6 hours per day)
1 off-highway truck (479 hp, 4 hours per day)	1 off-highway truck (479 hp, 4 hours per day)
2 water trucks (200 hp, 4 hours per day)	2 water trucks (200 hp, 4 hours per day)
1 belly scraper (313 hp, 4 hours per day)	3 belly scrapers (313 hp, 4 hours per day)
2 wheeled loaders (165 hp, 8 hours per day)	2 wheeled loaders (165 hp, 8 hours per day)
1 skip loader (88 hp, 3 hours per day)	1 skip loader (88 hp, 3 hours per day)
2 backhoes (108 hp, 5 hours per day)	4 backhoes (108 hp, 5 hours per day)
Approx Total Acres disturbance: 9.5 miles x 20 ft wide = **23 AC** Estimated Construct Time: 10 months	Approx Total Acres disturbance: 11.5 miles x 20 ft wide = **27 AC** Estimated Construct Time: 12

Note: This table represents a reasonable assumption based on standard construction methods. Actual equipment and hours may vary depending on site conditions.

2.4.4 Recharge Facilities

2017 Original Project Design: The Agency proposed to construct low earthen berms that would be placed on average at approximately 300-foot intervals throughout the site resulting in approximately 40 miles of berm construction. The total area disturbed would be at maximum about 1,200 acres. The Agency would initially construct about 400 acres of recharge basins with work expected to last about 4 weeks. After the initial construction is complete, the remainder of recharge basin construction will be continuous as recharge operations are cycled throughout the site. Construction operations for these basins would mainly consist of pushing dirt with a tractor or backhoe to create the low earthen berms along the existing contour lines and are typical to agricultural operations. Berms will not be large enough to drive on. To keep dust down, native plants will be allowed to propagate in and around the basins and berms. This vegetation will minimize dust potential. During recharge operations, the soil will be wet. During non-recharge operations, the conditions are no different than they are now (fallowed undeveloped land).

2021 Revised Project Design: The Agency proposed to construct 42 earthen berms with an average height of 6 feet high. The total area disturbed would be at maximum about 890 acres. The Agency would initially construct about 400 acres of recharge basins within the southerly portion of the project site with work expected to last about 18 weeks. After the initial construction is complete, the remainder of recharge basin construction will be continuous until all the remaining basins and control structures are completed. Construction operations for these basins would mainly consist of excavating and constructing engineered berms along existing contour lines forming the recharge basin complex. Berms will be suitable for maintenance vehicle access. To keep dust down, native plants will be allowed to propagate in and around

the basins and berms. This vegetation will minimize dust potential. During recharge operations, the soil will be wet. During non-recharge operations, the conditions are no different than they are now (fallowed undeveloped land).

Table 2.4-3: Recharge Facility Construction Assumption Comparison

2017 Original Project Design	2021 Revised Project Design
2 backhoes (108 hp, 5 hours per day)	2 backhoes (108 hp, 5 hours per day)
	1 hydraulic excavator (180 hp, 6 hours per day)
	2 graders (174 hp, 6 hours per day)
	2 off-highway truck (479 hp, 4 hours per day)
	2 water trucks (200 hp, 4 hours per day)
	6 belly scrapers (313 hp, 6 hours per day)
	2 wheeled loaders (165 hp, 6 hours per day)
	2 skip loaders (88 hp, 3 hours per day)
Approx Total Acres disturbance: **1,200 AC** Estimated Construct Time: 10 months Initial 6 months continuously to re-establish as needed	Approx Total Acres disturbance: **890 AC** Estimated Construct Time: 12 months Initial

Note: This table represents a reasonable assumption based on standard construction methods. Actual equipment and hours may vary depending on site conditions.

2.4.5 Recovery/Extraction Facilities

2017 Original Project Design: For the 18 extraction wells to be drilled to approximately 500 feet, construction would include grading to level a 100 by 100-foot drilling pad area, well drilling and construction, well site fencing, overflow basins, well piping, well equipment installation including the pump, motors, and all associated electrical, mechanical, and instrumentation equipment. A typical 16-inch well may yield about 90 cubic yards of drilling spoil, which will be spread on site over an area of about 0.05 acre. Well facilities would be operated with electrical power and would not emit criteria pollutants.

2021 Revised Project Design: For the 28 extraction wells to be drilled ranging from 600 feet to 1,200 feet, construction would be the same as previously identified.

Table 2.4-4: Recovery Facilities Construction Assumption Comparison

2017 Original Project Design	2021 Revised Project Design
1 drilling rig (500 HP, 24 hrs per day for 90 days)	2 drilling rigs (500 HP, 24 hrs per day for 90 days)
1 hydraulic excavator (180 hp, 6 hours per day)	2 hydraulic excavators (180 hp, 6 hours per day)
1 grader (174 hp, 6 hours per day)	2 off-highway trucks (479 hp, 4 hours per day)
1 off-highway truck (479 hp, 4 hours per day)	2 wheeled loaders (313 hp; 1 hour per day)
1 small roller compactor (114 hp, 1 hour per day)	1 water truck (200 hp, 1 hour per day)
1 skip loader (88 hp, 1 hour per day)	2 Test pumps (200 hp, 60 hrs per well)
1 wheeled loader (313 hp; 1 hour per day)	2 skip loaders (88 hp, 1 hour per day)
1 water truck (200 hp, 1 hour per day)	2 small roller compactors (114 hp, 1 hour per day)
Test pump (200 hp, 60 hrs per well)	2 graders (174 hp, 6 hours per day)
Approx Total Acres disturbance: 100 x 100 pad x 18 pads = **4.13 AC**	Approx Total Acres disturbance: 100 x 100 pad x 28 pads = **6.5 AC**
Estimated Construct Time: 12 months	Estimated Construct Time: 30 months

Note: This table represents a reasonable assumption based on standard construction methods. Actual equipment and hours may vary depending on site conditions.

2.4.6 Monitoring Wells

2017 Original Project Design: The Agency proposed to construct 5 monitoring wells, approximately 500 feet deep with 5-inch well casing. Work for these wells is anticipated to take about 12 weeks. Construction operations include grading to level a 40 x 40-foot drilling pad area, a standard drilling rig on site, a sand-bagged area to receive drilling spoil and reduce runoff, and grading equipment to spread the wet drilling spoil. A typical well may yield about 10 cubic yards of drilling spoil, which will be spread on site over an area of about 0.02 acre. After completion, these wells will be sampled and tested to determine local groundwater quality and the specific yield of the well.

2021 Revised Project Design: There is no change in the number or size of wells, construction methods or timing.

Table 2.4-5: Monitoring Well Construction Assumption Comparison

2017 Original Project Design	2021 Revised Project Design
1 drilling rig (500 HP, 8 hrs per day for 20 days)	No change
1 small roller compactor (114 hp, 1 hour per day)	No change
1 skip loader (88 hp, 1 hour per day)	No change
1 wheeled loader (313 hp; 1 hour per day)	No change
1 water truck (200 hp, 1 hour per day)	No change
Test pump (10 hp, 12 hrs per well)	No change
Approx Total Acres disturbance: 0.02 AC each x 5 wells = **0.1 AC** Estimated Construct Time: 3 months	Approx Total Acres disturbance: **No change** Estimated Construct Time: No Change

Note: This table represents a reasonable assumption based on standard construction methods. Actual equipment and hours may vary depending on site conditions.

2.4.7 Booster Pump Station / Storage / Maintenance Facilities

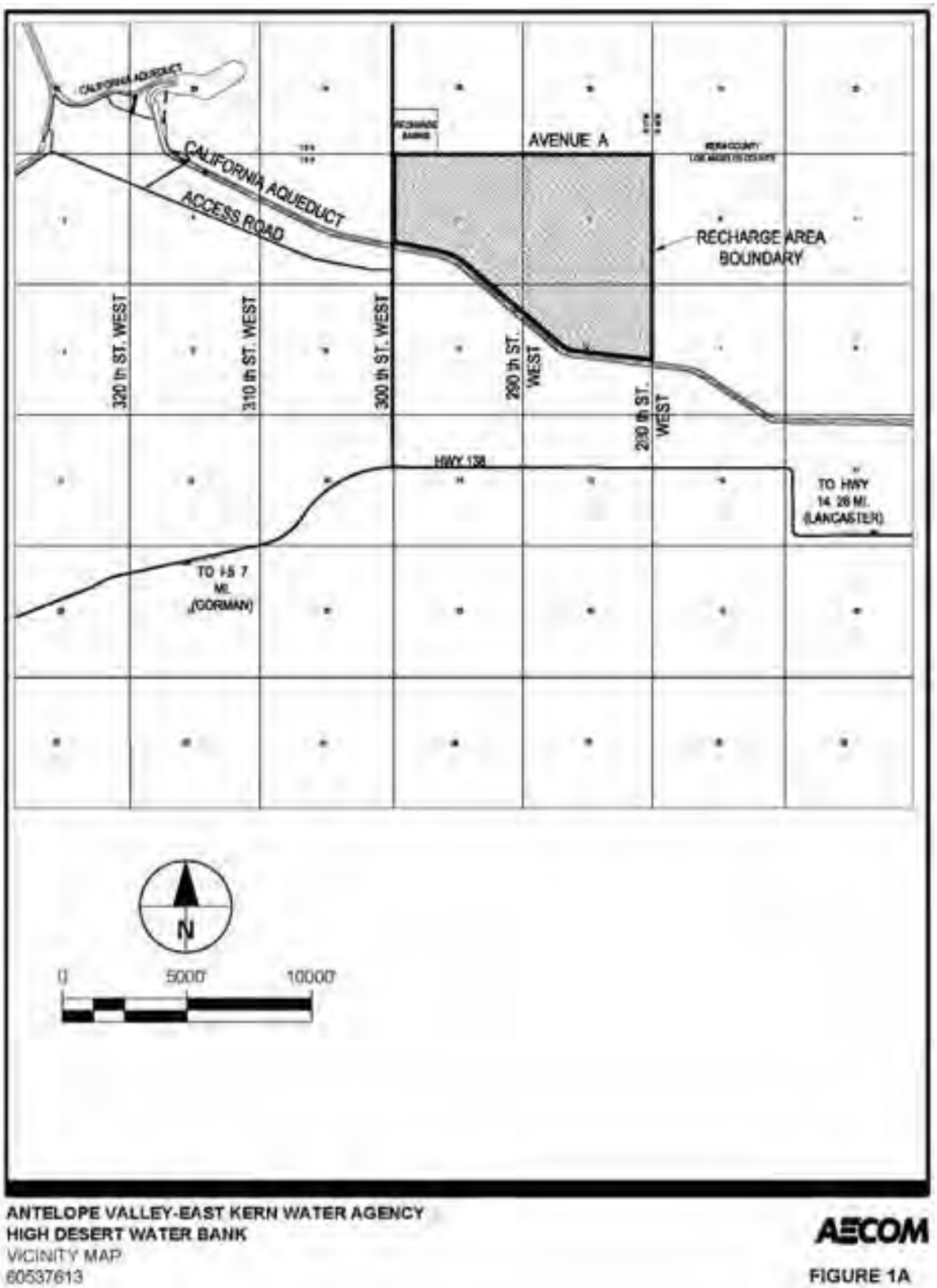
2017 Original Project Design: A booster pump station, maintenance building and storage tank would be built on about a 2-acre site adjacent to the California Aqueduct with gravel parking pads. Construction work would consist of initial site grading and earthwork, piping installation, concrete foundation work, building construction including mechanical, electrical, plumbing, and instrumentation, and installation of the storage tank. Booster pump facilities would be operated with electrical power and would not emit criteria pollutants. The storage tank was proposed to be between 24 and 32 feet high. Construction are anticipated to take about 12 months.

2021 Revised Project Design: The booster pump and maintenance facilities will be built near the center of the project site. All aspects are the same as the 2017 Original Project Design, except that the storage tank would not be constructed.

Table 2.4-6: Booster Pump Station/Storage/Maintenance Construction Assumption Comparison

2017 Original Project Design	2021 Revised Project Design
1 crane (190 hp, 6 hours per day)	No Change
1 hydraulic excavator (180 hp, 6 hours per day)	No Change
1 grader (174 hp, 6 hours per day)	No Change
1 off-highway truck (479 hp, 4 hours per day)	No Change
1 water truck (200 hp, 4 hours per day)	No Change
1 belly scraper (313 hp, 4 hours per day)	No Change
1 wheeled loader (165 hp, 8 hours per day)	No Change
1 roller (114 hp, 3 hours per day)	No Change
2 backhoes (108 hp, 5 hours per day)	No Change
1 skip loader (88 hp, 1 hour per day)	No Change
Welder (25 hp, 8 hours per day)	No Change
Air compressor for sandblasting and coating (25 hp, 8 hours per day)	No Change
Approx Total AC disturbance: **2 AC** Estimated Construct Time: 3 months	Approx Total AC disturbance: **No Change** Estimated Construct Time: No Change

Note: This table represents a reasonable assumption based on standard construction methods. Actual equipment and hours may vary depending on site conditions.



ANTELOPE VALLEY-EAST KERN WATER AGENCY
HIGH DESERT WATER BANK
VICINITY MAP
60537613

AECOM

FIGURE 1A

Figure 2.4-1: Site Location - Schematic

ANTELOPE VALLEY-EAST KERN WATER AGENCY
HIGH DESERT WATER BANK
AERIAL VICINITY MAP
60537613

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FIGURE 1B

Figure 2.4-2: Site Location - Aerial
Initial Study Addendum 1
High Desert Water Bank

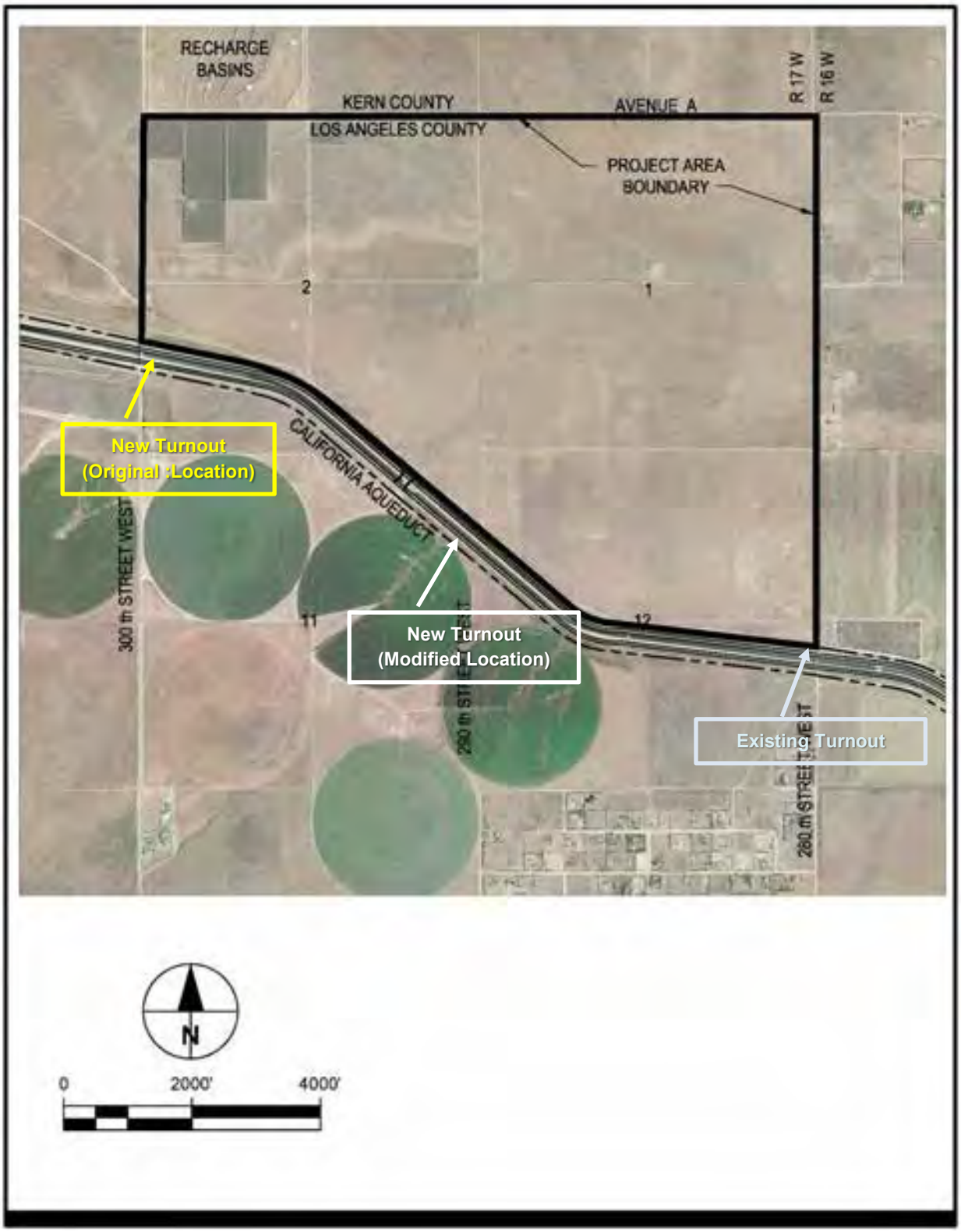

Figure 2.4-3: Aqueduct Locations
Initial Study Addendum 1
High Desert Water Bank

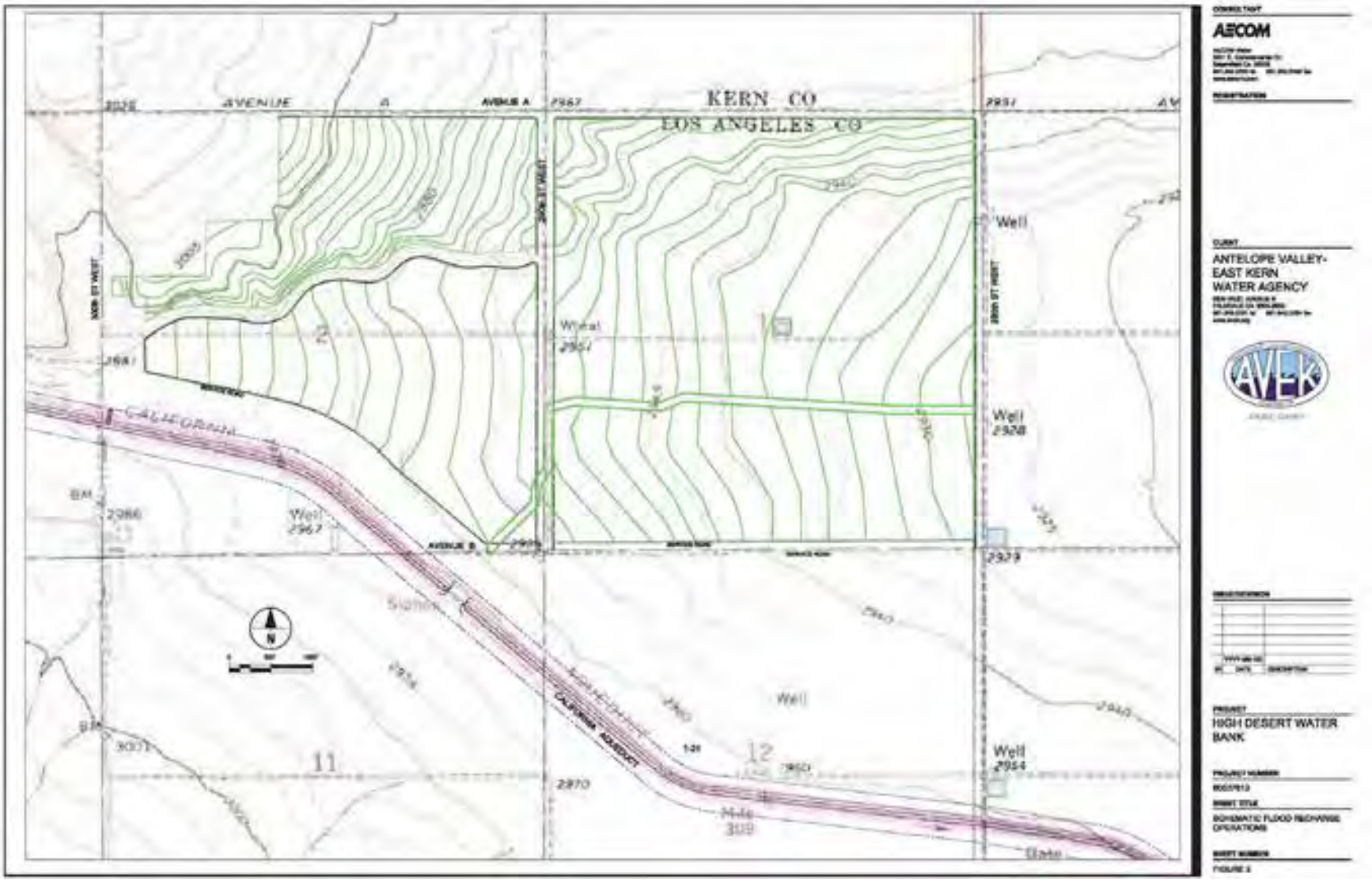

Figure 2.4-4: Recharge Area – 2017 Original Design
Initial Study Addendum 1
High Desert Water Bank

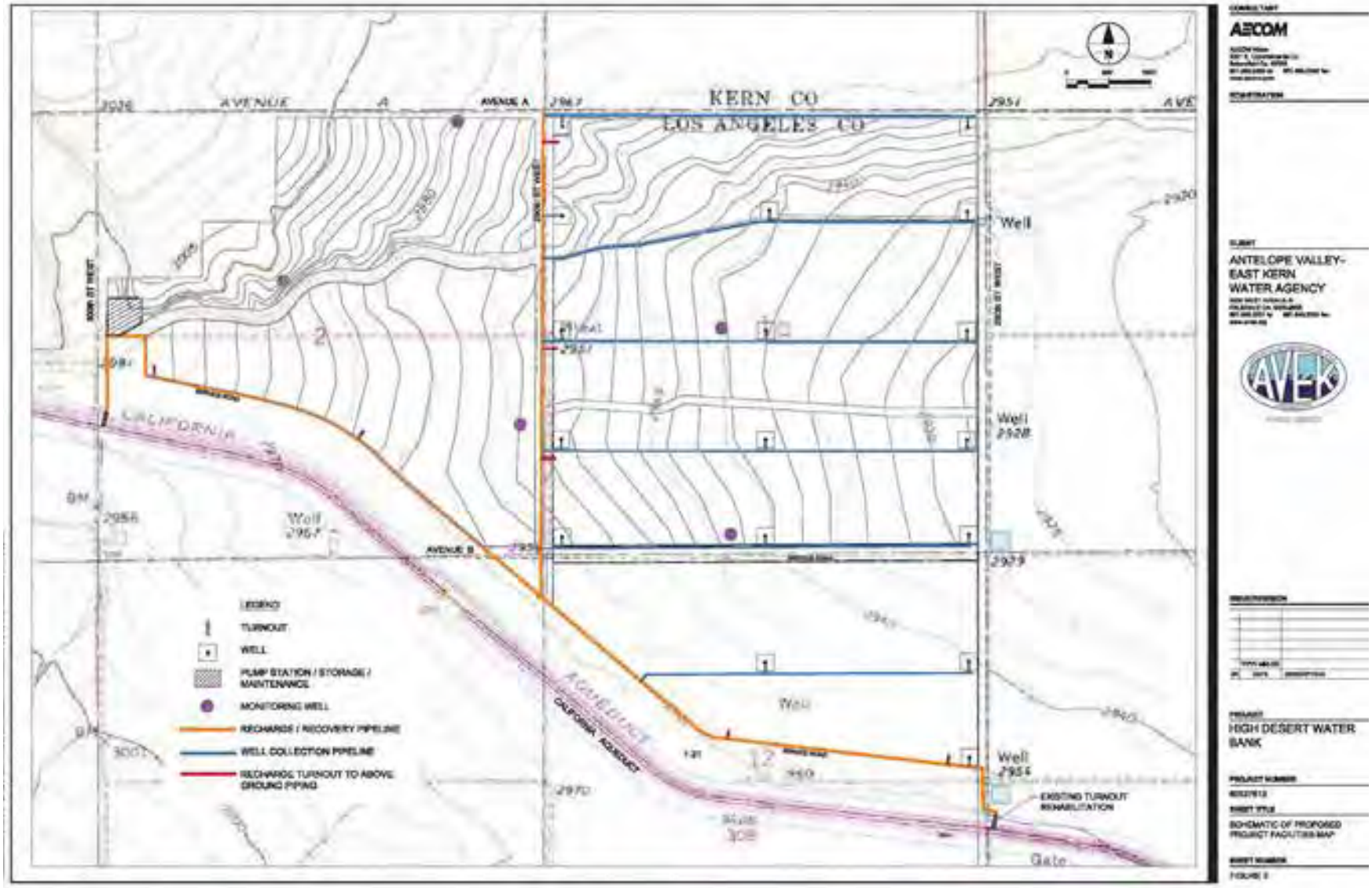

Figure 2.4-5: Recharge Facilities – 2017 Original Design
Initial Study Addendum 1
High Desert Water Bank

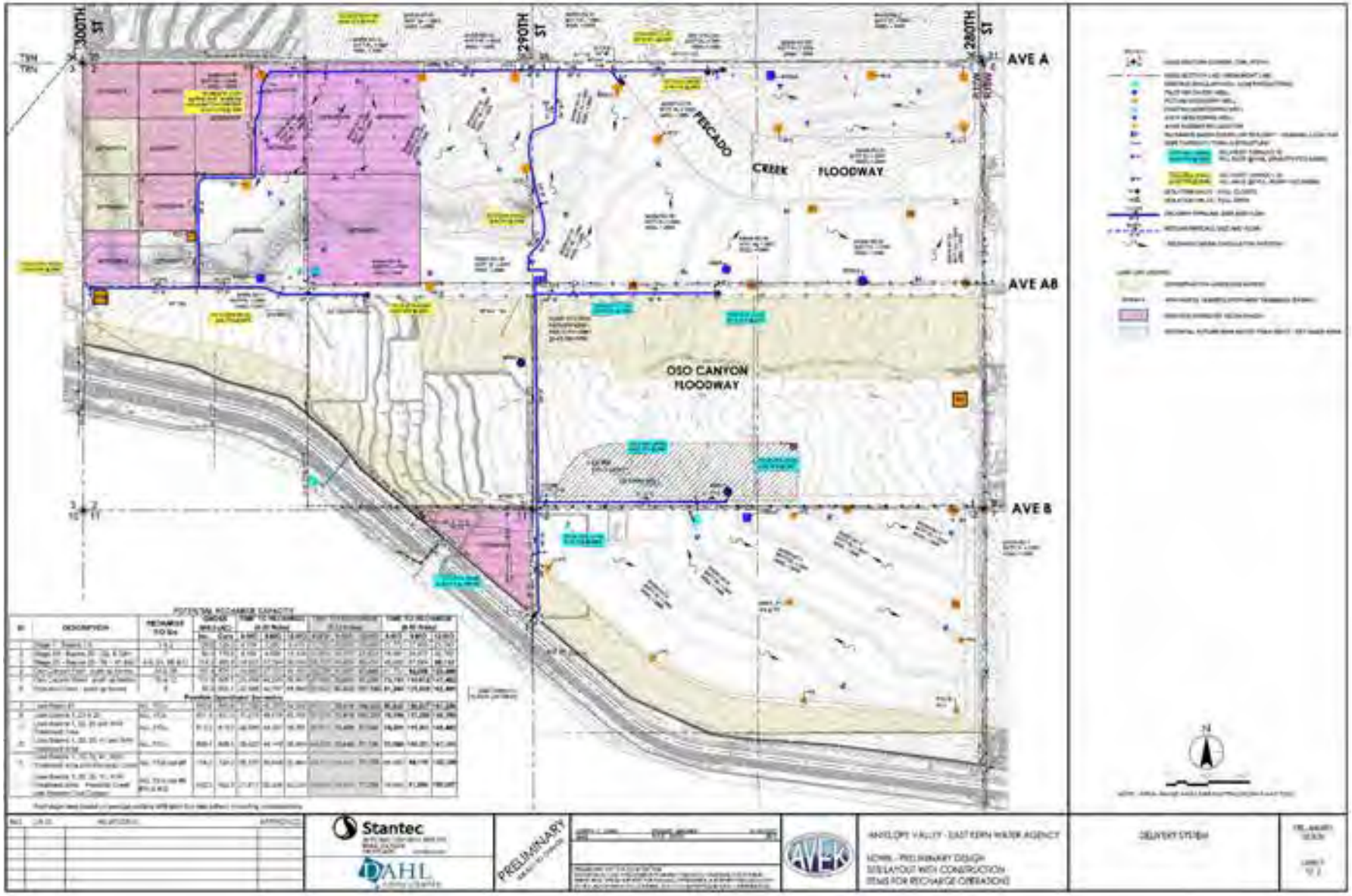

Figure 2.4-6: Recharge Facilities – 2021 Revised Design

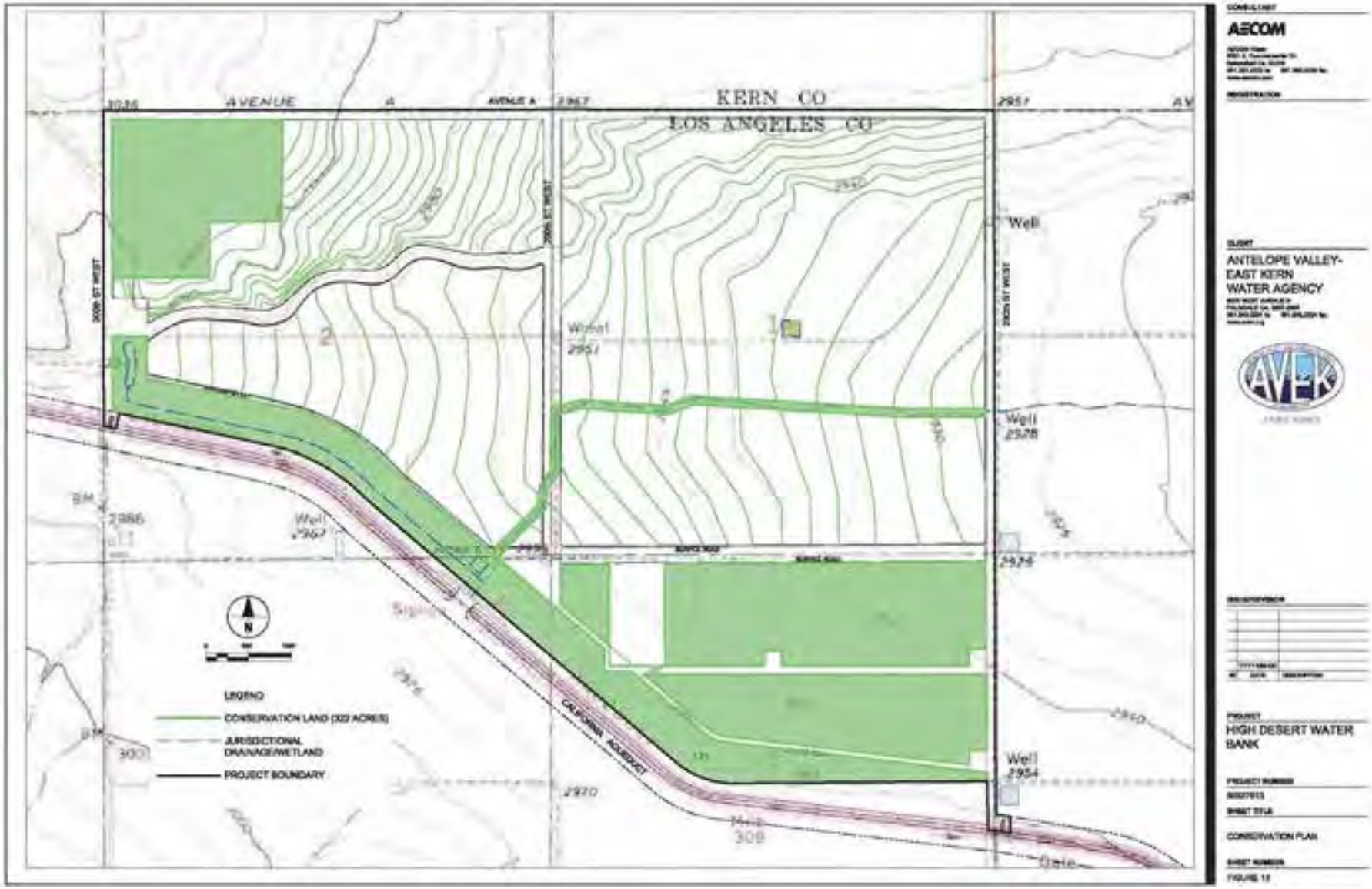

Figure 2.4-7: Habitat Lands – 2017 Original Design
Initial Study Addendum 1
High Desert Water Bank

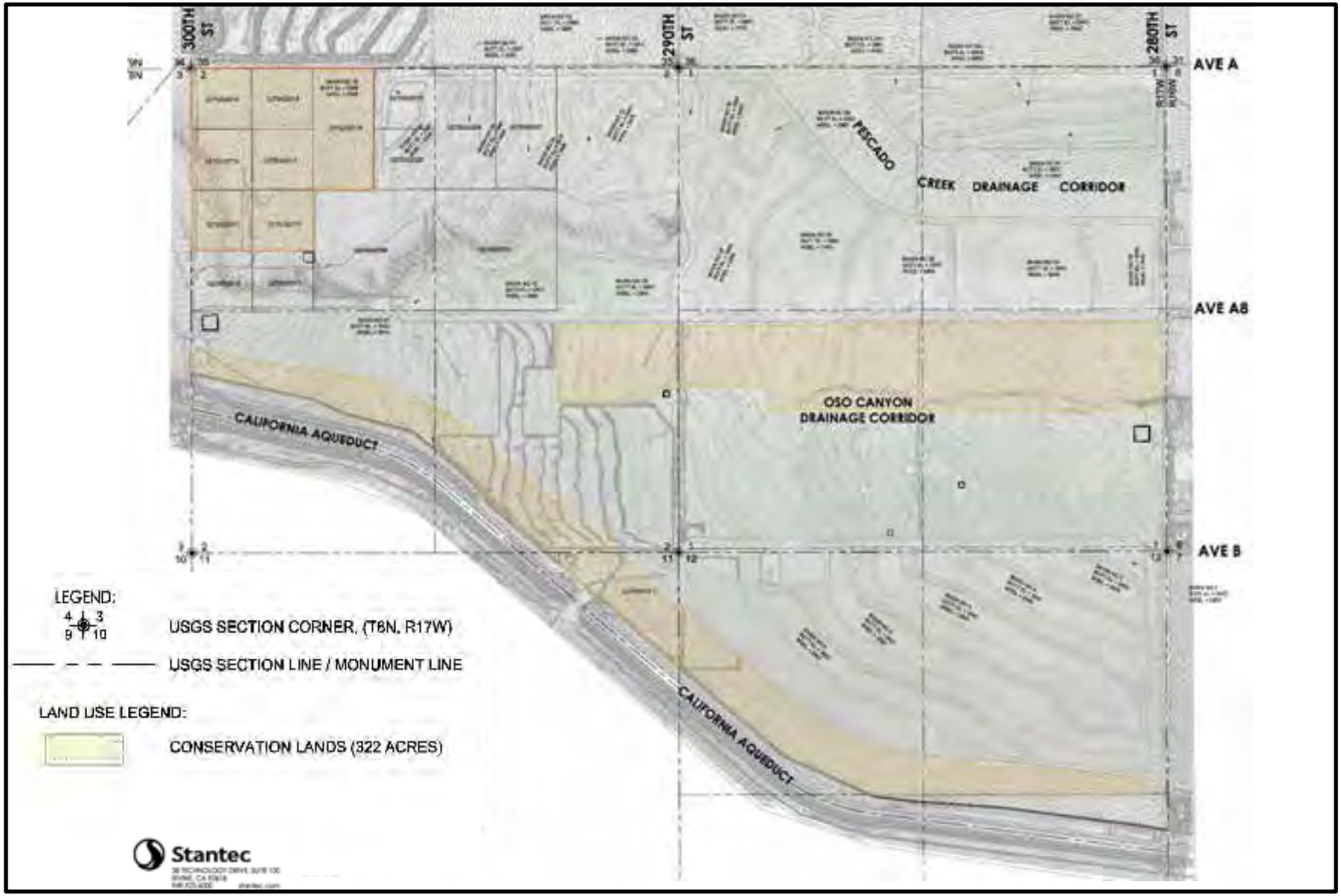

Figure 2.4-8: Habitat Lands – 2021 Revised Design
Initial Study Addendum 1
High Desert Water Bank

3 ENVIRONMENTAL REVIEW PROCESS

3.1 SUMMARY OF PROJECT REVISIONS

A comparison of the 2017 Project Design and the 2021 Project Design is provided in Table 2.3-1. Based on the design changes and construction, the key considerations for environmental review include:

- Only 890 acres of land would be disturbed, instead of 1,200 acres as with the original design.

- A series of 42 basins defined by engineered, compacted berms would be constructed, with spillways to direct flow into each of the basins. Some of the dry sides of the basin walls would be reinforced with rip rap as needed to protect from storm flows. The former design would have constructed low (3-foot-high) berms throughout the 1,200 acres designed to be destroyed during storm events and reconstructed after storm events.

- Inundation/recharge would occur within each of the 42 basins simultaneously (890 acres), or in as many basins are needed to store the excess supply. The original design would have provided for inundation/recharge in 400 acres for 12 months, rotating the areas of inundation as needed over the 1,200 acres.

- All pipelines would be underground, instead of a combination of underground and above ground. Overall the length of the pipelines are approximately the same at approximately 11.5 miles of pipeline. The locations of the pipelines have also changed dur to the design change.

- The number of recovery/extraction wells increased from 18 to 28.

- The number of recovery/extraction wells increased from 18 to 28, although the recovery rate/power of all the new wells would be reduced from approximately 2,500 gpm to approximately 1,800 to 2,200 gpm. And while the overall power consumption would be greater, the infrastructure that would be necessary to provide power under the original design is the same as what would be required for the revised design.

- The areas set aside for habitat management has changed, but the acres did not change. The areas for habitat management now primarily consist of the area within the Oso Canyon floodway and a strip of land adjacent to the Aqueduct, and a small area in the northwestern portion of the site. The habitat management set aside area in the northwestern portion of the site, which consisted of fallow orchards, has been reduced. The habitat management set aside area in the southeastern portion of the site has been removed, and now will be used for recharge basins. In the original Project design, the area in the southeastern portion of the site would have also been developed with soft berms and used in the inundation rotation cycle.

Table 3.1-1: Design Comparison

Feature	2017 Original Project Design	2021 Revised Project Design
Capacity	280,000 AF GW Bank 70,000 AF/Yr Storage/Recharge	No change
Aqueduct Turnout	1 new 150 cfs; rehab existing	1 new 250 cfs; no rehab of existing
Recharge Facilities	1,200 acres soft berms with 400 acres inundated annually, rotating throughout site; berms designed to removed during large storm events and reconstructed.	890 acres with water recharge contained within 42 engineered and protected basins defined by engineered, compacted berms, with 890 acres available for use annually.
Recovery Facilities	18 (2,500 gpm each)	28 (1,800 to 2,200 gpm each)
Transmission Facilities	Above ground: 3.5 miles Below ground: 9.5 miles	Above ground: 0 Below ground: 11.5 miles
Monitoring Wells	5	No change
Pump Station, water tank, maintenance	Included	Storage tank or Pump Station Building no longer required
Habitat Management Lands	322 Acres	No change to acreage; location change only

3.2 REGULATORY FRAMEWORK

In December 2017 the Agency adopted a Mitigated Negative Declaration (2017 MND, SCH Number 2017061030) for the High Desert Water Bank Project (Project). Based on the 2021 Project Design, the Agency is required to reassess potential impacts and determine if the Project revisions require an Amendment or an Addendum to the 2017 MND.

3.2.1 Initial Study/MND Amendment

CEQA Guidelines Section 15162 states that when a negative declaration has been adopted for a project, no subsequent negative declaration shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in the light of the whole record, one or more of the following:

> *(1) Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;*
>
> *(2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or Negative Declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or*
>
> *(3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the Negative Declaration was adopted, shows any of the following:*
>
> > *(A) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;*

(B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;

(C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

(D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

The guidelines further state that if changes to a project or its circumstances occur or new information becomes available after adoption of a negative declaration, the lead agency shall prepare a subsequent negative declaration if required under subdivision (a). Otherwise the lead agency shall determine whether to prepare a subsequent negative declaration, an addendum, or no further documentation.

3.2.2 Initial Study/MND Addendum

CEQA Guidelines Section 15164 sets out the conditions in which an adopted MND can be revised or amended:

(a) The lead agency or a responsible agency shall prepare an addendum to a previously certified EIR if some changes or additions are necessary but none of the conditions described in Section 15162 calling for preparation of a subsequent EIR have occurred.

(b) An addendum to an adopted negative declaration may be prepared if only minor technical changes or additions are necessary or none of the conditions described in Section 15162 calling for the preparation of a subsequent EIR or negative declaration have occurred.

(c) An addendum need not be circulated for public review but can be included in or attached to the final EIR or adopted negative declaration.

(d) The decision-making body shall consider the addendum with the final EIR or adopted negative declaration prior to making a decision on the project.

(e) A brief explanation of the decision not to prepare a subsequent EIR pursuant to Section 15162 should be included in an addendum to an EIR, the lead agency's required findings on the project, or elsewhere in the record. The explanation must be supported by substantial evidence.

3.3 INITIAL STUDY CHECKLIST

The 2017 CEQA Guidelines were used to analyze the 2017 Original Project Design, and an MND was adopted (2017 MND). Since that time, the California Natural Resources Agency (the "Natural Resources Agency") amended the CEQA Guidelines effective in 2018 and 2019.

The amendments addressed legislative changes to the California Environmental Quality Act (CEQA), clarified certain portions of the existing CEQA Guidelines, and updated the CEQA Guidelines to be consistent with recent court decisions.

The following changes to the 2019 CEQA Guidelines include:

- Added sections: 15064.3 (transportation) and 15234 (remand procedures).
- Amended sections: 15004, 15051, 15061, 15062, 15063, 15064, 15064.4, 15064.7, 15072, 15075, 15082, 15086, 15087, 15088, 15094, 15107, 15124, 15125, 15126.2, 15126.4, 15152, 15155, 15168, 15182, 15222, 15269, 15301, 15357, 15370, and Appendix G, Appendix M and Appendix N.

As a result of the revised Guidelines, the CEQA Checklist, located in Appendix G of the Guidelines and used to analyze Project impacts, was revised. Many checklist sections underwent minor modifications and clarifications to incorporate the revised CEQA statute revisions. However, two new checklist sections were added – "Energy" and "Wildfire" – in 2019.

Another legislative change that occurred was with respect to Traffic/Transportation. Section 15064.3 of the CEQA Guidelines was added to switch from Level of Service (LOS) to Vehicle Miles Traveled (VMT) as metric for transportation impact analysis. Los Angeles County's July 2020 Traffic Impact Study Guidelines, identify that the VMT analysis should be consistent with the CEQA Guidelines in that the VMT analysis applies only to "development projects."

The CEQA Guidelines have been amended since 2019, with the current version being the 2021 Guidelines, but there have been no substantive revisions that impact a project analysis.

Pursuant to Public Resources Code Section 21166, and CEQA Guidelines Sections 15162 and 15164, subd. (a), the attached Initial Study Checklist has been prepared to evaluate the 2021 Revised Project Design. The attached Initial Study Checklist uses the standard environmental checklist categories provided in Appendix G of the CEQA Guidelines, but provides response columns for evaluation consistent with the considerations listed under CEQA Guidelines Section 15162, subd. (a).

3.4 MITIGATION MONITORING AND REPORTING PROGRAM

The 2017 MND included a Mitigation Monitoring and Reporting Program (MMRP) that identified mitigation measures, timing and compliance requirements that would reduce impacts to less than significant. The MMRP adopted is included in Appendix A. The Mitigation Measures are summarized in Table 3.4-1.

The attached Initial Study also evaluated the existing mitigation measures to determine if the 2021 Revised Project Design would require clarification of, or additional, mitigation measures as identified in the 2017 MND.

Table 3.4-1: Mitigation Measure Summary

Topic Area	MM Number	Summary Description
General	Pre Construction Training	Determine the need for a pre-construction training program
Ag Resources	AG-1	Prime Farmland Avoidance.
Air Resources	AQ-1	Minimization Measure for NOx Related Emissions
Biological Resources	BIO-1	Burrowing Owls (Pre-Construction Surveys)
Biological Resources	BIO-2	Desert Kit Fox and American Badger (Pre-Construction Surveys)
Biological Resources	BIO-3	Nesting Birds (Pre-Construction Surveys)
Biological Resources	BIO-4	Animal Movement and Entrapment (Trenches)
Biological Resources	BIO-5	Animal Movement and Entrapment (Pipes)
Biological Resources	BIO-6	Erosion and Sediment Control
Biological Resources	BIO-7	Special-Status Plants
Biological Resources	BIO-8	Swainson's Hawk (focused surveys prior to recharge basin construction)
Biological Resources	BIO-9	Tri-colored Blackbirds (focused surveys prior to recharge basin construction)
Biological Resources	BIO-10	Jurisdictional Drainages and Wetlands and Permitting (prior to recharge basin construction)
Biological Resources	BIO-11	Habitat Mitigation (prepare Habitat Mitigation Management Program)
Biological Resources	BIO-12	General (construction crew training, site and staging guidelines)
Cultural Resources	CR-1	Cultural Resources Monitoring (develop a Cultural Resources Monitoring and Mitigation Plan prior to start of ground disturbance)
Cultural Resources	CR-2	Regulation Compliance (accidental discovery of human remains)
Geology and Soils	GEO-1	Stormwater Pollution Prevention Plan (SWPPP)
Geology and Soils	GEO-2	Seismic Design
Geology and Soils	GEO-3	Pipeline Shut Off Valves
Geology and Soils	GEO-4	Groundwater Monitoring Plan
Hazards and Haz Materials	HAZ-1	Spill Prevention Plan
Hazards and Haz Materials	HAZ-2	Bird Strike Hazard Notification
Hazards and Haz Materials	HAZ-3	Bird Strike Hazard Minimization Measures
Hazards and Haz Materials	HAZ-4	Mosquito Borne Disease Minimization Measures
Hydrology and Water Quality	HWQ-1	Drainage Design (Construct recharge areas so that they will not divert sheet flooding and other runoff away from the recharge areas)
Hydrology and Water Quality	HWQ-2	Stormwater Pollution Prevention Plan (SWPPP)
Hydrology and Water Quality	HWQ-3	Spill Prevention Plan
Hydrology and Water Quality	HWQ-4	Protection of Off Site Wells
Hydrology and Water Quality	HWQ-5	Management of Herbicides and Pesticides

Topic Area	MM Number	Summary Description
Noise	NOISE-1	Construction Noise Monitoring and Minimization Measures (near and along 280th Street West)
Noise	NOISE-2	Operation Noise Minimization Measures (near and along 280th Street West)
Tribal Cultural Resources	TCR-1	Inadvertent Finds
Utilities	UTIL-1	Electrical Service Upgrade Minimization Measures (expansion of grid for Project)

3.5 ENVIRONMENTAL ANALYSIS CONCLUSION

The IS/MND for the 2017 Original Project Design was prepared utilizing the 2017 CEQA Appendix G Checklist.

This Addendum will assess the 2021 Revised Project Design using the 2021 CEQA Guidelines for criteria. Additionally, assessments for the new CEQA Checklist sections for Energy and Wildfire are added for completeness.

The following Environmental Subject Areas require no further analysis and are not addressed in this Addendum because: 1) there were either no or non-substantive revisions to the Guidelines in these sections; 2) the nature of the evaluation criteria applies broadly to the Project area which has not changed irrespective of the changes to the Project design; and 3) the 2017 MND identified either no impact or less than significant impact and no mitigation measures in the subject areas:

I. Aesthetics

XI. Land Use and Planning

XII. Mineral Resources

XIV. Population and Housing

XV. Public Services

XVI. Recreation

This Addendum, checklist, and attached documents constitute substantial evidence supporting the conclusion that preparation of a supplemental or subsequent EIR or ND is not required because none of the conditions described in CEQA Guidelines Section 15162 (Subsequent EIRs and Negative Declarations) calling for the preparation of supplemental or subsequent environmental review have occurred and provides the required documentation under CEQA Guidelines Section 15164.

3.6 DETERMINATION

There are no substantial changes proposed by the 2021 Revised Project Design or in the circumstances in which the 2021 Revised Project Design will be undertaken that require major revisions of the 2017 MND. The proposed 2021 Revised Project Design does not require preparation of a new subsequent or supplemental EIR, ND, or MND, due to either the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects. As illustrated herein, the proposed 2021 Revised Project Design is consistent with the previous 2017 MND and would involve only minor changes; therefore, an Addendum is appropriate CEQA compliance for the proposed project.

3.7 FINDING

Based on an examination of the analysis, findings, and conclusions of the 2017 MND, the potential impacts of the proposed 2021 Revised Project Design remains within the impacts previously analyzed and disclosed in the 2017 MND and none of the conditions in CEQA Guidelines Section 15162 exist (CEQA Guidelines § 15164). Therefore, an addendum to the 2017 MND is the appropriate environmental document for the 2021 Revised Project Design and no further analysis is required under CEQA before undertaking the proposed project.

Signature	Date
Name	Title

4 ENVIRONMENTAL ANALYSIS

The purpose of the checklist is to evaluate the categories in terms of any changed condition (e.g., changed circumstances, project changes, or new information of substantial importance) that may result in a changed environmental result (e.g., a new significant impact or substantial increase in the severity of a previously identified significant effect) (CEQA Guidelines § 15162).

The questions posed in the checklist come from Appendix G of the CEQA Guidelines and the 2017 MND. A "no" answer does not necessarily mean that there are no potential impacts relative to the environmental category, but that there is no change in the condition or status of the impact since it was analyzed and addressed with mitigation measures in the 2017 MND.

EXPLANATION OF CHECKLIST EVALUATION CATEGORIES

Environmental Subject Area

The checklist utilized is from Appendix G of the 2021 CEQA Guidelines. As discussed, most of the evaluation criteria only underwent minor changes, clarifications, or were moved to various other sections, and two criteria sections – Energy and Wildfire - have been added. For this analysis, revisions to the evaluation criteria between the 2017 MND evaluation and the 2021 Guidelines will be noted in underlined type (<u>underlined</u>) for added text and strikeout text (~~strikeout~~) for deleted text in the criteria in this section.

Conclusion in 2017 MND and Related Documents

This column identifies the conclusion of the 2017 MND relative to the Environmental Subject Area listed under each topic as identified in the 2017 MND.

Do the Proposed Changes Involve New Impacts?

Pursuant to CEQA Guidelines Section 15162, subd. (a)(1), this column indicates whether the 2021 Revised Project Design will result in new significant environmental impacts not previously identified or mitigated by the 2017 MND or whether the 2021 Revised Project Design will result in a substantial increase in the severity of a previously identified significant impact.

New Circumstances Involving New Impacts?

Pursuant to CEQA Guidelines Section 15162, subd. (a)(2), this column indicates whether the 2021 Revised Project Design results in substantial changes with respect to the circumstances under which the project is undertaken that will require major revisions to the 2017 MND due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.

New Information Requiring New Analysis or Verification?

Pursuant to CEQA Guidelines Section 15162, subd. (a)(3)(A-D), this column indicates whether new information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the 2017 MND was adopted, shows any of the following:

(A) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;

(B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;

(C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

(D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

If the additional analysis completed as part of this environmental review were to find that the conclusions of the 2017 MND remain the same and no new significant impacts are identified, or identified impacts are not found to be substantially more severe, or additional mitigation is not necessary, then the question would be answered "no" and no additional environmental document would be required.

Mitigation Measures Implemented or Address Impacts

Pursuant to CEQA Guidelines Section 15162, subd. (a)(3), this column indicates whether the 2017 MND provides mitigation measures to address effects in the related impact category. Any previously adopted mitigation measures will be identified. The response will also address proposed revisions to previously adopted mitigation measures. These mitigation measures will be implemented with the construction of the project, as applicable. If "NA" is indicated, the 2017 MND has concluded that the impact either does not occur with this project or is not significant, and therefore no additional mitigation measures are needed.

Discussion

The Discussion section provides a narrative of the assumptions and conclusions identified for the 2018 Original Project Design in the 2017 MND, and analyzes how those conclusions compare to the 2021 Revised Project Design.

Mitigation Measures

Applicable mitigation measures from the 2017 MND identified in each environmental category where the 2017 MND identified mitigation. Any revisions or new measures are also identified in this section.

Conclusions

A discussion of the conclusion relating to the analysis is contained in each section.

4.1 AGRICULTURE & FORESTRY RESOURCES

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
II. AGRICULTURE AND FORESTRY RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:					
a) Convert Prime Farmland, Unique Farmland or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	Less Than Significant With Mitigation Incorporated	No	No	No	AG-1
b) Conflict with existing zoning for agricultural use or a Williamson Act contract?	Less Than Significant	No	No	No	None
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))?	Less Than Significant	No	No	No	None
d) Result in the loss of forest land or conversion of forest land to non-forest use?	Less Than Significant	No	No	No	None
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?	Less Than Significant	No	No	No	None

4.1.1 Discussion

Summary of 2017 MND

Based on the analysis of the potential effects of the proposed Project, the Initial Study concluded that with Mitigation Measure AG-1 the impact to agriculture and forest resources will be less than significant. An area of semi-active farmed Prime Farmland occurs within the northwestern portion of the site (Figure 4, 2017 MND), and is not identified for use as recharge or for other facilities. Fallowed Prime Farmland will remain fallowed with the option to use for recharge operations.

The Project will not involve any land use zoning or designation changes and there is no Williamson Act farmland within the Project site. Additionally, there are no forest or timber lands within the Project site.

2021 Revised Project Analysis

The 2021 Revised Project will occur within the same location as previously analyzed. The recharge basins will occur within the same areas as previously assessed, and the Prime Farmland identified in the 2017 MND will remain as farmland.

4.1.2 Mitigation Measures

The 2017 MND identified the following mitigation measure to reduce impacts to less than significant.

AG-1: **Prime Farmland Avoidance** – The Agency will not perform recharge operations on the 60 acres of semi active farmed Prime Farmland on the northwest corner of the property.

Revisions to Mitigation Measures:

The 2021 Revised Project Design does not require a modification of the existing measure or the addition of any new measures to reduce impacts to less than significant.

4.1.3 Conclusion

The 2021 Revised Project Design does not change the type or extent of development analyzed in the 2017 MND. Development of the 2021 Revised Project Design does not propose substantial agricultural and forest resources changes beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant agricultural and forest resources impacts or more severe agricultural and forest resource impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.2 AIR QUALITY

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:					
a) Conflict with or obstruct implementation of the applicable air quality plan?	Less Than Significant	No	No	No	None
~~b) Would not violate any air quality standard or contribute substantially to an existing or projected air quality violation~~	Less Than Significant	NA – Removed from Guidelines	NA – Removed from Guidelines	NA – Removed from Guidelines	NA – Removed from Guidelines
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	Less Than Significant With Mitigation Incorporated	No	No	No	AQ-1
c) Expose sensitive receptors to substantial pollutant concentrations?	Less Than Significant	No	No	No	None
d) ~~Create objectionable~~ Result in other emissions (such as those leading to odors adversely affecting a substantial number of people?	Less Than Significant	No	No	No	None

4.2.1 Discussion

Summary of 2017 MND

Project impacts were determined to be less than significant, except for potentially NOx emissions during construction of overlapping activities.

The 2017 MND identified that the Project's construction emissions are short term or temporary but have the potential to result in a significant impact on air quality. Construction activities for the project would generate temporary emissions of volatile organic compounds (VOC) and NOX, CO, PM10, and PM2.5. VOC, NOX, and CO emissions are associated primarily with mobile equipment exhaust, including off road construction equipment and on road motor vehicles. Fugitive particulate matter dust emissions are associated primarily with site preparation and travel on unpaved roads and vary as a function of parameters such as soil silt content, soil moisture, wind speed, acreage of disturbance area, and miles traveled by construction vehicles. Emissions would vary from day to day, depending on the level of

activity, the specific type of construction activity occurring, and, for fugitive dust, prevailing weather conditions.

The Project is located in the Antelope Valley Air Quality Management District (AVAQMD), which has established recommended annual and daily thresholds of significance for criteria pollutant emissions as shown in 2017 MND Tables 2.4-1 and 2.4-2, respectively. A project with emission rates below these thresholds is considered to have a less than significant effect on regional and local air quality throughout the AVAQMD.

The 2017 MND modeled potential construction emissions, based on the scope of work and construction duration. Construction was assumed to involve demolition of several structures, including one small residence; the amount of demolition was deemed negligible due to the overall project size. The remainder of the project consists primarily of drilling, earthmoving, and small construction projects (e.g. turnout installation [to withdraw water from the California Aqueduct], underground pipeline placement; pump metering/booster station and storage tank construction). Fugitive dust generation was estimated for drilling and grading, spreading and stockpiling of spoils, and above ground pipeline installation. Paved and unpaved road dust would occur from worker vehicle trips and haul truck trips on highways, local roads, and access roads. Particulate emissions associated with vehicle travel over unpaved roads were conservatively estimated assuming a one way distance of 3 miles per trip, the anticipated maximum distance traveled over unpaved roads for both worker and delivery vehicles. The project would implement applicable AVAQMD rules and regulations such as: Rule 1140 (Abrasive Blasting), Rule 1113 (Architectural Coatings), Rule 1110.2 (Emissions from Stationary, Non-road & Portable Internal Combustion Engines), as well as appropriate dust-abatement measures to comply with regulations Rule 401 (Visible Emissions), Rule 403 (Fugitive Dust), and Rule 404 (Particulate Matter Concentration).

Construction of the project was expected to last approximately 24 months. The construction emissions analysis relied on a project specific construction schedule and inventory of construction equipment estimates. The estimated construction workforce is a maximum of thirty workers per day. Project construction was conservatively analyzed using multiple overlapping activity scenarios to obtain the worst case daily emissions.

As shown in Table 2.4-1 of the 2017 MND, the annual construction emissions associated with the Project are below the AVAQMD annual thresholds. However, when modeled for overlapping activities, (refer to 2017 MND Table 2.4-2), daily emissions associated with the worst case overlapping construction activity scenario were only exceeded for NOx by approximately 30 pounds per day. Modeling assumptions and details are provided in the Air Quality Analysis Technical Report located in Appendix C of the 2017 MND.

As such, a mitigation measure was developed to reduce impacts to less than significant.

2021 Revised Project Analysis

An Air Quality Analysis (Appendix B) was conducted based on the 2021 Revised Project Design, using the assumptions presented in the tables in Section 2.4 of this Initial Study Addendum. The latest version of CalEEMod (2020.4.0) was utilized to analyze the 2021 Revised Project emissions on only activities that were significantly updated, which are as follows: Activity 3: Transmission Facility / Underground Pipeline; Activity 4: Recharge Facility / Recharge Basin, Grading, Above-ground Pipeline Install; and Activity 5:

Recovery Facilities / Extraction Wells / Recovery (Activity numbers were assigned to facilitate the air quality analysis).

Construction of the project is expected to last approximately 21 months. The construction emissions analysis relied on a project specific construction schedule and inventory of construction equipment estimates identified in Section 2.4 of this Addendum. The estimated construction workforce is a maximum of 30 workers per day. Project construction was conservatively analyzed using multiple overlapping activity scenarios to obtain the worst case daily emissions.

The results of the Air Quality analysis conducted for the 2021 Revised Project concluded that construction emissions for the project would not exceed the AVAQMD's daily emission thresholds at the regional level as indicated in Table 4.2-1, and therefore the impact would not be considered significant. The emissions were calculated using the 2017 MND Mitigation Measure AQ-1, which requires the use of off-road construction diesel engines that meet Tier 4 interim California Emission Standards. Unmitigated emissions would exceed the AVAQMD NOx threshold of 137 pounds per day by approximately 50 pounds per day, while mitigated emissions would be below the same threshold by approximately 0.85 pounds per day.

AECOM had previously performed an air quality analyses for this project for the 2017 MND. Table 4.2-1 identifies the 2017 MND thresholds, as well as the 2021 Revised Project design emissions, both without the 2017 MND mitigation measure in place (unmitigated) and with 2017 MND mitigation measure in place (mitigated) as a comparison of Project emissions.

As such, the mitigation measure developed for the 2017 MND was determined to reduce impacts to less than significant. No further mitigation is necessary to reduce impacts to less than significant under the 2021 Revised Project.

Table 4.2-1: Air Quality Emissions Project Comparison

Activity	Pollutant Emissions (lbs/day)				
	VOC	NOx	CO	PM10	PM2.5
Activity 3: Transmission Facility / Underground Pipeline					
2017 Original Project Design[2]	1.36	21.76	39.21	10.05	2.98
2021 Revised Project Design - Unmitigated	4.47	38.71	44.65	4.19	2.21
2021 Revised Project Design - Mitigated	1.84	26.26	56.09	2.65	0.08
Mitigated Emission Change	0.48	4.50	16.88	-7.40	-2.90
Activity 4: Recharge Facility / Recharge Basin, Grading, Above-ground Pipeline Install					
2017 Original Project Design[2]	0.61	4.43	12.02	3.01	1.73
2021 Revised Project Design - Unmitigated	6.89	66.94	59.23	6.38	3.31
2021 Revised Project Design - Mitigated	2.29	32.24	70.63	3.73	0.89
Mitigated Emission Change	1.68	27.81	58.61	0.72	-0.84
Activity 5: Recovery Facilities / Extraction Wells / Recovery					
2017 Original Project Design[2]	2.79	45.12	77.05	38.47	5.67
2021 Revised Project Design - Unmitigated	9.71	88.81	74.32	6.45	3.78
2021 Revised Project Design - Mitigated	5.10	73.69	150.70	3.92	1.42
Mitigated Emission Change	2.31	28.57	73.65	-34.55	-4.25
Subtotal of Activities 1,2,5 (overlap Year 1, months 1-3)					
2017 Original Project Design[2]	5.79	88.06	146.07	57.3	10.56
2021 Revised Project Design - Unmitigated	12.71	131.75	143.34	25.28	8.67
2021 Revised Project Design - Mitigated	8.10	116.63	219.72	22.75	6.31
Subtotal of Activities 3,5 (overlap Year 1, months 11,12)					
2017 Original Project Design[2]	4.15	66.88	116.26	48.52	8.65
2021 Revised Project Design - Unmitigated	14.18	127.52	118.97	10.64	5.99
2021 Revised Project Design - Mitigated	6.94	99.95	206.79	6.58	1.50
Subtotal of Activities 3,5,6 (overlap Year 2, months 1-5)					
2017 Original Project Design[2]	30.99	97.09	153.59	70.08	13.11
2021 Revised Project Design - Unmitigated	41.02	157.73	156.30	32.20	10.45
2021 Revised Project Design - Mitigated	33.78	130.16	244.12	28.14	5.96
Subtotal of Activities 4.5,6 (overlap Year 2, month 6)					
2017 Original Project Design[2]	30.24	79.76	126.4	63.05	11.86
2021 Revised Project Design - Unmitigated	43.44	185.96	170.89	34.39	11.54
2021 Revised Project Design - Mitigated	34.23	136.14	258.65	29.23	6.77
2017 Maximum Daily Construction Emissions[2]	30.99	97.09	153.59	70.08	13.11
2021 Unmitigated Maximum Daily Construction Emissions	43.44	185.96	170.89	34.39	11.54
2021 Mitigated Maximum Daily Construction Emissions	**34.23**	**136.14**	**258.65**	**29.23**	**6.77**
Change in Maximum Daily Construction Emissions - Unmitigated	12.45	88.87	17.30	-35.69	-1.57
Change in Maximum Daily Construction Emissions - Mitigated	3.24	39.05	105.06	-40.85	-6.34
AVAQMD Thresholds	**137**	**137**	**548**	**82**	**65**
Exceeds Thresholds	No	**No**	No	No	No

Notes:
[1] Source: CalEEMod Version 2020.4.0
[2] Source: 2017 AECOM – Air Quality Technical Memorandum

4.2.2 Mitigation Measures

The 2017 MND identified the following mitigation measure to reduce impacts to less than significant:

AQ-1 Minimization Measure for NOx Related Emissions - Construction contractor shall use off road construction diesel engines that meet, at a minimum, the Tier 4 interim California Emissions Standards, unless such an engine is not available for a particular item of equipment. Tier 3 engines will be allowed on a case-by-case basis when the contractor has documented that no Tier 4 interim equipment, or emissions equivalent retrofit equipment is available for a particular equipment type that must be used to complete construction. Documentation shall consist of signed written statements from at least two construction equipment rental firms.

Revisions to Mitigation Measures:

The 2021 Revised Project Design does not require a modification of the existing measure or any new measures to reduce impacts to less than significant.

4.2.3 Conclusion

The 2021 Revised Project Design does not change the type or extent of development analyzed in the 2017 MND. Applicable mitigation measures previously identified in the 2017 MND will be required as set forth in the MMRP, and no considerably different mitigation measures that may substantially reduce impacts have been identified or rejected. The 2021 Revised Project Design does not propose substantial air quality changes beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant or more severe air quality impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.3 BIOLOGICAL RESOURCES

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
IV. BIOLOGICAL RESOURCES: Would the project:					
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	Less Than Significant With Mitigation Incorporated				BIO-1, through BIO-5, BIO-7 through BIO-9 BIO-11 BIO-12
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?	Less Than Significant				None
c) Have a substantial adverse effect on <u>state or</u> 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	Less Than Significant With Mitigation Incorporated				BIO-6, BIO-7 BIO-10, BIO-12
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	Less Than Significant				None
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	Less Than Significant				None

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
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?	Less Than Significant	No	No	No	None

4.3.1 Discussion

Summary of 2017 MND

No impacts or less than significant impacts were determined to be applicable to following the criteria, and no further discussion is warranted:

b) Riparian habitat or sensitive habitat identified in Federal, State and/or local plans – none was found within the Project site.

d) Wildlife corridors and/or nursery sites – none exist within the Project site.

e) Local biological protection ordinances – no ordinances are applicable to the Project site.

f) Conflict with adopted Federal, State and/or local plans – there are no plans applicable to the Project site.

Criteria IV(a): State and Federal sensitive species and habitat modification

Based on the results of the CNDDB search and the field surveys, the Project site is known to or expected to support sensitive biological resources and native habitats which will be disrupted or removed by the proposed Project. Potential impacts include destruction of nests and disruption of natural nesting behaviors in nesting birds, including raptors, and removal of potentially suitable habitats for sensitive and special-status wildlife species, including American badger, desert kit fox, burrowing owls, and others.

The Project would impact approximately 1,200 acres of potentially suitable foraging and sheltering habitats utilized by native wildlife species. Permanent impacts include those areas which would be developed to support groundwater recovery and monitoring wells, aboveground pipelines, and related infrastructure, and total approximately 12 acres. Temporary impacts include vegetation clearing, earthen berm construction, and regular, rotating inundation of the recharge basins, and would affect approximately 1,200 acres of the site. Rotating inundation would temporarily remove an average of up to 400 acres of the recharge basins from use as habitat at any one time. Other temporary impacts include excavations and work areas associated with installation of the buried pipelines, and will affect approximately 70 acres of the site; these areas are expected to occur mostly within the recharge basin footprint.

The 2017 MND identifies the general location of the flood recharge areas in *Figure 2 Schematic Flood Recharge Operations,* and in Figure 2.4-7 of this Addendum. However, the 2017 MND did not identify the locations or how the 400 acres would be rotated, other than the basins would be rotated in various areas of the 1,200 acre Project site.

No federally- or State-listed species were observed within the Project site. Although one State candidate, tricolor blackbird, was observed on an adjacent property, the Project site does not support suitable nesting habitat for this species, and foraging habitats are common in the vicinity. Implementation of appropriate mitigation measures including pre-construction survey for nesting birds, active burrowing owl burrows, and active desert kit fox and American badger dens, will avoid direct adverse impacts to special-status species, should they occur within the Project Area.

Impacts to suitable habitats for native common and special-status plant and wildlife species as a result of construction of the proposed Project include the permanent removal of approximately 12 acres and temporary impacts to approximately 70 acres of suitable habitat, as well as construction of approximately 1,200 acres of recharge basins. Operations associated with inundation of the basins will periodically, temporarily remove an average of up to 400 acres of habitat at any one time. These impacts are rotational, irregular in timing, and are not expected to be continual; the majority of the basins will remain available for use as foraging and transitory habitat by native wildlife.

Because special-status plant species are not expected to occur, impacts to special-status plant species habitats are not expected to be significant.

Nonetheless, habitat management lands will provide approximately 322 acres of undisturbed native and naturalized vegetation communities that will provide habitat for both common and special-status plant and wildlife species within the Project site. Similar habitats also are common within the Project vicinity. Thus, loss of habitat due to permanent impacts associated with the Project and temporary loss due to inundation of the recharge basins does not represent a substantial impact to any species.

Wildlife species may use the open spaces within the Project site for dispersal and transitory movement, and may be subject to potential injury or entrapment in open trenches and open-ended pipes. To prevent entrapment, injury, and mortality, mitigation measures are required to reduce impacts to less than significant.

Additional mitigation measures to protect habitat and species included general crew training, staging guidelines and preparation of a Habitat Mitigation Management Program (HMMP).

Criteria IV(c): State and Federal wetlands

The 2017 MND identified that there were no federally protected waters occur within the Project site. None of the potential wetland and waters features exhibit hydrologic connection to any Traditional Navigable Waters (TNWs). Thus, there will be no impacts to federally protected wetlands.

It should be noted that the CEQA Guidelines in place at the time of the 2017 MND only required an assessment of potential impacts to federal waters.

However, based on comments from the California Department of Fish and Wildlife (CDFW) during the pubic comment period, Mitigation Measure BIO-10 was added to require a formal jurisdictional delineation for both State and Federal waters. Prior to the 2017 MND adoption, the Agency fulfilled the requirements of BIO-10 and conducted the jurisdictional waters assessment. The results of that assessment were also included in the final 2017 MND that was adopted.

The 2017 Jurisdictional Delineation identified that the Project site supported two intermittent streams and two potential wetland features and the features are potential CDFW-jurisdictional streambeds, subject to CDFW regulatory authority under section 1600 *et seq.* of the California Fish and Game Code. Refer to Figure 4.3 1 for the location of the drainages from the 2017 Biological Resources Report that supported the 2017 MND.

The 2017 MND identified that the Project would not remove or alter these features; recharge basins and associated infrastructure will be constructed outside the historic drainages to preserve natural migratory movement of the streams and to prevent the constraint of flows where previously they dispersed over wide, flat plains, therefore, the disruption of or impacts to drainages and potential wetlands are avoided. Constraint of flows within the drainages, particularly where they cross open, relatively flat grasslands, could cause increased erosion and channelization of the features in these areas, as well as sedimentation of downstream waters. In order to avoid this potential impact, drainages will be protected within on-site habitat management lands that will be preserved and managed by the Agency.

The 2017 MND also identified that a variable 50- to 100-foot buffer will be established along both sides of the drainages, and around the seasonal wetland feature. The buffer will be wider along portions of the drainage course where historic aerials show wider extents of inundation, and narrower where flows are naturally more restricted to the defined channel. Avoidance of construction within the channel and floodplain, and implementation of suitable buffers, will avoid impacts to waters and wetlands. Thus, no impacts to waters of the State are anticipated.

However, should the Project implementation require impacts to waters of the State, the Project will obtain all applicable regulatory permits prior to any fill or alteration of waters features, including submission of a Notification of Lake or Streambed Alteration application, in order to support the CDFW in determining the need for a Lake and Streambed Alteration Agreement (LSA). Issuance of an LSA for the Project will require the CDFW, as a Responsible Agency, to ensure CEQA compliance, including employment of adequate avoidance, mitigation, monitoring, and reporting commitments associated with the LSA.

2021 Revised Project Analysis

A Biological Resources Analysis of the 2021 Revised Project Design was prepared by ELMT Consulting in September 2021 (Appendix C).

The 2021 Biological Resources Analysis did not discover any major changes in site conditions since the 2017 assessment, except for a small thicket of sandbar willow found only within and near a pump discharge basin near the middle of the southern boundary of the project site. This plant community was not documented in the plant community section of the 2017 biological report, but it was mentioned in the water features section of the 2017 biological report. This area is fed constantly by water from the

adjacent pump station and also supports a small pond feature as a result of overflow within the pump station. Figure 4.3 1 identifies the drainages from the 2017 Biological Resources Report that supported the 2017 MND, and those features were confirmed in the 2021 Biological Resources Analysis. No additional drainages were discovered in the 2021 Biological Resources Analysis.

The 2021 Biological Resources Analysis analyzed how the design changes would or would not impact the site habitat and wildlife and also assessed the change in the location of the habitat management lands.

The 2021 Biological Resources Analysis (Appendix C) determined that while the original design would only utilize 400 acres annually for recharge, the design including rotating the 400 acre recharge area throughout the approximately 1,200 acre site, similar to agricultural farming thus disturbing all of the 1,200 acres over time. With the revised design being fixed basins of approximately 890 acres, and recharge occurring over a shorter time frame, wildlife will have a fixed, consistent landscape in which to forage and nest as well as fixed areas for water sources. Overall, this would provide a benefit of stability to the on-site wildlife.

Further, the 2021 Biological Resources Analysis also evaluated the re-location of the 322 acres designated for habitat management in the 2017 MND. The 2017 design location provided larger blocks of habitat in the northern and southern portions of the property with narrow pathways of refuge and movement in two drainages. The 2021 Revised Project design essentially eliminates the southern block and reduces the northern block but provides a wider corridor of preservation in the drainage located in the middle of the site, as well as a wider strip along the aqueduct to facilitate wildlife movement between the northern and southern portions of the site, as well as good habitat in the central drainage area. The larger blocks of habitat, along with the constructed basins, provide higher quality local wildlife movement opportunities across the site, while providing potential watering holes.

Based on the result of the 2021 updated literature review and field investigation, and revised project design, the overall conclusions and mitigation measures contained in the 2017 MND remain valid. Impacts to special-status plant and wildlife species will be less than significant with incorporation of the mitigation measures (BIO-1 thru 12) detailed in the 2017 MND.

4.3.2 Mitigation Measures

The 2017 MND identified the following mitigation measure to reduce impacts to less than significant:

For brevity, these measures are summarized below, and the full text is included in Appendix A.

BIO-1 Burrowing Owls (Pre-Construction Surveys)
BIO-2 Desert Kit Fox and American Badger (Pre-Construction Surveys)
BIO-3 Nesting Birds (Pre-Construction Surveys)
BIO-4 Animal Movement and Entrapment (Trenches)
BIO-5 Animal Movement and Entrapment (Pipes)
BIO-6 Erosion and Sediment Control
BIO-7 Special-Status Plant surveys
BIO-8 Swainson’s Hawk (focused surveys prior to recharge basin construction)
BIO-9 Tri-colored Blackbirds (focused surveys prior to recharge basin construction)

BIO-10 Jurisdictional Drainages and Wetlands and Permitting (prior to recharge basin construction)
BIO-11 Habitat Mitigation (prepare Habitat Mitigation Management Program)
BIO-12 General (construction crew training, site and staging guidelines)

Revisions to Mitigation Measures:

The 2021 Revised Project Design does not require a modification of any existing measure or the addition of any new measures to reduce impacts to less than significant.

Because the design has changed, the Jurisdictional Delineation completed under BIO-10 is required to be revised to ensure that the Project will not impact jurisdictional drainages. However, the 2021 Revised Project Design also includes buffer areas around the drainage areas, to reduce impacts.

4.3.3 Conclusion

The 2021 Revised Project Design does not change the type or extent of development analyzed in the 2017 MND. Applicable mitigation measures previously identified in the 2017 MND will be required as set forth in the MMRP, and no considerably different mitigation measures that may substantially reduce impacts have been identified or rejected. Development of the 2021 Revised Project Design does not propose substantial changes in biological resources beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant biological resource changes or more severe biological resource impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

Figure 4.3-1: Potential Water Features Identified in Biological Studies

4.4 CULTURAL RESOURCES

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
V. CULTURAL RESOURCES: Would the project:					
a) Cause a substantial adverse change in the significance of a historical resource ~~as defined in~~ pursuant to 15064.5?	Less Than Significant	No	No	No	None
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to 15064.5?	Less Than Significant With Mitigation Incorporated	No	No	No	CUL-1
~~c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?~~	Refer to Section 4.7, Criterion VII(f)	(NA - Moved to Geological Resources in Guidelines)	(NA - Moved to Geological Resources in Guidelines)	(NA - Moved to Geological Resources in Guidelines)	Refer to Section 4.7, Criterion VII(f)
c) Disturb any human remains, including those interred outside of formal cemeteries?	Less Than Significant With Mitigation Incorporated	No	No	No	CUL-2

4.4.1 Discussion

Summary of 2017 MND

A Cultural Resources Assessment was included in the analysis provided in the 2017 MND. As part of the assessment, A Phase I cultural resources intensive pedestrian survey was conducted to determine the location of unknown cultural resources in the Project area. Sites identified during the surveys were documented in detail to allow for the completion of all appropriate Department of Parks and Recreation (DPR) 523 forms.

The survey conducted within the Project Area identified two archaeological isolates (PD-1 and PD-2) as well as four archaeological sites (PD-3, PD-4, PD-5, and PD-6). A previously recorded site, PD-7, is a section of the East Branch of the California Aqueduct.

Sites and isolates PD-1 through PD-6 are not eligible for the CRHR. No further work is necessary for the recorded components of these sites. The East Branch was evaluated as part of a 2009 documentation, for historical significance under the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR) criteria as a water conveyance system in California. According to that

evaluation, the East Branch appears eligible for both the NRHP and the CRHR under Criterion 1/A for its association and contribution to the development of water systems in the state of California. In addition, it appears eligible for both the NRHP and the CRHR under Criterion 3/C for its engineering design. As such, previously recorded site P-19-004154 (PD-7) is recommended eligible under the CRHR.

The proposed Project components will affect the East Branch of the California Aqueduct for turnout installation. However, this work does not affect site eligibility under criterion 1. The site still serves its purpose of being a significant reminder of history and current supplier of water for the Los Angeles area. It is still recommended that impacts are mitigated as much as possible during installation and that part time monitoring occur during construction activity on this site.

Buried cultural resources may possibly be affected by the Project, however, the incorporation of management and monitoring protocols will reduce this to less than significant. In addition, the construction of turnout attachments to portions of the East Branch of the California Aqueduct (P-19-004154) will not affect site significance as its integrity as an important historical resource that continues to supply water to the Los Angeles area is maintained.

2021 Revised Project Analysis

An evaluation of the 2021 Revised Project Design's potential impacts to Cultural Resources was conducted in August 2021 (Appendix D).

The analysis identified that the revised design does not change the cultural sensitivity of the Project area because the overall Project location has not changed. The cultural resources known to be present within the Project area are not "significant" cultural resources as identified in the 2017 MND. A Cultural Resources Monitoring and Mitigation Plan for the Project was developed for the original project. The plan contains a set of protective measures that would also apply to the 2021 Revised Project design.

If and when cultural resources are encountered, the Cultural Resources Monitoring and Mitigation Plan currently in place for the Project allows the archaeologist to halt and divert work in the immediate area and initiate procedures so that the resource can be protected, preserved, and evaluated, as described in the existing Cultural Resources Monitoring and Mitigation Plan.

4.4.2 Mitigation Measures

The 2017 MND identified the following mitigation measure to reduce impacts to less than significant:

CR-1: **Cultural Resources Monitoring:** The Project site has been identified to have a low to moderate potential of finding significant archaeological resources lacking surface manifestations that may be encountered during Project construction. To lessen the impact of unknown archeological resources, the Agency will develop a Cultural Resources Monitoring and Mitigation Plan prior to start of ground disturbance. This plan will implement part time monitoring by a qualified archeologist and or a Native American Monitor. In the event that project construction activities result in a finding of significant importance, the qualified archeologist may increase the level of monitoring. If no findings occur during the part time monitoring, the archeologist may further reduce or eliminate the monitoring. During a find of a potentially significant archaeological resource, the

resource will be inventoried and evaluated to ascertain whether the resource meets the criteria for listing on the California Register of Historical Resources. After the discovery, all work being conducted within the vicinity of the discovery will be halted or diverted away from the site of discovery until a qualified archaeologist can assess the potential significance of the find.

CR-2: **Regulation Compliance:** The Agency will comply with Health and Safety Code Section 7050.5, CEQA Section 15064.S(e), and Public Resources Code Section 5097.98, which mandate the process to be followed in the unlikely event of an accidental discovery of any human remains in a location other than a dedicated cemetery.

Revisions to Mitigation Measures:

The 2021 Revised Project Design does not require a modification of the existing measure or the addition of any new measures to reduce impacts to less than significant. Mitigation Measure CR-1 has been met as a *Cultural Resources Monitoring and Mitigation Plan* (Plan) was prepared in July 2020. The Plan as it is presented has been determined to apply to the 2021 Revised Project Design. Neither a second plan nor additional mitigation is required.

4.4.3 Conclusion

The 2021 Revised Project Design does not change the type or extent of development analyzed in the 2017 MND. Applicable mitigation measures previously identified in the 2017 MND will be required as set forth in the MMRP, and no considerably different mitigation measures that may substantially reduce impacts have been identified or rejected. Development of the 2021 Revised Project Design does not propose substantial changes in cultural resources beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant cultural resource changes or more severe cultural resource impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.5 ENERGY

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
VI. ENERGY: Would the project:					
a) Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	Not Analyzed Less Than Significant	No	No	No	None
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	Not Analyzed Less Than Significant	No	No	No	None

4.5.1 Discussion

An analysis of the energy consumption was not required by the CEQA Guidelines at the time the 2017 MND was prepared. Therefore, the energy consumption was not analyzed as part of the 2017 MND. However, the energy usage was known at the time of the 2017 MND. Therefore, the following discussion represents an analysis of the 2017 energy consumption based on the parameters known for the 2017 Original Design, and how they would have been evaluated if the Energy CEQA criteria were in place at the time of the 2017 MND preparation. Impacts associated with the 2021 Revised Project Design are then evaluated against the 2017 data and analysis to determine if the proposed changes are more severe or there are new circumstances, new information and/or new mitigation necessary.

Summary of 2017 MND

Assumptions for Analysis under Current CEQA Guidelines:

The 2017 Original Design identified that recovery would occur by the use of 18 new groundwater extraction wells designed at approximately 2,500 gallons per minute (gpm) each that will deliver the recovered water back to the California Aqueduct. During wet years with recharge operations, the power usage will be zero. During dry years with recovery operations, wells and pump station may be running continuously. The 2017 MND identified that the recovery operations would have an estimated power use range of of 0 to 2,720,000 kW-hrs per year. The booster station would have an estimated power use range of 0 to 2,380,000 kW-hrs per year. During wet years with recharge operations, the power usage will be zero. During dry years with recovery operations, wells and pump station may be running continuously.

Operation of the bank would require one full time operator and assistant on site. The operator and assistant would travel daily with an assumed light duty (250 hp) pickup truck, 100 miles per day for

operations. There would also be the need for additional staff to assist with berm construction and pipe relocations operations on a periodic basis. This crew is anticipated to travel in one light duty (250 hp) pickup truck with trailer, 100 miles per day, 5 days every four months.

Analysis of 2017 Original Project Design under Current CEQA Guidelines

a) Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Less Than Significant Impact. Energy consumption is generally evaluated by the project's energy use and by the number of vehicle trips for construction and operations workers. Of all the 2017 Original Project components, energy consumption would be mostly generated during recovery operations by the use of 18 wells and by the need to periodically regrading/re-establish the berms for the recharge basins. Operational trips for maintenance of the wells and booster stations are negligible as they require few vehicles and few trips.

The energy consumption for the recovery operations was identified as 18 new groundwater extraction wells designed at approximately 2,500 gallons per minute (gpm) which would have an estimated power use range of of 0 to 2,720,000 kW-hrs per year. The booster station would have an estimated power use range of 0 to 2,380,000 kW-hrs per year. The energy consumption for the continual re-establishment of the berms for the recharge basins was not identified in the 2017 MND.

Electricity used for the project during construction and operations would be provided by Southern California Edison, which serves more than 15 million customers. SCE derives electricity from varied energy resources including: fossil fuels, hydroelectric generators, nuclear power plants, geothermal power plants, solar power generation, and wind farms. Project-related vehicle trip energy consumption will be predominantly gasoline and diesel fuel. Gasoline (and other vehicle fuels) are commercially provided commodities and would be available to the project patrons and employees via commercial outlets. Therefore, there

The 2017 Original Project does not represent wasteful, inefficient or unnecessary consumption of energy resources primarily because the overall Project purpose is for the public benefit to provide a source of drinking water for the region. The Project is being managed by a public agency, for public benefit, and therefore, the Agency has a fiduciary responsibility to ensure that the Project is designed and operated in the most efficient and cost-effective manner possible. Therefore, the 2017 Original Project does not represent wasteful, inefficient or unnecessary consumption of energy resources. Impacts are less than significant, and no mitigation is required.

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

Less Than Significant Impact. California has numerous regulations and plans regarding renewable energy and energy efficiency. The regulations and plans primarily target two major sectors: transportation and physical structures.

Transportation aspects of the Project include use of heavy equipment for construction, operations to re-establish berms, and the use of small vehicles for maintenance. The 2017 Original Project Design would not obstruct any state or local plan because the Agency would comply with all regulations for

transportation including use of low-sulfur diesel in construction equipment, proper maintenance of all construction equipment and vehicles, and maintaining access roads in good condition throughout the site to ensure fuel consumption efficiency. Regarding building construction, the structure that would house the booster pump station would be designed and constructed consistent with the latest design standards, which includes Title 24 that requires the structure to be constructed with reduced energy consumption features.

Therefore, the 2017 Original Project does not Conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Impacts are less than significant, and no mitigation is required.

2021 Revised Project Analysis

The need for continual re-establishment of the recharge basins was eliminated as the 2021 Revised Project Design includes engineered berms, hardened to protect them from localized flooding.

The number of wells was also increased from 18 to 28 in the new design, however, the new wells will operate at only 1,800 to 2,200 gpm which. The increase in the number of wells at a lesser power rate represents an increase in flexibility, location and timing for recovery.

The 2021 Revised Project Design does not represent wasteful, inefficient or unnecessary consumption of energy resources primarily because the overall Project purpose is for the public benefit to provide a source of drinking water for the region. The Project is being managed by a public agency, for public benefit, and therefore, the Agency has a fiduciary responsibility to ensure that the Project is designed and operated in the most efficient and cost-effective manner possible. Therefore, the 2021 Revised Project Design does not represent wasteful, inefficient or unnecessary consumption of energy resources. Impacts are less than significant, and no mitigation is required.

4.5.2 Mitigation Measures

No mitigation measures are required for the 2017 Original Project Design had energy resources been evaluated in the 2017 MND. The 2021 Revised Project Design also does not require the addition of any measures to reduce impacts to less than significant.

4.5.3 Conclusion

The proposed Project does not change the type or extent of development analyzed in the 2017 MND. Implementation of the 2021 Revised Project Design does not propose substantial energy changes beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant energy impacts or more severe energy impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.6 GEOLOGY AND SOILS

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
VII. GEOLOGY AND SOILS: Would the project:					
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:	Less Than Significant With Mitigation Incorporated	No	No	No	GEO-2, GEO-3, GEO-4
• 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.					
• Strong seismic ground shaking?					
• Seismic-related ground failure, including liquefaction?					
• Landslides?					
b) Result in substantial soil erosion or the loss of topsoil?	Less Than Significant With Mitigation Incorporated	No	No	No	GEO-1
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- site or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	Less Than Significant With Mitigation Incorporated	No	No	No	GEO-4
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	Less Than Significant	No	No	No	None

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
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?	Less Than Significant	No	No	No	None
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	Less Than Significant	No	No	No	CR-2

4.6.1 Discussion

Summary of 2017 MND

Faults and seismic concerns. The 2017 MND identified that the Project location is in an area of relatively high seismic activity. The Garlock fault along the Tehachapi Mountains lies approximately 9 miles north of the Project site. The San Andreas Fault along the San Gabriel Mountains lies approximately 4 miles south of the Project site. None of these fault zones crosses any of the facilities proposed for the Project. The Garlock and San Andreas faults are designated as Fault-Rupture Hazard Zones under the Alquist-Priolo Fault Zoning Act. The Project facilities would not be within any currently designated Fault Rupture Hazard Zones. The general Project area has been subject to intense ground shaking from nearby fault ruptures, particularly on the San Andreas Fault and on faults near the juncture of the San Andreas and Garlock faults. Mitigation measures to ensure facilities would be constructed to withstand earthquakes were identified.

Liquefaction. The MND identified that typically liquefaction potential is a concern when depth to groundwater is about 30 feet but much less when groundwater is at 50 feet. Groundwater depth in the proposed Project area varies, but based on recent measurements groundwater levels in the Project area range from 280 to 300 feet below ground surface. The potential for liquefaction to adversely affect human safety is related to liquefaction potential and the proximity of development to areas of high groundwater. Residential uses exist approximately one-half mile south and approximately 2 miles east of the Project site. Because the Project involves recharge which could raise water levels in the Project vicinity, mitigation measures were identified to reduce potential impacts from liquefaction on the surrounding residences.

Landslides. The Project area is flat and there is no to less than significant impacts from landslides, according to the 2017 MND.

Soil Erosion. The 2017 MND identified that soils of the alluvial plain of the Antelope Valley are highly susceptible to water and/or wind erosion. Erosion could occur typically during grading in periods of winds in excess of about 10 miles per hour, during construction of the berms and during excavation for pipelines.

Some loss of soil could also occur during annual reconstruction of berms. A mitigation measure is required to reduce potential impacts from soil loss to less than significant.

Expansive Soils. The 2017 MND identified that the Project area soils have low or low-to-moderate shrink/swell potential. The same Agency designates the site as having no limitations for site development (building of structures) for about 70% of the site on the southern end of the property and some limitations on the remaining 30% of the land on the northern end. With the exception of construction of some wells, the Agency does not anticipate constructing any permanent structures on the northern end of the property.

Paleontological Resources. This criterion was addressed in the 2017 MND under Section 2.6 Cultural Resources. This criterion was moved to Section VII in the 2019 CEQA Guidelines revisions. Section 2.6 of the 2017 MND identified that the Project has a potential to uncover buried resources and human remains. Mitigation measures were identified to reduce potential impacts to less than significant.

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Faults and seismic concerns. The Project will be constructed in the same location, which is subject to seismic events. Mitigation measures to ensure facilities would be constructed to withstand earthquakes were identified in the 2017 MND. Because the facility will be constructed in the same location with the same seismic event risk, no further mitigation is necessary with the 2021 Revised Project.

Liquefaction. The quantify of the recharged water will be the same as that identified in the 2017 Original MND, so there is the same potential impact to liquefaction by raising water levels in the Project vicinity, as identified with the 2017 MND. Therefore, the mitigation measures identified in the 2017 MND also apply to the 2021 Revised Project and will reduce potential impacts from liquefaction on the surrounding residences

Soil Erosion. Relative to soil erosion potential, the 2021 Revised Project design identifies the use of compacted, engineered berms, unlike the 2017 Original Design in which berms were more loose to naturally trap soil. Berm heights of the original design were approximately 3 feet high whereas berm heights in the revised design are approximately 6 feet high. Therefore, there is similar to less than significant impact to soil erosion during operations for the revised design. As such some loss of soil could also occur during construction of the berms, as identified in the 2017 MND. The mitigation measure identified in the 2017 MND also applies to the 2021 Revised Design to reduce potential impacts from soil loss to less than significant.

Expansive Soils. The 2021 Revised Project design proposes to only construct wells on the Project site, and has eliminated the enclosure for the booster pump station. Therefore, the conditions are similar to the 2017 Original Project design, and no further analysis or mitigation is required.

Paleontological Resources. The Project will be constructed in the same overall location as identified in the 2017 MND. Section 2.6 of the 2017 MND identified that the Project has a potential to uncover buried resources and human remains. Mitigation measures were identified to reduce potential impacts to less than significant, and those mitigation measures are also applicable to the 2021 Revised Project.

4.6.2 Mitigation Measures

The 2017 MND identified the following mitigation measure to reduce impacts to less than significant:

GEO-1 **SWPPP** - To control water and wind erosion during construction and operation of the Project, the Agency will prepare a Stormwater Pollution Prevention Plan (SWPPP) in compliance with the requirements of the National Pollutant Discharge Elimination System (NPDES) Construction General Permit.

GEO-2 **Seismic Design** - Although the proposed Project has little inherent potential for causing seismic safety effects, the Agency will ensure that all facilities are designed to withstand the anticipated seismic forces, consistent with local and State building codes and relevant regulations.

GEO-3 **Pipeline Shut Off Valves -** The Agency will install shut off valves on major pipelines to minimize the potential for flooding during seismic events.

GEO-4 **Groundwater Monitoring Plan -** Although the potential for the Project to raise groundwater levels to within 30 to 50 feet of the ground surface is small, to address potential impacts to local groundwater levels, the Agency will develop a monitoring program to monitor changes in water levels in the area affected by groundwater recharge operations. If monitoring identifies groundwater level rise to 75 feet below ground surface, the Agency will modify management of recharge to prevent water levels from rising to levels where liquefaction effects could occur. The Groundwater Monitoring Plan will also include provisions for monitoring of groundwater quality and the development of a native groundwater quality baseline which would be identified prior to commencement of recharge operations.

CR-2: **Regulation Compliance:** The Agency will comply with Health and Safety Code Section 7050.5, CEQA Section 15064.S(e), and Public Resources Code Section 5097.98, which mandate the process to be followed in the unlikely event of an accidental discovery of any human remains in a location other than a dedicated cemetery.

Revisions to Mitigation Measures:

The 2021 Revised Project Design does not require a modification of the existing measures or the addition of any new measures to reduce impacts to less than significant.

4.6.3 Conclusion

The 2021 Revised Project Design does not change the type or extent of development analyzed in the 2017 MND. Applicable mitigation measures previously identified in the 2017 MND will be required as set forth in the MMRP, and no considerably different mitigation measures that may substantially reduce impacts have been identified or rejected. The 2021 Revised Project Design does not propose substantial changes to geology and soils beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant or more severe geology and

soils impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.7 GREENHOUSE GAS EMISSIONS

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
VIII. GREENHOUSE GAS EMISSIONS: Would the project:					
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	Less Than Significant	No	No	No	None
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	Less Than Significant	No	No	No	None

4.7.1 Discussion

Summary of 2017 MND

The AVAQMD CEQA and Federal Conformity Guidelines have established a significance threshold of 100,000 tons CO2e per year or a daily threshold of 548,000 pounds CO2e where AVAQMD is the lead agency. The 2017 MND identified that heavy duty off road equipment, materials transport, and worker commutes during construction of the Project would result in exhaust related GHG emissions. During operation, direct emissions would result from vehicle trips and area sources. Total construction and operational GHG emissions were estimated in the 2017 MND to be less than the AVAQMD CEQA thresholds, therefore, the impacts were less than significant.

Polices formulated under the mandate of AB 32 and SB 32 that are applicable to construction-related activity, either directly or indirectly, would be implemented during construction of the project if those policies and laws are developed before the commencement of project construction. Therefore, it is assumed that project construction would not conflict with any applicable plans or policies, and the impacts are less than significant.

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The potential greenhouse gas emissions were analyzed in Appendix B. Total construction GHG emissions for the 2021 Revised Project are below both AVAQMD's thresholds of 100,000 MTCO2e per year and 548,000 pounds CO2e per day for all land uses and therefore, the impact is less than significant. The emissions were calculated using Mitigation Measure AQ- 1, which requires the use of off-road construction diesel engines that meet Tier 4 interim California Emission.

There have been no changes to applicable GHG plans and policies since the time of the 2017 MND analysis. Implementation of the 2021 Revised Project would also be required to comply with all applicable plans and policies, as with the 2017 Original Project design. Therefore, there is no change in this analysis.

4.7.2 Mitigation Measures

There were no mitigation measures identified in the 2017 MND, and the 2021 Revised Project Design does not require the addition of any new measures to reduce impacts to less than significant.

4.7.3 Conclusion

The 2021 Revised Project Design does not change the type or extent of development analyzed in the 2017 MND. Implementation of the 2021 Revised Project Design does not propose substantial GHG emissions beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant or more severe GHG impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.8 HAZARDS AND HAZARDOUS MATERIALS

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
IX. HAZARDS AND HAZARDOUS MATERIALS: Would the project:					
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	Less Than Significant With Mitigation Incorporated	No	No	No	HAZ-1
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?	Less Than Significant With Mitigation Incorporated	No	No	No	HAZ-4
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	Less Than Significant	No	No	No	None
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	Less Than Significant	No	No	No	None
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	Less Than Significant With Mitigation Incorporated	No	No	No	HAZ-2 and HAZ-3

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
~~f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?~~	Less Than Significant	(NA - Removed from Guidelines)	NA - Removed from Guidelines)	NA - Removed from Guidelines)	NA - Removed from Guidelines)
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	Less Than Significant	No	No	No	None
g) Expose people or structures, either directly or indirectly to a significant risk of loss, injury or death involving wildland fires? ~~including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?~~	Less Than Significant	No	No	No	None

4.8.1 Discussion

Summary of 2017 MND

The Project is not located near a school or on a hazardous waste site. Additionally, the Project would not interfere with an emergency response plan or expose people or structures to wildland fires. Therefore, the 2017 MND identified that these impacts were less than significant.

During construction and operation of the proposed Project facilities, hazardous materials such as fuels and lubricants will be used and have the potential to be released into the environment, causing environmental and/or human exposure to these hazards. Though given the small quantity and the remote nature of the project area, any effects would be less than significant, although the 2017 MND identified a mitigation measure to ensure less than significant impacts.

Because the recharge basins will retain water, the Project has the potential to attract and breed mosquitos and birds. Mosquitos can carry diseases, and residences are located within one-half mile to the south and approximately 2 miles to the east. As such a mitigation measure was required to reduce potential mosquito breeding.

The Project is also located in an area associated with low level (200 to 1,500 feet) military flight paths for Edwards Air Force Base. The 2017 MND cited a Tulare Lake Drainage District (TLDD) study that found that shorebirds such as avocets and stilts have been found to use the shallow-water (generally 0 to 12 inches in depth with gently sloping upland habitat) created by TLDD in managing its system of drainage ponds.

The shallow-water areas did not attract small birds such as doves and larks. At the same time, deeper ponds were found to be used by a variety of ducks.

The 2017 MND concluded that based on the Project type, the recharge areas will not likely attract larger birds such as ducks, geese, and swans but that there is some potential to attract smaller shorebirds. In the Lancaster Palmdale Edwards Air Force Base area, there were no bird strikes recorded in the National Wildlife Strike Database for ducks, geese, swans, hawks, eagles, vultures, falcons, ravens, or gulls. There was also no bird strikes associated with shorebirds. The database does have records of strikes on pigeons, doves, swifts, larks, and sparrows. This is consistent with Edwards AFB bird/aircraft strike hazard (BASH) data suggesting most bird strikes are of small birds and occur near the runways and during low-altitude flight. As such, the 2017 MND identified measures to minimize potential impacts to Edwards Air Force Base during the recharge operations.

2021 Revised Project Analysis

The Project is in the same location and will be constructed as the original project was analyzed by the 2017 MND. Recharge operations will occur in a variety of basins, as assumed by the 2017 MND, and therefore poses a similar attractant for mosquitos and birds.

4.8.2 Mitigation Measures

The 2017 MND identified the following mitigation measure to reduce impacts to less than significant:

HAZ-1 Spill Prevention Plan - Consistent with Agency's existing practices, the Agency will require from its construction contractors the preparation and implementation of a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities and operations. The plan and methods shall be in conformance with all State and Federal regulations. The Agency shall provide for routine inspection of the construction and operations areas to verify that the measures specified in the SPCCP are properly implemented and maintained and further ensure that contractors are notified immediately if there is a noncompliance issue and will require compliance.

HAZ-2 Bird Strike Hazard Notification - The Agency will notify the Flight Safety Office at Edwards Air Force Base and all local airports of the potential bird strike hazard as follows:

- Prior to application of water to the recharge basins, and
- If large birds or large concentrations of small birds are observed in or near the recharge area.

HAZ-3 Bird Strike Hazard Minimization Measures - The Agency will implement actions to reduce the attractiveness of the recharges basins to birds by:

- Use of recharge basins with shallow water depths which will be generally unsuitable for the larger migratory birds.

- Monitor recharge area water and if aquatic macroinvertebrates are found to be developing in large numbers and/or foraging by shorebirds is observed, temporarily dry out recharge areas, thereby reducing the insect and aquatic macroinvertebrate forage that would attract and hold shorebirds.

- Whenever water is present in the recharge basins, the project operator will monitor the basins daily for bird activity and if found discourage their use via means acceptable to the Department of Fish and Wildlife.

HAZ-4 Mosquito Borne Disease Minimization Measures – The Agency will consult with the Antelope Valley Mosquito and Vector Control District to develop and implement a mosquito management plan. The plan would consist of a Project specific mosquito abatement program that would include quantitative abatement thresholds. The Agency and/or its representative would monitor mosquito larvae production in the recharge basins, drainages, and distribution. Larvae populations would be tracked using methods and thresholds approved by the Mosquito Abatement District, and suppression measures would be employed when thresholds are exceeded. The primacy mode of suppression would be to monitor for mosquito presence and if mosquito larvae are found, to cycle recharge temporarily so that units of recharge would be dried.

Revisions to Mitigation Measures:

The 2021 Revised Project Design does not require a modification of the existing measures or the addition of any new measures to reduce impacts to less than significant.

4.8.3 Conclusion

The 2021 Revised Project Design does not change the type or extent of development analyzed in the 2017 MND. Applicable mitigation measures previously identified in the 2017 MND will be required as set forth in the MMRP, and no considerably different mitigation measures that may substantially reduce impacts have been identified or rejected. The 2021 Revised Project Design does not propose substantial changes to hazards and hazardous materials beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant or more severe hazards or hazardous materials impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.9 HYDROLOGY AND WATER QUALITY

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
X. HYDROLOGY AND WATER QUALITY: Would the project:					
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	Less Than Significant With Mitigation Incorporated	No	No	No	HWQ-4
b) Substantially ~~deplete~~ decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin ~~there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)~~?	Less Than Significant With Mitigation Incorporated	No	No	No	HWQ-4
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner which would:	Less Than Significant With Mitigation Incorporated (also applies to all subcriteria)	No (also applies to all subcriteria)	No (also applies to all subcriteria)	No (also applies to all subcriteria)	HWQ-1, HWQ-2, HWQ-3, HWQ-5 (also applies to all subcriteria)
• result in substantial erosion or siltation onsite or offsite;					
• substantially increase the rate or amount of surface water runoff in a manner which would result in flooding on or offsite;					

Environmental Subject Area	**Conclusion in 2017 MND**	**Do the Proposed Changes Involve New or More Severe Impacts?**	**New Circumstances Involving New or More Severe Impacts?**	**New Information Requiring New Analysis or Verification?**	**Mitigation Measures**
• create or contribute to runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or					
• impede or redirect flood flows?					
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	Less Than Significant	No	No	No	None
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	Less Than Significant	No	No	No	None
~~d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?~~	Refer to Criterion X(c)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)
~~e) 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?~~	Refer to Criterion X(c)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)
~~f) Otherwise substantially degrade water quality?~~	Refer to Criterion X(a)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)
~~g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?~~	Refer to Criterion X(c)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
~~h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?~~	Refer to Criterion X(c)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)
~~i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?~~	Refer to Criterion X(c)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)
~~j) Inundation by seiche, tsunami, or mudflow?~~	Refer to Criterion X(c)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)

4.9.1 Discussion

Summary of 2017 MND

Water Quality. The 2017 MND identified that the SWP water would be blended with the regional groundwater as it is absorbed into the ground. Based on various testing data, both recharged water and indigenous water are generally suitable for drinking water purposes. Considering that the blending of the indigenous and SWP water supplies is not likely to change the water quality significantly such that it would result in concentrations above the Maximum Contaminant Levels (MCLs), operations related to groundwater recovery and delivery of the recovered water back to the California Aqueduct are not anticipated to cause any adverse impact. No external treatment system is needed for either the SWP supply or the groundwater. The 2017 MND identified that the Agency will work with and comply with DWR's requirements in the development and implementation of a pump in program including monitoring of water quality of water being pumped into the Aqueduct.

The 2017 MND identified that recharge operations have the potential to raise groundwater levels to where it may interfere with the few septic systems in the surrounding. Mitigation was implemented to monitor and change recharge operations as necessary to maintain the groundwater level below 75 ft. (100 ft is the level considered a greater risk of nitrate contamination).

Groundwater Supplies and Recharge: The 2017 MND identified that groundwater recharge will generally raise groundwater levels when compared to no project conditions and will benefit adjacent private well owners by reducing the cost of pumping supplies. The 2017 MND also identified that the Agency's recovery operations during drought may result in lower water levels in nearby wells and localized declines in water levels may reduce well production somewhat and raise well pumping costs. Mitigation was required to ensure that net extractions of groundwater by the Agency and its partners will not exceed 90 percent of the volume of water recharged.

Change in Drainage Patterns. The Project site has seven major tributary streams. The slope of the land in the vicinity of project drains from southwest to east. The Project would preserve existing topography and not significantly alter existing drainage patterns.

The 2017 MND identified that "a typical recharge program, involving the construction of large, permanent berms to retain flow would result in a significant change in the drainage patterns in the area and in particular would preclude flood flows from passing through the recharge area, thus diverting flows to adjacent properties." The 2017 Original project design proposed not to isolate the site from flood flows but, instead, the design would utilize flood irrigation methods to where only temporary berms of not greater than about 36 inches in height would be installed to retain some stormwater for recharge, but in general, be sacrificial, or wash away, to mimic natural flood conditions. Drainage flows would enter the recharge area, temporarily be constrained by the low berms, and then overtop and flow from one berm to the next until breaching the last berm on the eastern end of the property. A beneficial effect of the sacrificial berms was identified as that it would temporarily detain flood flows, allow for some percolation of these flows into the ground, and then allow flow to exit the site in a manner similar to pre-project conditions. Berms will also retain and recharge low flow storm runoff.

Consistency with Groundwater Plans. The 2017 MND identified that the Project (a) does not affect the beneficial use of the stored supplies, at any blend of SWP and indigenous groundwater and (b) has somewhat greater benefits than adverse impacts associated with mass loading of minerals as the concentration (mg/l) in the blended water is such that it does not change the intended beneficial use of the water.

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Water Quality. The SWP water would still be blended with the regional groundwater as it is absorbed into the ground, and there is no change to this feature. The 2017 MND identified that the SWP and the regional groundwater are compatible, and neither need treatment. A rise in groundwater is also anticipated with the revised project design, and operations will be adjusted as needed based on monitoring as with the original design. Therefore, there is no change.

Groundwater Supplies and Recharge: The recharge operations will also generally raise groundwater levels when compared to no project conditions, creating the same benefit of reduced pumping costs for adjacent private well owners. Additionally, the Agency's recovery operation during drought may also result in lower water levels in nearby wells and localized declines in water levels may reduce well production somewhat and raise well pumping costs. Mitigation was required to reduce potential impacts to adjacent private wells, and the revised design incorporates the monitoring requirement.

Change in Drainage Patterns. The Project site has seven major tributary streams. The 2017 MND identified that "a typical recharge program, involving the construction of large, permanent berms to retain flow would result in a significant change in the drainage patterns in the area and in particular would preclude flood flows from passing through the recharge area, thus diverting flows to adjacent properties." The 2021 Revised Project Design constitutes a "typical recharge program…" as described by the 2017 MND.

However, a Drainage Evaluation was prepared for the 2021 Revised Project Design (Appendix E) that further defined flood flow across the Project site. The revised design focuses the fixed basins outside of

the areas where storm flows are heaviest and provides protection for some of the basins, removing the sacrificial nature of the basins. As such, the basin placement throughout the Project area are designed in a manner that will still allow the main flood flows to pass through the Project area, continuing in normal patterns, and not divert flows onto adjacent properties.

The 2021 Revised Project Design constitutes a hybrid recharge program with some "typical" basins and some sacrificial basins. A Drainage Evaluation was prepared for the 2021 Revised Project Design (Appendix E) that defined flood flow across the Project site. The revised design focuses the fixed basins outside of the areas where storm flows are heaviest and provides protection for these basins, removing the sacrificial nature of these basins. Basins within the floodways will remain as sacrificial as intended in the original design. As such, the basin placement throughout the Project area is designed in a manner that will still allow the main flood flows to pass through the Project area, continuing in normal patterns, and not divert flows onto adjacent properties. Flood flows will still enter the sacrificial berm area, recharge during small storm events, and overtop the berms in larger storm events. Sheet flows will likely not enter the flood protected basins.

Consistency with Groundwater Plans. The 2017 MND identified that the Project (a) does not affect the beneficial use of the stored supplies, at any blend of SWP and indigenous groundwater and (b) has somewhat greater benefits than adverse impacts associated with mass loading of minerals as the concentration (mg/l) in the blended water is such that it does not change the intended beneficial use of the water.

4.9.2 Mitigation Measures

The 2017 MND identified the following mitigation measure to reduce impacts to less than significant:

HWQ-1 **Drainage Design** - Recharge areas will be constructed so that they will not divert sheet flooding and other runoff away from the recharge areas. This will allow flood water to flow into the recharge areas where flows will be somewhat retarded by the recharge berms. Berms will be designed with berm heights below the calculated flood depth elevations and intended to be sacrificial. Flood flows would enter the site, go through the berms, overtop or destroy the berms in sequence, and eventually exit the project site along the eastern boundary of the proposed project in a manner similar to pre-project conditions.

HWQ-2 **Stormwater Pollution Prevention Plan (SWPPP)** - To reduce or eliminate Construction related water quality effects, before onset of any construction activities, the Agency or its contractor will prepare a Storm Water Pollution Prevention Plan. The SWPPP will include temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover). These measures will be employed to control erosion from disturbed areas. Measures for the control of pollutants during construction include:

- Use of existing access points to minimize dust and tracking materials onto Public Streets,

- Designated Parking, Storage, and Service Areas protected by silt fence and oil absorbents and sloped to control drainage,
- Minimize diesel storage,
- Stockpile spill cleanup materials,
- Regular vehicle inspection for leaks.
- Fuel off-channel with a secondary containment system for spills,
- Use quick connects whenever possible,
- Fueling by authorized personnel only, and
- Spill cleanup materials readily available.

The SWPPP shall include a Fugitive Dust Control Plan (FDCP) that will include extensive measures to control and manage soil erosion. The FDCP will provide for management of open soils that will contribute to management of runoff.

Consistent with the SWPPP and the Agency's current construction management practices, the Agency or its agent will perform routine inspections of the construction area to verify that the BMPs specified in the SWPPP are properly implemented and maintained. The Agency will notify its contractors immediately if there is a noncompliance issue and will require compliance.

HWQ-3 **Spill Prevention Plan** - Consistent with Agency's existing practices, the Agency will require from its construction contractors the preparation and implementation of a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities and operations. The plan and methods shall be in conformance with all State and Federal regulations. The Agency shall provide for routine inspection of the construction and operations areas to verify that the measures specified in the SPCCP are properly implemented and maintained and further ensure that contractors are notified immediately if there is a noncompliance issue and will require compliance.

HWQ-4 **Protection of Off Site Wells**. To address potential impacts to groundwater and adjacent well owners, the Agency will develop a monitoring program to monitor changes in water levels and well production in the area affected by groundwater recharge operations. The program will specify that:

- Extractions of groundwater shall not exceed 90% of the amount of water recharged,
- Water quality in recovered water and in groundwater flowing away from the Project will be monitored to ensure that water quality remains appropriate for designated beneficial uses,

- During recharge operations, water levels will be monitored and recharge operations will be suspended in the event that offsite water levels rise to within 75 feet of the ground surface, and

- During recovery operations, water levels in offsite wells will be monitored and operations will be adjusted if offsite wells are found to be adversely affected by project operations,

HWQ-5 **Management of Herbicides and Pesticides** - The Agency will comply with all regulations of the California Department of Pesticide Regulation regarding the use of herbicides and pesticides in areas designated for groundwater recharge.

Revisions to Mitigation Measures:

Due to the design change, the following mitigation measure is revised/clarified:

HWQ-1 Recharge areas in Pescado Creek and Oso Canyon floodways will be constructed so that they will not divert sheet flooding and other runoff away from the low, earthen berms that will be constructed within the creek areas that will be used to enhanced the fixed recharge areas. This will allow flood water to flow into the creek areas ~~recharge areas~~ where flows will be somewhat retarded by the recharge berms. Berms will be designed with berm heights below the calculated flood depth elevations and intended to be sacrificial. Flood flows would enter the site, be primarily channeled through the floodways go through the berms that are installed within the floodways, overtop or destroy the berms in sequence, and eventually exit the project site along the eastern boundary of the proposed project in a manner similar to pre-project conditions.

The intent of this mitigation measure was that storm flow/flood flow be channeled throughout the entire 1,200 acre site, including Pescado Creek and Oso Canyon floodways, would mimic agricultural type flooding, and the same amount of flow that enters the site would also exit the project site. However, during final design, it was discovered that the same berms that were designed to hold SWP water recharge would be sacrificed in a flooding event, thereby potentially significantly increasing the amount of water that would be exiting the project site. The 2021 Revised Design channels the flood flow in a manner that protects the water recharge areas, therefore, the same amount of water would enter and exit the project site. The sacrificial berms that will be placed within the Pescado Creek and Oso Canyon floodway serve to not only retard flows but also attempt to provide additional recharge opportunities. These sacrificial berms would be restored after the flood event. Therefore, the modification required to HWQ-1 to reflect the current design also meets the intent of the original HWQ-1 in that it ensures no additional flows exit the site and in a manner that is similar to pre-project conditions.

Other than a modification to HWQ-1 which is consistent with the intent of the original HWQ-1, the 2021 Revised Project Design does not require a modification of any of the other existing measures or the addition of any new measures to reduce impacts to less than significant.

4.9.3 Conclusion

The 2021 Revised Project Design does not change the type or extent of development analyzed in the 2017 MND. Applicable mitigation measures previously identified in the 2017 MND will be required as set forth in the MMRP, and no considerably different mitigation measures that may substantially reduce impacts have been identified or rejected. The 2021 Revised Project Design does not propose substantial changes to hydrology and water quality materials beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. The modifications made to mitigation measure HWQ-1 are clarifications and as relevant to the 2021 Revised Project and are not significant. Therefore, the 2021 Revised Project Design would not involve new significant or more severe hydrology and water quality materials impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.10 NOISE

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
XIII. NOISE: Would the project result in:					
a) ~~Exposure of persons to or g~~ Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	Less Than Significant With Mitigation Incorporated	No	No	No	NOISE-1, NOISE-2
b) ~~Exposure of persons to or g~~ Generation of excessive groundborne vibration or groundborne noise levels?	Less Than Significant With Mitigation Incorporated	No	No	No	NOISE-1, NOISE-2
~~c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project~~	Refer to Criterion XIII(a)	(N/A – Guidelines Revised	(N/A – Guidelines Revised	(N/A – Guidelines Revised	(N/A – Guidelines Revised
~~d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?~~	Refer to Criterion XIII(a)	(N/A – Guidelines Revised	(N/A – Guidelines Revised	(N/A – Guidelines Revised	(N/A – Guidelines Revised
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	No Impact	No	No	No	None
~~f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?~~	Refer to Criterion XIII(c)	(N/A – Guidelines Revised	(N/A – Guidelines Revised	(N/A – Guidelines Revised	(N/A – Guidelines Revised

4.10.1 Discussion

Summary of 2017 MND

The Project area is surrounded by undeveloped land. There are about 7 isolated residential homes near the eastern boundary of the Project. There are two rural residential developments near the project area. One is located about 1/2-mile south of the California Aqueduct and the second one consisting of the community of Neenach is located about 2 miles east of the Project's eastern boundary. There are no existing sources of excessive noise in the area. Highway traffic is sparse, and many of the local roads are unpaved. Traffic noise is not a current problem. With the exception of seasonal exposure to noise of agricultural operations, ambient noise levels in the area are typical of rural areas.

Construction and operations of the Project may exceed the Los Angeles County threshold of 75 dBA during day time hours during various activities for less than 5 residences abutting the eastern boundary of the project area, in the vicinity of 280th St. West. Berm construction and maintenance would involve the use of a typical agricultural tractor and or a small scraper and water truck. Noise associated with berm construction would not differ from the noise associated with agricultural operations. However, mitigation measures were identified to ensure construction and operations noise would be less than significant.

2021 Revised Project Analysis

The Project is located in the same area as assessed in the 2017 MND. Construction and operations noise from the revised Project also has the potential to impact residents in the southeastern portion of the site, in the vicinity of 280th St. West. And though recharge basins are proposed for the southeastern portion of the site under the revised design and were not proposed in the original design, mitigation measures were imposed that would ensure construction and operations noise remained less than significant. These measures are applicable to the revised design.

4.10.2 Mitigation Measures

The 2017 MND identified the following mitigation measure to reduce impacts to less than significant:

NOISE-1 Construction Noise Monitoring and Minimization Measures – The Agency and its construction contractors will monitor noise levels for construction activities near and along 280th Street West corresponding to the eastern boundary of the proposed Project area which includes potential noise receptors (residential homes). In the event that noise levels exceed the County of Los Angeles designated thresholds, the construction contractor will implement noise reduction measures to include:

- Providing construction equipment with sound control devices.
- With the exception of well drilling operations, restrict construction activities to day time hours.
- In the event that construction activities occur close to sensitive noise receptors, implementing appropriate additional noise mitigation measures, including but not limited to:
    - Changing the location of stationary construction equipment,

- Shutting off idling equipment,
- Rescheduling construction activity
- Notifying adjacent residents in advance of construction work, and
- Installing acoustic barriers around stationary construction noise sources.

NOISE-2 Operation Noise Minimization Measures – The Agency proposes to construct approximately 7 groundwater wells in the vicinity of 280th St. West which have the potential to increase the ambient noise level for the nearby residential homes on the east side of 280th St. West during groundwater recovery operations. The Agency proposes to equip these wells with insulated well enclosures that will reduce the operational noise level in the area to less than significant.

Revisions to Mitigation Measures:

Due to the design change, the following mitigation measure is revised/clarified:

NOISE-2 Operation Noise Minimization Measures – The Agency proposes to construct approximately ~~7~~ 6 groundwater wells in the vicinity of 280th St. West which have the potential to increase the ambient noise level for the nearby residential homes on the east side of 280th St. West during groundwater recovery operations. The Agency proposes to equip these wells with insulated well enclosures that will reduce the operational noise level in the area to less than significant.

The intent of this mitigation measure was to ensure monitoring along the area of 280th Street West, which have nearby residents. The 2021 Revised Design reduces the number of wells to six, form the seven originally proposed, along 280th Street West. Therefore, the modification required to Noise-2 to reflect the current design also meets the intent of the original Noise-2 in that it ensures noise monitoring for the wells along a potentially sensitive residential area.

Other than a modification to Noise-2 which is consistent with the intent of the original Noise-2, the 2021 Revised Project Design does not require a modification of any of the other existing measures or the addition of any new measures to reduce impacts to less than significant.

4.10.3 Conclusion

The 2021 Revised Project Design does not change the type or extent of development analyzed in the 2017 MND. Applicable mitigation measures previously identified in the 2017 MND will be required as set forth in the MMRP, and no considerably different mitigation measures that may substantially reduce impacts have been identified or rejected. The 2021 Revised Project Design does not propose substantial changes to noise levels beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant or more severe noise impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.11 TRANSPORTATION

It should be noted that there were no significant transportation or traffic impacts or mitigation identified in the 2017 MND, and the 2021 Revised Project has similar traffic characteristics as the 2017 Original Project. However, there were significant revisions to the Transportation section of the Guidelines, and therefore, this Environmental Subject Area is included for completeness of this Addendum.

Environmental Subject Area	**Conclusion in 2017 MND**	**Do the Proposed Changes Involve New or More Severe Impacts?**	**New Circumstances Involving New or More Severe Impacts?**	**New Information Requiring New Analysis or Verification?**	**Mitigation Measures**
XVII. TRANSPORTATION~~/TRAFFIC~~: Would the project:					
a) Conflict with a~~n applicable~~ program plan, ordinance or policy ~~establishing measures of effectiveness for the performance of~~ addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?~~taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?~~	Less Than Significant	No	No	No	None
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)~~(1)~~? ~~Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?~~	Not Analyzed No Impact	No	No	No	None
~~c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?~~	Less Than Significant With Mitigation Incorporated	N/A – Removed from Guidelines, Refer to Section IX(e)	N/A – Removed from Guidelines, Refer to Section IX(e)	N/A – Removed from Guidelines, Refer to Section IX(e)	HAZ-2, HAZ-3

c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	No Impact	No	No	No	None
d) Result in inadequate emergency access?	No Impact	No	No	No	None
~~f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?~~	Refer to Criterion XVII(a)				

4.11.1 Discussion

This Environmental Subject Area underwent major revisions since the adoption of the 2017 MND. While most of the revisions represent combining multiple individual criterion into single criterions for evaluation, the major revision was to Criterion XVII(b). CEQA Guidelines Section 15064.3 provides that transportation impacts of projects are, in general, best measured by evaluating the project's vehicle miles traveled (VMT). Automobile delay (often called Level of Service) will no longer be considered as an environmental impact under CEQA, which is reflected in this revised criterion.

The Los Angeles County Public Works Transportation Impact Analysis Guidelines (July 23, 2020) sets forth the criteria for evaluating VMT. Based on the County's Guidelines, the High Desert Water Bank is exempt from having to prepare a VMT analysis, both under the 2017 Original Project Design and the 2021 Revised Project Design because the Project is neither a "development" nor "transportation" project – meaning the Project does not add habitable structures or population.

An excerpt from the County's Guidelines is as follows:

> *Public Works generally will require the preparation and submission of a Transportation Impact Analysis for projects that meet the following criteria:*
>
> - *Development Projects:*
> - *Estimated to generate a net increase of 110 or more daily vehicle1 trips.*
>
> - *Transportation Projects:*
> - *Likely to induce additional vehicle1 miles traveled (VMT) by increasing vehicle capacity.*
>
> - *Projects for which a Transportation Impact Analysis is required by County ordinance; regulation; resolution; court order; or directive from the Board of Supervisors, Regional Planning Commission.*
>
> *A Transportation Impact Analysis requires analyses and forecasting of impacts or deficiencies to the circulation system generated by the project. The Transportation Impact Analysis identifies feasible measures or corrective conditions to offset any impacts or deficiencies.*

Therefore, no further analysis is required.

4.11.2 Mitigation Measures

There were no mitigation measures identified in the 2017 MND, and the 2021 Revised Project Design does not require the addition of any new measures to reduce impacts to less than significant.

4.11.3 Conclusion

The 2021 Revised Project Design does not change the type or extent of development analyzed in the 2017 MND. Implementation of the 2021 Revised Project Design does not propose substantial transportation changes beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant transportation impacts or more severe transportation impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.12 TRIBAL CULTURAL RESOURCES

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
XVIII. TRIBAL CULTURAL RESOURCES: Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:					
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	Less Than Significant With Mitigation Incorporated	No	No	No	TCR-1
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	Less Than Significant With Mitigation Incorporated	No	No	No	TCR-1

4.12.1 Discussion

Summary of 2017 MND

The 2017 MND identified that records search and field surveys did not find the existence of tribal cultural resources. Unknown buried cultural resources may possibly be affected by the Project, however, the incorporation of management and monitoring protocols will reduce this to less than significant.

2021 Revised Project Analysis

The Project occurs in the same location as analyzed by the 2017 MND. No new analysis is required.

4.12.2 Mitigation Measures

The 2017 MND identified the following mitigation measure to reduce impacts to less than significant:

TCR-1: Inadvertent Finds –

1. If human remains or funerary objects are encountered during any activities associated with the project, work in the immediate vicinity (within a 100-foot buffer of the find) shall cease and the County Coroner shall be contacted pursuant to State Health and Safety Code §7050.5 and that code enforced for the duration of the project.

2. In the event that Native American cultural resources are discovered during project activities, all work in the immediate vicinity of the find (within a 60-foot buffer) shall cease and a qualified archaeologist meeting Secretary of Interior (SOI) standards shall be hired to assess the find. Work on the other portions of the project outside of the buffered area may continue during this assessment period. Additionally, San Manuel Band of Mission Indians will be contacted if any such find occurs and be provided information and permitted/invited to perform a site visit when the archaeologist makes his/her assessment, so as to provide Tribal input.

3. If significant Native American historical resources, as defined by CEQA (as amended, 2015), are discovered and avoidance cannot be ensured, an SOI-qualified archaeologist shall be retained to develop a cultural resources Treatment Plan, as well as a Discovery and Monitoring Plan, the drafts of which shall be provided to San Manuel Band of Mission Indians for review and comment.

    a. All in-field investigations, assessments, and/or data recovery enacted pursuant to the finalized Treatment Plan shall be monitored by a San Manuel Band of Mission Indians Tribal Participant(s).

    b. The Lead Agency and/or applicant shall, in good faith, consult with San Manuel Band of Mission Indians on the disposition and treatment of any artifacts or other cultural materials encountered during the project.

Revisions to Mitigation Measures:

The 2021 Revised Project Design does not require a modification of the existing measures or the addition of any new measures to reduce impacts to less than significant.

4.12.3 Conclusion

The 2021 Revised Project Design does not change the type or extent of development analyzed in the 2017 MND. Applicable mitigation measures previously identified in the 2017 MND will be required as set forth in the MMRP, and no considerably different mitigation measures that may substantially reduce impacts have been identified or rejected. The 2021 Revised Project Design does not propose substantial changes to tribal cultural resources beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant or more severe tribal cultural resource impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.13 UTILITIES AND SERVICE SYSTEMS

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
XIX. UTILITIES AND SERVICE SYSTEMS: Would the project:					
~~a)Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?~~	No Impact	(N/A – Removed from Guidelines)	(N/A – Removed from Guidelines)	(N/A – Removed from Guidelines)	(N/A – Removed from Guidelines)
a) Require or result in the relocation or construction of new or expanded water, or wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities ~~or expansion of existing facilities~~, the construction or relocation of which could cause significant environmental effects?	Less Than Significant With Mitigation Incorporated	No	No	No	UTIL-1
~~b) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?~~	No Impact	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years ~~from existing entitlements and resources, or are new or expanded entitlements needed~~?	Less Than Significant	No	No	No	None
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?	Less Than Significant	No	No	No	None
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? ~~Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs~~?	Less Than Significant	No	No	No	None

e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	Less Than Significant	No	No	No	None

4.13.1 Discussion

Summary of 2017 MND

The proposed Project site is currently undeveloped and is not served by public water, wastewater, stormwater, and solid waste collection facilities, and the nature of the Project to store water does not require those services.

Domestic water is provided to the surrounding residences by private groundwater wells. Irrigation water for farming is provided by irrigation groundwater wells and or surface water from the California Aqueduct. Wastewater disposal is managed through the use of septic systems. The nearest landfill (Kern County Landfill) is located about 20 miles west of the project. There are no oil and gas facilities known to occur in the proposed Project area. Powerlines run through the southern boundary of the proposed Project area on the north side of the California Aqueduct Right of Way.

The proposed Project consisting of storing surface water during wet weather year periods and recovering the stored water during dry weather year periods will not require an expansion of the capacity of the California Aqueduct and its pumping facilities which is the source for recharge operations and the point of delivery for recovery operations. Recharge and recovery operations will stay within the capacity of the California Aqueduct and the Agency and its partners capacity allocations.

The proposed Project would utilize electric water pumps that are anticipated to be served off the existing grid system running along the southern boundary of the proposed Project. This new electric demand may require the expansion of the existing power grid to meet the new power demands of the proposed project. Additionally, new electric lines would be required to connect the various well pumps and pump station to the existing grid. A mitigation measure was identified to minimize any impacts associated with electrical line/grid expansion that may be required to connect the various wells and pump station to the existing electrical grid.

2021 Revised Project Analysis

The Revised Project Design also does not require water, wastewater or solid waste services beyond minimal, occasional services during construction and operations. As with the original design, the revised design also requires that electricity be brought to the site to service the wells.

4.13.2 Mitigation Measures

The 2017 MND identified the following mitigation measure to reduce impacts to less than significant:

UTIL-1: **Electrical Service Upgrade Minimization Measures –** In the event that the existing electrical grid system needs to be expanded to meet the proposed project demands, the Agency will require that the Electric Company comply with all mitigation measures identified in this Initial Study during the construction of the expansion.

Revisions to Mitigation Measures:

The 2021 Revised Project Design does not require a modification of the existing measures or the addition of any new measures to reduce impacts to less than significant.

4.13.3 Conclusion

The 2021 Revised Project Design does not change the type or extent of development analyzed in the 2017 MND. Applicable mitigation measures previously identified in the 2017 MND will be required as set forth in the MMRP, and no considerably different mitigation measures that may substantially reduce impacts have been identified or rejected. The 2021 Revised Project Design does not propose substantial changes to utilities and service systems beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant or more severe utilities and service systems impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.14 WILDFIRE

Environmental Subject Area	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
XX. WILDFIRE: If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, Would the project:					
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	Not Analyzed No Impact	No	No	No	None
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 wildfire?	Not Analyzed No Impact	No	No	No	None
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?	Not Analyzed No Impact	No	No	No	None
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?	Not Analyzed No Impact	No	No	No	None

4.14.1 Discussion

An analysis of the wildfire risk was not required by the CEQA Guidelines at the time the 2017 MND was prepared. Therefore, the wildfire risk was not analyzed as part of the 2017 MND. However, the wildfire risk was known at the time of the 2017 MND and is covered briefly by Guidelines Criterion IX(g) which evaluates a Project's potential hazard to expose people and structures to wildfire.

This Environmental Subject Area is applicable if the Project is "located in or near state responsibility areas or lands classified as very high fire hazard severity zones."

The CalFire Fire Hazard Severity Zone Map viewer indicates that the Project area is located in a "Moderate" fire hazard zone. The Project site and the surrounding area is flat, and the areas adjacent to the Project are either vacant or sparsely populated with rural residential.

The potential impacts of this Environmental Subject Area is the same for both designs because the Project location is the same for both designs.

4.14.2 Mitigation Measures

No mitigation measures were required for are required for the 2017 Original Project Design had wildfire resources been evaluated in the 2017 MND beyond Guidelines Criterion IX(g). The 2021 Revised Project Design also does not require the addition of any measures to reduce impacts to less than significant.

4.14.3 Conclusion

The proposed Project does not change the type or extent of development analyzed in the 2017 MND. Implementation of the 2021 Revised Project Design does not propose substantial wildfire risks beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. Therefore, the 2021 Revised Project Design would not involve new significant wildfire impacts or more severe wildfie impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

4.15 MANDATORY FINDINGS OF SIGNIFICANCE

ENVIRONMENTAL IMPACTS	Conclusion in 2017 MND	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures Identified in Environmental Subject Areas
XXI. MANDATORY FINDINGS OF SIGNIFICANCE:					
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	Less Than Significant With Mitigation Incorporated	No	No	No	Biological Resources, Cultural Resources, Tribal Cultural Resources
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	Less Than Significant With Mitigation	No	No	No	Agricultural Resources, Air Quality, Geology/Soils, Hazards and Hazardous Materials, Hydrology and Water Quality, Noise, Utilities and Services
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	Less Than Significant With Mitigation Incorporated	No	No	No	Noise

4.15.1 Discussion

Summary of 2017 MND

The 2017 MND identified that implementation of the proposed Project could potentially result in impacts to sensitive species. The Project also may potentially result in impacts to unknown cultural resources. Any degradation of the quality of the environment would be reduced to below a level of significance through implementation of the mitigation measures identified in the respective sections of this Initial Study.

Cumulative impacts are considered as two or more individual project effects that, when considered together with other projects combine to result in a significant impact within an identified region. In order for a project to contribute to cumulative impacts, it must result in some level of impact on a project specific level. For the most part the proposed Project will cause no impact to aesthetics, land use and planning, mineral resources, population and housing, public services, recreation, and transportation and traffic.

Potential regional cumulative effects were considered for the topics of agricultural and forest, air quality, biological, cultural, greenhouse gas, geology and soils, hazards and hazardous conditions, hydrology and water quality, noise, and utilities and service systems for which the project was found to result in less than significant impacts with mitigation.

With the exception of noise impacts to adjacent residences, the project would not consist of any use or activities that would negatively affect any persons in the vicinity. Mitigation measures identified in this Initial Study, would reduce noise impacts to less than significant levels.

2021 Revised Project Analysis

The potential impacts to sensitive species and unknown cultural resources of the 2021 Revised Project were similar to that of the 2018 Original Project. No further analysis is required.

The Project purpose is the same, and the Project occurs in the same location as analyzed by the 2017 MND. Therefore, there is no change to the cumulative impacts identified in the 2017 MND.

With the exception of noise impacts to adjacent residences, the 2021 Revised Project analysis identified that the Project would not consist of any use or activities that would negatively affect any persons in the vicinity. Mitigation measures identified in the 2017 MND, would reduce noise impacts to less than significant levels under the 2021 Revised Project.

4.15.2 Mitigation Measures

The 2017 MND identified mitigation measure to reduce impacts to less than significant. The 2021 Revised Project Design Analysis did not identify a significant modification of the existing measures or the addition of any new measures to reduce any impact to less than significant.

4.15.3 Conclusions

The 2017 MND identified that all resource topics associated with the Project were analyzed in accordance with State CEQA Guidelines and found to pose no impact, less than significant impact, or less than significant impact with mitigation. Consequently, the Project would not result in any environmental effects that would cause substantial adverse effects on human beings directly or indirectly; therefore, the impact would be less than significant.

This Addendum evaluated the 2021 Revised Project Design and all relative resource topics associated with the Project were analyzed in accordance with State CEQA Guidelines. The 2021 Revised Project Design

does not propose substantial changes beyond those analyzed in the 2017 MND or require major revisions to the 2017 MND. As explained in the checklists and supporting analysis above, none of the conditions listed in CEQA Guidelines Section 15162 are triggered by the 2021 Revised Project Design. Therefore, the 2021 Revised Project Design would not involve new significant impacts or more severe impacts than those previously identified and analyzed in the 2017 MND. No additional analysis or mitigation measures are required.

Appendix A
Mitigation Monitoring and Reporting Program

Antelope Valley – East Kern Water Agency

High Desert Water Bank

California Environmental Quality Act (CEQA)

Mitigated Negative Declaration

SCH No. 2017061030

Mitigation Monitoring and Reporting Program

December 2017

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1. General

The Mitigated Negative Declaration (MND) for the Antelope Valley – East Kern Water Agency (AVEK or Agency) High Desert Water Bank (the Project) specified a number of mitigation measures to be undertaken during implementation of the proposed project. During implementation, it is essential that all of these be fully complied with and that compliance be documented in a timely manner. Failure to comply with and or document compliance could result in a challenge to the project that could result in project delays.

This Mitigation Monitoring and Reporting Program (MMRP) has been prepared for the project and has been adopted concurrently with the findings of the Initial Study and Mitigated Negative Declaration. This plan is intended to track compliance of all of the mitigation measures adopted with the Mitigated Negative Declaration.

2. Responsibility for Compliance and Documentation

Implementation of the MMRP will be the responsibility of the Agency. The Agency will assign a project manager to oversee all aspects of implementation of the proposed project and ensure that the mitigation and monitoring commitments made in the MND are carried out in a timely and effective manner. In implementing the MMRP, the Agency will often rely on the expertise of outside consultants and contractors. To ensure the effectiveness of this mitigation and monitoring, the Agency will:

- Make the MMRP an element of all project-related requests for proposals and contract specifications, specifying that construction contractors will be responsible for appropriate acquisition of permits for construction and implementation of relevant mitigation and monitoring elements, as specified in this MMRP;
- Independently review contractor compliance on a regular basis and require corrective actions in a timely manner when the Agency determines that such actions are required;
- Maintain files, open to the public for inspection, documenting compliance with the MMRP;
- Designate an Agency staff member to receive and respond to all public and Agency comments, complaints, and/or questions regarding compliance with the MMRP; and
- Provide regulatory agencies with appropriate and timely documentation of compliance as specified in regulatory permits issued for the proposed project.

Additionally, the Agency will require that construction contractors designate a principal mitigation and monitoring manager (Principal) and back-up mitigation and monitoring manager (Alternate) and shall ensure that at least one of these is on-site during all phases of construction. These persons may perform other tasks, but shall have adequate time, training, and expertise to perform the required monitoring and documentation. The Principal shall be the contractor's construction field supervisor or assistant field supervisor. The Principal or Alternate shall independently verify compliance with required mitigation measures and shall indicate verification by filling out and signing the appropriate compliance checklist, thereby certifying compliance with all measures.

3. Permits and Coordination

The MND identifies a number of permits which may need to be obtained for various aspects of the Proposed Project, as well as commitments to coordinate design, pre-construction, and

construction activities with various local, regional, State, and Federal agencies. Permits and coordination commitments are:

- Encroachment Permits for any work within Public Right of Way.
- National Pollutant Discharge Elimination System Construction Activities General Permit.
- Department of Water Resources Turnout Construction and Operations Permit.
- Department of Water Resources Encroachment Permit (if needed)
- Caltrans heavy or oversized equipment Transportation Permit (if needed).

4. Incidents and Compliance Reporting

Timely reporting of compliance and of any incidents which may result in non-compliance is essential. Contracts for construction and for independent compliance contractors shall therefore specify that, if the designated construction contractor for an activity determines that any aspect of construction is not in substantive compliance with the mitigation requirements for the activity, the contractor shall immediately take action to remedy the problem. The designated Principal or Alternate shall notify the Agency within not more than 24 hours following determination that any aspect of construction activity is not in compliance with mitigation requirements, shall explain how the incident has been addressed, and shall provide any other information requested by the Agency. Following action to address the out-of-compliance incident, the designated Principal or Alternate must complete an "incident report" and submit a copy of the report to the Agency's project manager within one week of the incident.

5. Mitigation and Monitoring Program Update

The Agency recognizes that laws, regulations, and policies related to construction activities may change during construction. The Agency's project manager is responsible for periodically reviewing the status of laws, regulations, and guidelines applicable to their construction activity. The Agency will implement any new rules in effect at the time of approval.

6. Staff Awareness

Staff must be informed of mitigation and monitoring requirements prior to construction. New staff must be oriented when they come on site. The Principal/Alternate therefore needs to review compliance requirements and monitoring requirements for the job with all personnel on site to ensure that they know the requirements, know the importance of compliance, know that violations must be reported, and know that compliance is a condition of employment on this job. Similarly, a summary list of mitigation and monitoring requirements shall be posted in a conspicuous location at the job site so that they may be referred to at any time.

7. Training

If specialized expertise is necessary for mitigation or monitoring, Agency staff or the delegated construction contractor shall provide such training to the persons responsible for compliance and/or monitoring. For example, if biological pre construction surveys identify the presence of a special status species, the Agency shall retain the services of a qualified biologist familiar with this species to provide environmental training for the identification and protection of same.

8. On Going Documentation

Compliance will be monitored on a timely basis, depending on the nature of the activity and the

Mitigation requirement. Where appropriate. photo documentation of pre-construction conditions, of activities during construction, of any incidents that may constitute a violation of mitigation requirements, and of post construction conditions are encouraged. However, if photo documentation is adopted as a monitoring tool, it must be used consistently to ensure that there are records of all activities for which compliance must be documented. Labels must be explanatory and contain adequate information about the photographer, date, time, and conditions when the photo was taken. Photo documentation shall be backed up with paper copies and/or records on CD/DVD. Agency staff may audit records of compliance with mitigation and monitoring requirements at any time and compliance records must be readily available and in good order. Logs of mitigation and monitoring compliance should be maintained and supporting documentation should be provided in parallel to the log. The Agency and its project manager and other contractors will maintain such records in a form suitable for the required monitoring and reporting. It is anticipated that contractors will generally have appropriate monitoring templates for typical construction activities. In other cases, the format of compliance monitoring records may be available from the regulatory Agency approving the monitoring (if any).

9. Pre-Construction Training

Prior to initiation of construction activity, the Agency will review the mitigation commitments in this MMRP and will determine the need for pre-construction training. The Agency and its contractors will prepare appropriate training materials and provide appropriate training to construction staff to ensure that they fully understand compliance and reporting requirements. It is anticipated that pre-construction training may be necessary for the following:

- Activities that involve excavation (cultural, biological, dust, noise, traffic)
- Activities that involve use of heavy equipment (dust, noise)
- Activities in the vicinity of trees (biological)
- Activities in the vicinity of public and private utilities

10. Mitigation and Monitoring Requirements

The following includes a list of all of the mitigation measures identified in the MND.

AGRICULTURAL RESOURCES

AG-1: Prime Farmland Avoidance – The Agency will not perform recharge operations on the 60 acres of semi active farmed Prime Farmland on the northwest corner of the property.

AIR QUALITY

AQ-1: Minimization Measure for NOx Related Emissions - Construction contractor shall use off road construction diesel engines that meet, at a minimum, the Tier 4 interim California Emissions Standards, unless such an engine is not available for a particular item of equipment. Tier 3 engines will be allowed on a case by case basis when the contractor has documented that no Tier 4 interim equipment or emissions equivalent retrofit equipment is available for a particular equipment type that must be used to complete construction. Documentation shall consist of signed written statements from at least two construction equipment rental firms.

BIOLOGICAL RESOURCES

BIO-1 : Burrowing Owls – Prior to ground-disturbing activities and other habitat disturbance, clearance surveys for active burrowing owl burrows shall be conducted of all areas subject to disturbance. Prior to ground-disturbance associated with construction of the Project, including vegetation clearance and grubbing, preconstruction clearance surveys shall be conducted by a

qualified biologist within the Project site and a 500-foot buffer of the site in order to locate active burrowing owl burrows. Pre-construction clearance surveys shall be conducted no more than two (2) weeks prior to construction. Surveys will be conducted following guidelines provided in the *Staff Report on Burrowing Owl Mitigation* (CDFW 2012).

Within two (2) weeks prior to inundation, trained AVEK personnel shall review all areas subject to inundation for presence of burrows with entrances suitable for burrowing owl occupation and potential burrowing owl sign. Any identified potentially occupied burrows will be investigated further by a qualified biologist prior to inundation. Training will be conducted by a qualified biologist for AVEK personnel who conduct pre-inundation surveys prior to the commencement of the first inundation survey. Training will discuss burrowing owl identification and sign and burrow recognition, their status, and the laws governing their protection. Training will be conducted by a qualified biologist on an annual basis for all Project operations personnel as a refresher.

If no burrowing owls are detected, no further mitigation will be required. If burrowing owls are observed during any survey, the following measures will be implemented:

- Occupied burrows will not be disturbed during the nesting season (April 1 through October 15).
- Occupied burrows will not be subject to inundation during operation of the water bank.
- Avoidance shall be the preferred approach for occupied burrows whenever feasible. If occupied burrows are observed during the non-breeding season (October 16 through March 31), a 160-foot buffer will be established; no construction or other physical work activities will occur within the buffer. If occupied burrows are observed during the breeding season (April 1 through October 15), a 650-foot buffer shall be established; no construction or other physical work activities will occur within the buffer.
- When destruction of occupied burrows is unavoidable, destruction shall occur only during the non-nesting season (October 16 through March 31). Prior to destruction of occupied burrows within the Project site, any unsuitable burrows outside the disturbance footprint will be enhanced (enlarged, cleared of debris) to facilitate occupation.
- If owls must be moved away from the Project area, passive relocation techniques (e.g., installation of one-way exclusion doors at burrow entrances) will be used instead of trapping. ~~A~~ Passive relocation techniques will be employed for a minimum of one week in order to allow owls to acclimate to alternate burrows.

In order to provide protections for burrowing owls throughout construction and operations of the Project, a Burrowing Owl Protection Plan shall be developed prior to construction of the recharge basins. This plan will provide acceptable strategies for avoiding and minimizing impacts to burrowing owls and burrowing owl habitat on the Project site.

BIO-2 : Desert Kit Fox and American Badger – Clearance surveys for occupied desert kit fox and American badger dens shall be conducted prior to any Project disturbance activities, including initial construction and ongoing operations such as inundation of the recharge basins.

Within two (2) weeks prior to the start of construction, a qualified biologist shall conduct pre-construction clearance surveys of the work area and a 150-foot buffer for signs of desert kit fox and American badger, including active and inactive natal and non-natal dens, scat, prey remains, and tracks. All suitable denning locations shall be investigated for use.

Within two (2) weeks prior to inundation of the basins, trained AVEK personnel shall review all areas subject to inundation for potential sign of American badger or desert kit fox, including active and inactive natal and non-natal dens. Any identified potential sign of presence will be investigated further by a qualified biologist prior to inundation. Training will be conducted by a qualified biologist for AVEK personnel who conduct pre-inundation surveys prior to the commencement of the first inundation survey. Training will discuss American badger and desert kit fox identification and sign and den recognition, their status, and the laws governing their protection. Training will be conducted by a qualified biologist on an annual basis for all Project operations personnel as a refresher.

If dens are observed, the following measures will be implemented:

- Occupied dens will not be subject to inundation during operation of the water bank.
- Inactive dens shall be excavated by hand with a shovel to prevent badgers/kit foxes from re-using dens during construction.
- If active natal dens are observed during the survey, a buffer of 300 feet shall be established around the den; no construction or work activities will occur within the buffer. The den shall be monitored and the buffer maintained until a qualified biologist has determined that the den is no longer active, at which time it shall be excavated by hand to prevent re-use. Passive relocation of American badger and desert kit fox shall not take place while young are still in dens and dependent on the parents for food, or while females may be pregnant.
- If active, non-natal dens are observed within the Project site or buffer, badgers/kit foxes shall be discouraged from using these dens prior to clearing, grubbing, and/or grading of the site, by partially blocking the entrance of the den with sticks, debris, and soil for 3 to 5 days. Access to the den shall be incrementally blocked to a greater degree over this period, encouraging the badger/kit fox to vacate the den of its own volition. After badgers/kit foxes have stopped using active dens within the Project boundary, the dens shall be hand-excavated with a shovel to prevent re-use.
- If newly active badger/kit fox dens are found during construction activities, all work in the area shall cease until the biologist can safely close the den.
- If a desert kit fox or American badger is encountered during Project activities, all work that could result in a direct injury, disturbance, or harassment shall immediately stop and the Project biologist shall be notified.
- Where desert kit foxes have the potential to occur, all heavy equipment and vehicles left on-site overnight will be inspected at the beginning of each work day to verify that no individuals have taken shelter under the equipment. If a desert kit fox is observed, the project biologist shall be notified and the animal shall be observed from a distance until it has moved out of the area of its own accord.

BIO-3 : Nesting Birds - If construction activities occur within the breeding bird season (February 1 through September 15), all vegetation clearing and initial ground disturbing activities will be preceded by a nesting bird survey. Nesting bird surveys will be conducted by a qualified biologist of all areas that may support nesting and will be subject to disturbance, as well as a 300-foot buffer for passerine species and 500-foot buffer for raptors. Surveys will be conducted no more than 7 days prior to construction activities.

- If an active nest is observed, a no-disturbance buffer will be established until a qualified biologist has determined the nest has either failed or has successfully fledged and the young are no longer dependent on the nest. The no-disturbance buffer will measure no less than 500 feet for raptors, and 300 feet for all other species.

BIO-4 : Animal Movement and Entrapment (Trenches) - All trenches that are to be left open overnight shall be either securely covered or have wildlife escape ramps installed during non-work hours to prevent entrapment of common and special-status wildlife species. All steep-walled pipeline and utility trenches shall be inspected in the mornings and prior to backfilling to prevent mortality of common and special-status wildlife species. All entrapped wildlife shall be removed or allowed to escape voluntarily via escape ramps prior to construction resuming.

BIO-5 : Animal Movement and Entrapment (Pipes) – All pipes, culverts, or similar structures on-site with a diameter of 2 to 24 inches shall be inspected for special-status species prior to moving or welding. Openings shall be capped or otherwise covered if sections cannot be inspected to prevent the entry and potential loss of wildlife. If a common or special-status species is discovered inside a pipe, the animal shall be safely removed by a qualified biologist. The pipe segment shall not be moved until the animal has escaped, or the pipe segment shall be moved a single time out of the path of construction. Alternatively, stored pipe may be kept capped at all times until used during construction. Vertical, open-ended pipes used as fence posts, property line demarcations, sign posts, etc., will be capped or otherwise plugged to prevent the entrapment and possible injury and mortality of wildlife.

BIO-6 : Erosion and Sediment Control - Best available erosion and sediment control measures will be employed to prevent downstream dispersal of sediments during and following Project-related activities. These measures may include sediment basins, gravel bags, silt fences, geo-bags, or gravel and geotextile fabric berms, erosion control blankets, coir rolls, jute net, and straw bales. The use of erosion control materials potentially harmful to wildlife species, including monofilament netting (erosion control matting) or similar material, will not be employed.

BIO-7 : Special-Status Plants - Prior to construction of the recharge basins, floristic surveys shall be conducted of all potentially suitable habitats on the Project site. Floristic surveys shall be conducted by a qualified biologist following CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW 2009). If no special-status plants are observed, no further mitigation will be necessary. If special-status plants are observed during surveys, the following measures will be implemented:

- Individuals will be protected in place to the extent feasible through implementation of avoidance and buffers.
- If special-status plant individuals or populations must be impacted, individuals will be salvaged and/or transplanted to suitable habitat within the established on-site habitat management lands. If salvage is not feasible, mitigation at a 2:1 ratio will be provided within habitat management lands. In the case of annual species, top soil salvage may be employed to preserve the existing seed bank where appropriate enhancement of existing populations may be employed at the same 2:1 ratio.

BIO-8 : Swainson's Hawk - Prior to construction of the recharge basins, focused Swainson's hawk surveys shall be conducted. Surveys for Swainson's hawk shall be conducted by a qualified biologist following the methods outlined in Swainson's Hawk Survey Protocols, Impact Avoidance, and Minimization Measures for Renewable Energy Projects in the Antelope Valley of Los Angeles and Kern Counties, California (CDFW 2010). Surveys shall include all potential Swainson's hawk nesting habitat within a 5 mile radius of the Project site. Surveys shall include all potential nest trees, towers or other potential nest sites (including nests used within the last 5 years) outside the nesting season for Swainson's hawk.

If no active Swainson's nests are observed, no further mitigation will be necessary. If an active Swainson's hawk nest is detected during focused surveys, the following measures will be

implemented:

- No removal of active Swainson's hawk nests will be conducted during Project construction and/or operations.
- No construction activities will be conducted within a 0.5-mile radius of an active Swainson's hawk nest. Prior to construction activities, a qualified biologist will conduct a focused Swainson's hawk nest survey within an up to 0.75-mile radius of proposed construction activities to identify any active nests.
- If active Swainson's hawks nests are identified within a 0.5-mile radius of the Project site, a Habitat Management Plan will include specific, detailed measures to avoid and minimize impacts to Swainson's hawks in or near the Project site during both construction and operation of the Project.

BIO-9 : Tri-colored Blackbirds - While the Initial Study indicates that impacts to tricolored blackbird foraging habitat due to Project-related activities are less than significant, at the request of the CDFW focused nesting season surveys will be conducted as follows: Prior to construction of the recharge basins, focused nesting tri-colored blackbird surveys shall be conducted of all potentially suitable nesting habitats and documented nesting colonies within the Project site and within a 3-mile radius of the Project site for any active nesting colonies.

BIO-10 : Jurisdictional Drainages and Wetlands - Prior to construction of the recharge basins or any ground-disturbing activities within waterways and wetlands on the site, a formal Jurisdictional Delineation will be conducted of all potential jurisdictional waters within the Project site. Fill or disturbance of any jurisdictional waters or wetlands will be permitted through the appropriate agency (i.e., Sections 401 and 404 of Clean Waters Act, or Section 1600 of California Fish and Game Code). Impacts to jurisdictional waters and wetlands will be avoided to the extent feasible, and shall not occur prior to issuance of any required local, state, and federal permits.

BIO-11 : Habitat Mitigation - AVEK will designate a significant allotment of land as habitat management lands. The purpose of these areas is to provide foraging habitat for Swainson's hawk, tricolored blackbird, nesting and foraging habitat for burrowing owl, and denning and foraging habitat for desert kit fox and American badger. The details of the management of these lands shall be described in a *Habitat Management Plan* to be prepared prior to construction of the recharge basins.

BIO-12 : General Biological Measures –

Worker Environmental Awareness Training - Prior to construction, a Worker Environmental Awareness Training shall be prepared and presented by a qualified biologist to all construction personnel at the start of Project-related activities. The training shall discuss sensitive-status species with the potential to occur within the Project footprint, including their regulatory status, description, and habitat requirements, and any sensitive habitat areas that may be encountered. The program shall emphasize the importance of minimizing disturbance, and describe the federal, state, and local regulations protecting biological resources and the potential penalties for non-compliance with these laws and statutes.

Equipment Staging - All construction equipment, staging areas, materials and personnel shall be restricted to existing roadways and road shoulders, designated work areas, or previously disturbed off-site areas that are not habitat for special-status species.

Site Cleanliness - All trash and food items shall be contained and removed from the site regularly to prevent attracting predators and scavengers, such as dogs, coyotes, desert kit fox, or common ravens, to the Project area.

Hazardous Waste Cleanup - Any spills of petroleum products or other chemicals, which may represent a hazard to wildlife, shall be cleaned up promptly and in accordance with appropriate laws and regulations.

CULTURAL RESOURCES

CR-1: Cultural Resources Monitoring – The Project site has been identified to have a low to moderate potential of finding significant archaeological resources lacking surface manifestations that may be encountered during Project construction. To lessen the impact of unknown archeological resources, the Agency will develop a Cultural Resources Monitoring and Mitigation Plan prior to start of ground disturbance. This plan will implement part time monitoring by a qualified archeologist and or a Native American Monitor. In the event that project construction activities result in a finding of significant importance, the qualified archeologist may increase the level of monitoring. If no findings occur during the part time monitoring, the archeologist may further reduce or eliminate the monitoring. During a find of a potentially significant archaeological resource, the resource will be inventoried and evaluated to ascertain whether the resource meets the criteria for listing on the California Register of Historical Resources. After the discovery, all work being conducted within the vicinity of the discovery will be halted or diverted away from the site of discovery until a qualified archaeologist can assess the potential significance of the find.

CR-2: Regulation Compliance – The Agency will comply with Health and Safety Code Section 7050.5, CEQA Section 15064.S(e), and Public Resources Code Section 5097.98, which mandate the process to be followed in the unlikely event of an accidental discovery of any human remains in a location other than a dedicated cemetery.

GEOLOGY AND SOILS

GEO-1: SWPPP - To control water and wind erosion during construction and operation of the Project, the Agency will prepare a Stormwater Pollution Prevention Plan (SWPPP) in compliance with the requirements of the National Pollutant Discharge Elimination System (NPDES) Construction General Permit.

GEO-2: Seismic Design - Although the proposed Project has little inherent potential for causing seismic safety effects, the Agency will ensure that all facilities are designed to withstand the anticipated seismic forces, consistent with local and State building codes and relevant regulations.

GEO-3: Pipeline Shut Off Valves - The Agency will install shut off valves on major pipelines to minimize the potential for flooding during seismic events.

GEO-4: Groundwater Monitoring Plan - Although the potential for the Project to raise groundwater levels to within 30 to 50 feet of the ground surface is small, to address potential impacts to local groundwater levels, the Agency will develop a monitoring program to monitor changes in water levels in the area affected by groundwater recharge operations. If monitoring identifies groundwater level rise to 75 feet below ground surface, the Agency will modify management of recharge to prevent water levels from rising to levels where liquefaction effects could occur. The Groundwater Monitoring Plan will also include provisions for monitoring of groundwater quality and the development of a native groundwater quality baseline which would be identified prior to commencement of recharge operations.

HAZARDS AND HAZARDOUS MATERIALS

HAZ-1: Spill Prevention Plan - Consistent with Agency's existing practices, the Agency will require from its construction contractors the preparation and implementation of a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities and operations. The plan and methods shall be in conformance with all State and Federal regulations. The Agency shall provide for routine inspection of the construction and operations areas to verify that the measures specified in the SPCCP are properly implemented and maintained and further ensure that contractors are notified immediately if there is a noncompliance issue and will require compliance.

HAZ-2 : Bird Strike Hazard Notification - The Agency will notify the Flight Safety Office at Edwards Air Force Base and all local airports of the potential bird strike hazard as follows:

- Prior to application of water to the recharge basins, and
- If large birds or large concentrations of small birds are observed in or near the recharge area.

HAZ-3: Bird Strike Hazard Minimization Measures - The Agency will implement actions to reduce the attractiveness of the recharge basins to birds by:

- Use of recharge basins with shallow water depths which will be generally unsuitable for the larger migratory birds,
- Monitor recharge area water and if aquatic macroinvertebrates are found to be developing in large numbers and/or foraging by shorebirds is observed, temporarily dry out recharge areas, thereby reducing the insect and aquatic macroinvertebrate forage that would attract and hold shorebirds.
- Whenever water is present in the recharge basins, the project operator will monitor the basins daily for bird activity and if found discourage their use via means acceptable to the Department of Fish and Wildlife.

HAZ-4: Mosquito Borne Disease Minimization Measures – The Agency will consult with the Antelope Valley Mosquito and Vector Control District to develop and implement a mosquito management plan. The plan would consist of a Project specific mosquito abatement program that would include quantitative abatement thresholds. The Agency and/or its representative would monitor mosquito larvae production in the recharge basins, drainages, and distribution. Larvae populations would be tracked using methods and thresholds approved by the Mosquito Abatement District, and suppression measures would be employed when thresholds are exceeded. The primacy mode of suppression would be to monitor for mosquito presence and if mosquito larvae are found, to cycle recharge temporarily so that units of recharge would be dried.

HYDROLOGY AND WATER QUALITY

HWQ-1: Drainage Design - Recharge areas will be constructed so that they will not divert sheet flooding and other runoff away from the recharge areas. This will allow flood water to flow into the recharge areas where flows will be somewhat retarded by the recharge berms. Berms will be designed with berm heights below the calculated flood depth elevations and intended to be sacrificial. Flood flows would enter the site, go through the berms, overtop or destroy the

berms in sequence, and eventually exit the project site along the eastern boundary of the proposed project in a manner similar to pre-project conditions.

HWQ-2: **Stormwater Pollution Prevention Plan (SWPPP)** - To reduce or eliminate Construction related water quality effects, before onset of any construction activities, the Agency or its contractor will prepare a Storm Water Pollution Prevention Plan. The SWPPP will include temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover). These measures will be employed to control erosion from disturbed areas. Measures for the control of pollutants during construction include:

- Use of existing access points to minimize dust and tracking materials onto Public Streets,
- Designated Parking, Storage, and Service Areas protected by silt fence and oil absorbents and sloped to control drainage,
- Minimize diesel storage,
- Stockpile spill cleanup materials,
- Regular vehicle inspection for leaks.
- Fuel off-channel with a secondary containment system for spills,
- Use quick connects whenever possible,
- Fueling by authorized personnel only, and
- Spill cleanup materials readily available.

The SWPPP shall include a Fugitive Dust Control Plan (FDCP) that will include extensive measures to control and manage soil erosion. The FDCP will provide for management of open soils that will contribute to management of runoff.

Consistent with the SWPPP and the Agency's current construction management practices, the Agency or its agent will perform routine inspections of the construction area to verify that the BMPs specified in the SWPPP are properly implemented and maintained. The Agency will notify its contractors immediately if there is a noncompliance issue and will require compliance.

HWQ-3: Spill Prevention Plan - Consistent with Agency's existing practices, the Agency will require from its construction contractors the preparation and implementation of a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities and operations. The plan and methods shall be in conformance with all State and Federal regulations. The Agency shall provide for routine inspection of the construction and operations areas to verify that the measures specified in the SPCCP are properly implemented and maintained and further ensure that contractors are notified immediately if there is a noncompliance issue and will require compliance.

HWQ-4: Protection of Off Site Wells. To address potential impacts to groundwater and adjacent well owners, the Agency will develop a monitoring program to monitor changes in water levels and well production in the area affected by groundwater recharge operations. The program will specify that:

- Extractions of groundwater shall not exceed 90% of the amount of water recharged,
- Water quality in recovered water and in groundwater flowing away from the Project will be monitored to ensure that water quality remains appropriate for designated beneficial uses,

- During recharge operations, water levels will be monitored and recharge operations will be suspended in the event that offsite water levels rise to within 75 feet of the ground surface, and
- During recovery operations, water levels in offsite wells will be monitored and operations will be adjusted if offsite wells are found to be adversely affected by project operations,

HWQ-5: Management of Herbicides and Pesticides - The Agency will comply with all regulations of the California Department of Pesticide Regulation regarding the use of herbicides and pesticides in areas designated for groundwater recharge.

NOISE

NOISE-1: Construction Noise Monitoring and Minimization Measures – The Agency and its construction contractors will monitor noise levels for construction activities near and along 280th Street West corresponding to the eastern boundary of the proposed Project area which includes potential noise receptors (residential homes). In the event that noise levels exceed the County of Los Angeles designated thresholds, the construction contractor will implement noise reduction measures to include:

- Providing construction equipment with sound control devices.
- With the exception of well drilling operations, restrict construction activities to day time hours.
- In the event that construction activities occur close to sensitive noise receptors, implementing appropriate additional noise mitigation measures, including but not limited to:
    - Changing the location of stationary construction equipment,
    - Shutting off idling equipment,
    - Rescheduling construction activity
    - Notifying adjacent residents in advance of construction work, and
    - Installing acoustic barriers around stationary construction noise sources.

NOISE-2: Operation Noise Minimization Measures – The Agency proposes to construct approximately 7 groundwater wells in the vicinity of 280th St. West which have the potential to increase the ambient noise level for the nearby residential homes on the east side of 280th St. West during groundwater recovery operations. The Agency proposes to equip these wells with insulated well enclosures that will reduce the operational noise level in the area to less than significant.

TRIBAL CULTURAL RESOURCES

TCR-1: Inadvertent Finds –

1. If human remains or funerary objects are encountered during any activities associated with the project, work in the immediate vicinity (within a 100-foot buffer of the find) shall cease and the County Coroner shall be contacted pursuant to State Health and Safety Code §7050.5 and that code enforced for the duration of the project.

2. In the event that Native American cultural resources are discovered during project activities, all work in the immediate vicinity of the find (within a 60-foot buffer) shall cease and a qualified archaeologist meeting Secretary of Interior (SOI) standards shall be hired to

assess the find. Work on the other portions of the project outside of the buffered area may continue during this assessment period. Additionally, San Manuel Band of Mission Indians will be contacted if any such find occurs and be provided information and permitted/invited to perform a site visit when the archaeologist makes his/her assessment, so as to provide Tribal input.

3. If significant Native American historical resources, as defined by CEQA (as amended, 2015), are discovered and avoidance cannot be ensured, an SOI-qualified archaeologist shall be retained to develop an cultural resources Treatment Plan, as well as a Discovery and Monitoring Plan, the drafts of which shall be provided to San Manuel Band of Mission Indians for review and comment.

    a. All in-field investigations, assessments, and/or data recovery enacted pursuant to the finalized Treatment Plan shall be monitored by a San Manuel Band of Mission Indians Tribal Participant(s).
    b. The Lead Agency and/or applicant shall, in good faith, consult with San Manuel Band of Mission Indians on the disposition and treatment of any artifacts or other cultural materials encountered during the project.

UTILITIES AND SERVICE SYSTEMS

UTIL-1: Electrical Service Upgrade Minimization Measures – In the event that the existing electrical grid system needs to be expanded to meet the proposed project demands, the Agency will require that the Electric Company comply with all mitigation measures identified in this Initial Study during the construction of the expansion.

Appendix B
Air Quality/Greenhouse Gas Analysis

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September 20, 2021

Ms. Julie Gilbert
Compass Consulting Enterprises, Inc.
PO Box 2627
Avalon, CA 90704

Subject: Antelope Valley – East Kern Water Agency – High Desert Water Bank – Focused Air Quality and Greenhouse Gas Impact Evaluation for Revised Project Design

Dear Ms. Gilbert:

MD Acoustics, LLC (MD) has completed a focused Air Quality and Greenhouse Gas Evaluation for the proposed High Desert Water Bank project in Antelope Valley, California. The purpose of this focused study is to evaluate the air quality and greenhouse gas construction emissions generated by the project, according to the proposed revised project design, and to compare the project emissions to Antelope Valley Air Quality Management District's (AVAQMD) thresholds of significance as it relates to residential and commercial uses. A list of definitions and terminology is located in Appendix A.

1.0 Project Description

The Project Site is approximately 1,500 acres and is currently consists of undeveloped and fallowed agricultural land bounded by Avenue A (Kern / Los Angeles County Line) on the north, 300th Street West on the west, 280th Street West on the East, and the California Aqueduct on the south. The Project will be a groundwater recharge and recovery program that includes the construction of a new turnout off of the California Aqueduct, a new approximately 11.5 mile transmission underground pipeline, new recharge facilities consisting of 42 engineered fill berms and concrete spillways over 890 acres of the site, 28 new groundwater extraction wells, 5 new monitoring wells, and a new booster pump station.

The site is surrounded by the Tehachapi and San Gabriel mountain ranges to the north, south, and west. With the exception of some isolated residential homes within and to the east of the Project area, the nearest residential communities are located ½ mile south and east of the Project area.

2.0 AQ/GHG Thresholds of Significance

2.1 AQ Significance Thresholds

Project emissions were compared to regional AVAQMD's thresholds of significance for construction emissions[1].

2.2 GHG Significance Thresholds

The project emissions were compared to the AVAQMD's 100,000 tons CO_2e per year and 548,000 pounds CO_2e per day threshold for all land uses[1].

[1] https://avaqmd.ca.gov/files/e5b34d385/AV%20CEQA%20Guides%202016.pdf

3.0 Evaluation Procedure/Methodology

MD utilized the latest version of CalEEMod (2020.4.0) to calculate both the construction emissions from the project site[2]. Project construction is anticipated to commence no earlier than the fourth quarter of 2021 and take approximately 21 months to complete. Therefore, for modeling purposes, construction was assumed to be begin December 2021 and be completed by April 2024. Construction assumes grading, building construction, paving, and architectural coating. CalEEmod defaults were utilized. Assumptions and output calculations for winter, summer and annual are provided in Appendix C.

AECOM had previously performed air quality analyses for this project prior to an update to the project design. MD used the calculations done by AECOM as a basis to show the estimated impact the update would have on emissions. MD performed calculations for only the activities that were being updated, that is Activity 3: Transmission Facility / Underground Pipeline; Activity 4: Recharge Facility / Recharge Basin, Grading, Above-ground Pipeline Install; and Activity 5: Recovery Facilities / Extraction Wells / Recovery. The updates upon which the calculations were based are detailed in Table 1.

Table 1: Construction Assumption Comparison

2017 Original Project Design	2021 Revised Project Design
Activity 3: Transmission Facility / Underground Pipeline	
1 crane (190 hp, 2 hours per day)	2 cranes (190 hp, 2 hours per day)
1 hydraulic excavator (180 hp, 6 hours per day)	2 hydraulic excavators (180 hp, 6 hours per day)
1 grader (174 hp, 6 hours per day)	2 graders (174 hp, 6 hours per day)
1 off-highway truck (479 hp, 4 hours per day)	1 off-highway truck (479 hp, 4 hours per day)
2 water trucks (200 hp, 4 hours per day)	2 water trucks (200 hp, 4 hours per day)
1 belly scraper (313 hp, 4 hours per day)	3 belly scrapers (313 hp, 4 hours per day)
2 wheeled loaders (165 hp, 8 hours per day)	2 wheeled loaders (165 hp, 8 hours per day)
1 skip loader (88 hp, 3 hours per day)	1 skip loader (88 hp, 3 hours per day)
2 backhoes (108 hp, 5 hours per day)	4 backhoes (108 hp, 5 hours per day)
Approx Total Acres disturbance: 9.5 miles x 20 ft wide = **23 AC** Estimated Construct Time: 10 months	Approx Total Acres disturbance: 11.5 miles x 20 ft wide = **27 AC** Estimated Construct Time: 12
Activity 4: Recharge Facility / Recharge Basin, Grading, Above-ground Pipeline Install	
2 backhoes (108 hp, 5 hours per day)	2 backhoes (108 hp, 5 hours per day)
	2 graders (174 hp, 6 hours per day)
	2 off-highway truck (479 hp, 4 hours per day)
	2 water trucks (200 hp, 4 hours per day)
	6 belly scrapers (313 hp, 6 hours per day)
	2 wheeled loaders (165 hp, 6 hours per day)
	2 skip loaders (88 hp, 3 hours per day)
Approx Total Acres disturbance: **1,200 AC** Estimated Construct Time: 10 months Initial 6 months continuously to re-establish as needed	Approx Total Acres disturbance: **890 AC** Estimated Construct Time: 12 months Initial

[2] https://www.caleemod.com/

2017 Original Project Design	2021 Revised Project Design
Activity 5: Recovery Facilities / Extraction Wells / Recovery	
1 drilling rig (500 HP, 24 hrs per day for 90 days)	2 drilling rigs (500 HP, 24 hrs per day for 90 days)
1 hydraulic excavator (180 hp, 6 hours per day)	2 hydraulic excavators (180 hp, 6 hours per day)
1 grader (174 hp, 6 hours per day)	2 off-highway trucks (479 hp, 4 hours per day)
1 off-highway truck (479 hp, 4 hours per day)	2 wheeled loaders (313 hp; 1 hour per day)
1 small roller compactor (114 hp, 1 hour per day)	1 water truck (200 hp, 1 hour per day)
1 skip loader (88 hp, 1 hour per day)	2 Test pumps (200 hp, 60 hrs per well)
1 wheeled loader (313 hp; 1 hour per day)	2 skip loaders (88 hp, 1 hour per day)
1 water truck (200 hp, 1 hour per day)	2 small roller compactors (114 hp, 1 hour per day)
Test pump (200 hp, 60 hrs per well)	2 graders (174 hp, 6 hours per day)
Approx Total Acres disturbance: 100 x 100 pad x 18 pads = **4.13 AC**	Approx Total Acres disturbance: 100 x 100 pad x 28 pads = **6.5 AC**
Estimated Construct Time: 12 months	Estimated Construct Time: 30 months

4.0 Findings

The following outlines the emissions for the project:

4.1 Regional Construction Emissions

The construction emissions for the project would not exceed the AVAQMD's daily emission thresholds at the regional level as indicated in Table 2, and therefore the impact would not be considered significant. The emissions were calculated using Mitigation Measure AQ-1, which requires the use of off-road construction diesel engines that meet Tier 4 interim California Emission Standards. Unmitigated emissions would exceed the NO_x threshold of 137 pounds per day by approximately 50 pounds per day, while mitigates emissions would be below the same threshold by approximately 0.85 pounds per day. CalEEMod outputs for these calculations can be found in Appendices B – D.

<Table 2, next page>

Table 2: Regional Significance – Construction Emissions (lbs/day)

Activity	Pollutant Emissions (pounds/day)				
	VOC	NOx	CO	PM10	PM2.5
Activity 3: Transmission Facility / Underground Pipeline					
2017 Original Project Design[2]	1.36	21.76	39.21	10.05	2.98
2021 Revised Project Design - Unmitigated	4.47	38.71	44.65	4.19	2.21
2021 Revised Project Design - Mitigated	1.84	26.26	56.09	2.65	0.08
Mitigated Emission Change	0.48	4.50	16.88	-7.40	-2.90
Activity 4: Recharge Facility / Recharge Basin, Grading, Above-ground Pipeline Install					
2017 Original Project Design[2]	0.61	4.43	12.02	3.01	1.73
2021 Revised Project Design - Unmitigated	6.89	66.94	59.23	6.38	3.31
2021 Revised Project Design - Mitigated	2.29	32.24	70.63	3.73	0.89
Mitigated Emission Change	1.68	27.81	58.61	0.72	-0.84
Activity 5: Recovery Facilities / Extraction Wells / Recovery					
2017 Original Project Design[2]	2.79	45.12	77.05	38.47	5.67
2021 Revised Project Design - Unmitigated	9.71	88.81	74.32	6.45	3.78
2021 Revised Project Design - Mitigated	5.10	73.69	150.70	3.92	1.42
Mitigated Emission Change	2.31	28.57	73.65	-34.55	-4.25
Subtotal of Activities 1,2,5 (overlap Year 1, months 1-3)					
2017 Original Project Design[2]	5.79	88.06	146.07	57.3	10.56
2021 Revised Project Design - Unmitigated	12.71	131.75	143.34	25.28	8.67
2021 Revised Project Design - Mitigated	8.10	116.63	219.72	22.75	6.31
Subtotal of Activities 3,5 (overlap Year 1, months 11,12)					
2017 Original Project Design[2]	4.15	66.88	116.26	48.52	8.65
2021 Revised Project Design - Unmitigated	14.18	127.52	118.97	10.64	5.99
2021 Revised Project Design - Mitigated	6.94	99.95	206.79	6.58	1.50
Subtotal of Activities 3,5,6 (overlap Year 2, months 1-5)					
2017 Original Project Design[2]	30.99	97.09	153.59	70.08	13.11
2021 Revised Project Design - Unmitigated	41.02	157.73	156.30	32.20	10.45
2021 Revised Project Design - Mitigated	33.78	130.16	244.12	28.14	5.96
Subtotal of Activities 4.5,6 (overlap Year 2, month 6)					
2017 Original Project Design[2]	30.24	79.76	126.4	63.05	11.86
2021 Revised Project Design - Unmitigated	43.44	185.96	170.89	34.39	11.54
2021 Revised Project Design - Mitigated	34.23	136.14	258.65	29.23	6.77
2017 Maximum Daily Construction Emissions[2]	30.99	97.09	153.59	70.08	13.11
2021 Unmitigated Maximum Daily Construction Emissions	43.44	185.96	170.89	34.39	11.54
2021 Mitigated Maximum Daily Construction Emissions	**34.23**	**136.14**	**258.65**	**29.23**	**6.77**
Change in Maximum Daily Construction Emissions - Unmitigated	12.45	88.87	17.30	-35.69	-1.57
Change in Maximum Daily Construction Emissions - Mitigated	3.24	39.05	105.06	-40.85	-6.34
AVAQMD Thresholds	**137**	**137**	**548**	**82**	**65**
Exceeds Thresholds	No	**No**	No	No	No

Notes:
[1] Source: CalEEMod Version 2020.4.0
[2] Source: 2017 AECOM – Air Quality Technical Memorandum

4.2 GHG Emissions

Table 3 outlines the construction GHG emissions for the project. The project's emissions are below both AVAQMD's thresholds of 100,000 $MTCO_2e$ per year and 548,000 pounds CO_2e per day for all land uses and therefore, the impact is less than significant. The emissions were calculated using Mitigation Measure AQ-1, which requires the use of off-road construction diesel engines that meet Tier 4 interim California Emission

Standards. The mitigation had a negligible effect on GHG emissions. CalEEMod outputs for these calculations can be found in Appendices B – D.

Table 3: Construction Greenhouse Gas Emissions

Activity	GHG Emissions	
	Annual (MT CO_2e/yr)	Daily (lbs CO_2e/day)
Activity 3: Transmission Facility / Underground Pipeline		
2017 Original Project Design[2]	561.85	8,624.00
2021 Revised Project Design	869.92	10,091.53
Emission Change	308.07	1,467.53
Activity 4: Recharge Facility / Recharge Basin, Grading, Above-ground Pipeline Install		
2017 Original Project Design[2]	30.60	3,270.40
2021 Revised Project Design	1,412.66	12,241.80
Emission Change	1,382.06	8,971.40
Activity 5: Recovery Facilities / Extraction Wells / Recovery		
2017 Original Project Design[2]	1,260.59	18,726.40
2021 Revised Project Design	3,575.54	30,751.31
Emission Change	2,314.95	12,024.91
Subtotal of Activities 1,2,5 (overlap Year 1, months 1-3)		
2017 Original Project Design[2]	-	37,049.60
2021 Revised Project Design	-	49,074.51
Subtotal of Activities 3,5 (overlap Year 1, months 11,12)		
2017 Original Project Design[2]	-	27,350.40
2021 Revised Project Design	-	40,842.84
Subtotal of Activities 3,5,6 (overlap Year 2, months 1-5)		
2017 Original Project Design[2]	-	38,214.40
2021 Revised Project Design	-	51,706.84
Subtotal of Activities 4.5,6 (overlap Year 2, month 6)		
2017 Original Project Design[2]	-	32,860.80
2021 Revised Project Design	-	53,857.11
2017 Maximum Construction Emissions[2]	4,815.00	38,214.40
2021 Maximum Construction Emissions	**8,820.08**	**53,857.11**
Change in Maximum Construction Emissions	4,005.08	15,642.71
AVAQMD Thresholds	**100,000.00**	**548,000.00**
Exceeds Thresholds	No	No

Notes:
[1] Source: CalEEMod Version 2020.4.0
[2] Source: 2017 AECOM – Air Quality Technical Memorandum

6.0 Conclusions

Construction project emissions were evaluated and compared to regional AVAQMD's thresholds of significance. In addition, project GHG emissions were evaluated and compared to AVAQMD's draft thresholds of 100,000 $MTCO_2e$ per year and 548,000 pounds CO_2e per day year for all land uses. Project

emissions are anticipated to be below AVAQMD's thresholds of significance with use of Mitigation Measure AQ-1. Therefore, the impact is less than significant.

MD is pleased to provide this focused Air Quality and Greenhouse Gas. If you have any questions regarding this analysis, please don't hesitate to call us at (805) 426-4477.

Sincerely,
MD Acoustics, LLC

Mike Dickerson, INCE
Principal

Tyler Klassen
Air Quality Specialist

Appendix A

Glossary of Terms

AQMP	Air Quality Management Plan
AVAQMD	Antelope Valley Air Quality Management District
CAAQS	California Ambient Air Quality Standards
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CFCs	Chlorofluorocarbons
CH_4	Methane
CNG	Compressed natural gas
CO	Carbon monoxide
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DPM	Diesel particulate matter
GHG	Greenhouse gas
HFCs	Hydrofluorocarbons
LST	Localized Significant Thresholds
$MTCO_2e$	Metric tons of carbon dioxide equivalent
$MMTCO_2e$	Million metric tons of carbon dioxide equivalent
NAAQS	National Ambient Air Quality Standards
NOx	Nitrogen Oxides
NO_2	Nitrogen dioxide
N_2O	Nitrous oxide
O_3	Ozone
PFCs	Perfluorocarbons
PM	Particle matter
PM10	Particles that are less than 10 micrometers in diameter
PM2.5	Particles that are less than 2.5 micrometers in diameter
PMI	Point of maximum impact
PPM	Parts per million
PPB	Parts per billion
RTIP	Regional Transportation Improvement Plan
RTP	Regional Transportation Plan
SCAB	South Coast Air Basin
SCAQMD	South Coast Air Quality Management District
SF_6	Sulfur hexafluoride
SIP	State Implementation Plan
SOx	Sulfur Oxides
SRA	Source/Receptor Area
TAC	Toxic air contaminants
VOC	Volatile organic compounds
WRCC	Western Regional Climate Center

Appendix B

CalEEMod Outputs – Activity 3

AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

AVEK - Transmission Facility

Antelope Valley APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	27.00	Acre	27.00	1,176,120.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Proposed Undergroud Pipelines/Trenching [Transmission Facility, Table 2.4-2]

Land Use - Per AVEK AECOM AQ technical memo, 27 acres for this phase

Construction Phase - Per project schedule, estimated construction is from August 2022 through September 2023

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 graders (174 hp, 6 hours per day)
3 belly scraper (313 hp, 4 hours per day)
2 wheeled loaders (165 hp, 8 hours per day)

AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 cranes (190 hp, 2 hours per day)
2 hydraulic excavators (180 hp, 6 hours per day)
2 graders (174 hp, 6 hours per day)
1 off-highway truck (479 hp, 4 hours per day)
2 water trucks (200 hp, 4 hours per day)
3 belly scrapers (313 hp, 4 hours per day)
2 wheeled loaders (165 hp, 8 hours per day)
1 skip loader (88 hp, 3 hours per day)
4 backhoes (108 hp, 5 hours per day)

Grading - Excess spoil from excavation operations will be incorporated into the recharge basin berms and thus will not be hauled off site.

Trips and VMT - Per AECOM 2017 Air Quality Report, 60 worker trips and 4 delivery trips at 60 miles in length

Construction Off-road Equipment Mitigation - Per AVEK AECOM 2017 technical memorandum, AQ-1 mitigation measure applied.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	45.00	305.00
tblConstructionPhase	PhaseEndDate	9/30/2022	9/30/2023
tblConstructionPhase	PhaseEndDate	9/30/2022	9/30/2023

AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblConstructionPhase	PhaseStartDate	10/1/2022	8/1/2022
tblGrading	AcresOfGrading	686.25	27.00
tblOffRoadEquipment	HorsePower	187.00	174.00
tblOffRoadEquipment	HorsePower	367.00	313.00
tblOffRoadEquipment	HorsePower	97.00	165.00
tblOffRoadEquipment	HorsePower	231.00	190.00
tblOffRoadEquipment	HorsePower	158.00	180.00
tblOffRoadEquipment	HorsePower	402.00	479.00
tblOffRoadEquipment	HorsePower	402.00	200.00
tblOffRoadEquipment	HorsePower	65.00	88.00
tblOffRoadEquipment	HorsePower	97.00	108.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	4.4711	38.6260	44.6479	0.1016	2.5043	1.6897	4.1940	0.6542	1.5551	2.2092	0.0000	9,990.0047	9,990.0047	2.3836	0.1407	10,091.5311
2023	4.1484	34.4955	43.2269	0.1007	2.5043	1.4846	3.9889	0.6542	1.3661	2.0202	0.0000	9,912.8649	9,912.8649	2.3780	0.1323	10,011.7264
Maximum	**4.4711**	**38.6260**	**44.6479**	**0.1016**	**2.5043**	**1.6897**	**4.1940**	**0.6542**	**1.5551**	**2.2092**	**0.0000**	**9,990.0047**	**9,990.0047**	**2.3836**	**0.1407**	**10,091.5311**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	1.8406	26.5078	56.0936	0.1016	2.5043	0.1493	2.6536	0.6542	0.1477	0.8018	0.0000	9,990.0047	9,990.0047	2.3836	0.1407	10,091.5311
2023	1.7734	26.1864	55.1581	0.1007	2.5043	0.1401	2.6444	0.6542	0.1389	0.7930	0.0000	9,912.8649	9,912.8649	2.3780	0.1323	10,011.7264
Maximum	**1.8406**	**26.5078**	**56.0936**	**0.1016**	**2.5043**	**0.1493**	**2.6536**	**0.6542**	**0.1477**	**0.8018**	**0.0000**	**9,990.0047**	**9,990.0047**	**2.3836**	**0.1407**	**10,091.5311**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**58.07**	**27.94**	**-26.60**	**0.00**	**0.00**	**90.88**	**35.26**	**0.00**	**90.19**	**62.29**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	8/1/2022	9/30/2023	5	305	
2	Site Preparation	Trenching	8/1/2022	9/30/2023	5	305	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 27

Acres of Paving: 27

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Graders	2	6.00	174	0.41
Grading	Scrapers	3	4.00	313	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	165	0.37
Site Preparation	Cranes	2	2.00	190	0.29
Site Preparation	Excavators	2	6.00	180	0.38
Site Preparation	Off-Highway Trucks	1	4.00	479	0.38
Site Preparation	Off-Highway Trucks	2	4.00	200	0.38
Site Preparation	Skid Steer Loaders	1	3.00	88	0.37
Site Preparation	Tractors/Loaders/Backhoes	4	5.00	108	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	7	18.00	2.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	12	30.00	2.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Use Cleaner Engines for Construction Equipment

3.2 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0939	0.0000	0.0939	0.0101	0.0000	0.0101			0.0000			0.0000
Off-Road	2.3096	23.0008	21.3801	0.0392		1.0714	1.0714		0.9857	0.9857		3,791.5456	3,791.5456	1.2263		3,822.2022
Total	**2.3096**	**23.0008**	**21.3801**	**0.0392**	**0.0939**	**1.0714**	**1.1653**	**0.0101**	**0.9857**	**0.9958**		**3,791.5456**	**3,791.5456**	**1.2263**		**3,822.2022**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0175	0.5642	0.1185	2.9700e-003	0.1110	7.1100e-003	0.1181	0.0319	6.8000e-003	0.0387		313.5020	313.5020	1.7600e-003	0.0451	326.9899
Worker	0.2282	0.2145	3.6109	7.9500e-003	0.8207	4.9600e-003	0.8256	0.2176	4.5700e-003	0.2221		808.4070	808.4070	0.0184	0.0189	814.5107
Total	**0.2456**	**0.7787**	**3.7293**	**0.0109**	**0.9317**	**0.0121**	**0.9437**	**0.2495**	**0.0114**	**0.2609**		**1,121.9090**	**1,121.9090**	**0.0202**	**0.0641**	**1,141.5006**

AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0939	0.0000	0.0939	0.0101	0.0000	0.0101			0.0000			0.0000
Off-Road	0.5604	13.8151	25.2851	0.0392		0.0641	0.0641		0.0641	0.0641	0.0000	3,791.5456	3,791.5456	1.2263		3,822.2022
Total	**0.5604**	**13.8151**	**25.2851**	**0.0392**	**0.0939**	**0.0641**	**0.1580**	**0.0101**	**0.0641**	**0.0743**	**0.0000**	**3,791.5456**	**3,791.5456**	**1.2263**		**3,822.2022**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0175	0.5642	0.1185	2.9700e-003	0.1110	7.1100e-003	0.1181	0.0319	6.8000e-003	0.0387		313.5020	313.5020	1.7600e-003	0.0451	326.9899
Worker	0.2282	0.2145	3.6109	7.9500e-003	0.8207	4.9600e-003	0.8256	0.2176	4.5700e-003	0.2221		808.4070	808.4070	0.0184	0.0189	814.5107
Total	**0.2456**	**0.7787**	**3.7293**	**0.0109**	**0.9317**	**0.0121**	**0.9437**	**0.2495**	**0.0114**	**0.2609**		**1,121.9090**	**1,121.9090**	**0.0202**	**0.0641**	**1,141.5006**

3.2 Grading - 2023

AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0939	0.0000	0.0939	0.0101	0.0000	0.0101			0.0000			0.0000
Off-Road	2.1389	20.5682	20.9902	0.0392		0.9489	0.9489		0.8730	0.8730		3,793.3368	3,793.3368	1.2268		3,824.0079
Total	**2.1389**	**20.5682**	**20.9902**	**0.0392**	**0.0939**	**0.9489**	**1.0428**	**0.0101**	**0.8730**	**0.8832**		**3,793.3368**	**3,793.3368**	**1.2268**		**3,824.0079**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.4900e-003	0.4384	0.0857	2.8500e-003	0.1110	2.8900e-003	0.1139	0.0319	2.7600e-003	0.0347		301.0844	301.0844	1.2500e-003	0.0431	313.9590
Worker	0.2105	0.1883	3.2846	7.7000e-003	0.8207	4.6800e-003	0.8254	0.2176	4.3100e-003	0.2219		787.5188	787.5188	0.0163	0.0173	793.0728
Total	**0.2179**	**0.6268**	**3.3703**	**0.0106**	**0.9317**	**7.5700e-003**	**0.9392**	**0.2495**	**7.0700e-003**	**0.2566**		**1,088.6032**	**1,088.6032**	**0.0175**	**0.0604**	**1,107.0317**

Mitigated Construction On-Site

AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0939	0.0000	0.0939	0.0101	0.0000	0.0101			0.0000			0.0000
Off-Road	0.5604	13.8151	25.2851	0.0392		0.0641	0.0641		0.0641	0.0641	0.0000	3,793.3368	3,793.3368	1.2268		3,824.0079
Total	**0.5604**	**13.8151**	**25.2851**	**0.0392**	**0.0939**	**0.0641**	**0.1580**	**0.0101**	**0.0641**	**0.0743**	**0.0000**	**3,793.3368**	**3,793.3368**	**1.2268**		**3,824.0079**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.4900e-003	0.4384	0.0857	2.8500e-003	0.1110	2.8900e-003	0.1139	0.0319	2.7600e-003	0.0347		301.0844	301.0844	1.2500e-003	0.0431	313.9590
Worker	0.2105	0.1883	3.2846	7.7000e-003	0.8207	4.6800e-003	0.8254	0.2176	4.3100e-003	0.2219		787.5188	787.5188	0.0163	0.0173	793.0728
Total	**0.2179**	**0.6268**	**3.3703**	**0.0106**	**0.9317**	**7.5700e-003**	**0.9392**	**0.2495**	**7.0700e-003**	**0.2566**		**1,088.6032**	**1,088.6032**	**0.0175**	**0.0604**	**1,107.0317**

3.3 Site Preparation - 2022

Unmitigated Construction On-Site

AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5181	13.9247	13.4019	0.0353		0.5909	0.5909		0.5436	0.5436		3,415.7030	3,415.7030	1.1047		3,443.3207
Total	**1.5181**	**13.9247**	**13.4019**	**0.0353**		**0.5909**	**0.5909**		**0.5436**	**0.5436**		**3,415.7030**	**3,415.7030**	**1.1047**		**3,443.3207**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0175	0.5642	0.1185	2.9700e-003	0.1110	7.1100e-003	0.1181	0.0319	6.8000e-003	0.0387		313.5020	313.5020	1.7600e-003	0.0451	326.9899
Worker	0.3803	0.3576	6.0181	0.0132	1.3678	8.2700e-003	1.3761	0.3626	7.6100e-003	0.3702		1,347.3451	1,347.3451	0.0307	0.0316	1,357.5178
Total	**0.3977**	**0.9218**	**6.1366**	**0.0162**	**1.4788**	**0.0154**	**1.4941**	**0.3945**	**0.0144**	**0.4089**		**1,660.8471**	**1,660.8471**	**0.0325**	**0.0767**	**1,684.5077**

Mitigated Construction On-Site

AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6368	10.9923	20.9426	0.0353		0.0578	0.0578		0.0578	0.0578	0.0000	3,415.7030	3,415.7030	1.1047		3,443.3207
Total	**0.6368**	**10.9923**	**20.9426**	**0.0353**		**0.0578**	**0.0578**		**0.0578**	**0.0578**	**0.0000**	**3,415.7030**	**3,415.7030**	**1.1047**		**3,443.3207**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0175	0.5642	0.1185	2.9700e-003	0.1110	7.1100e-003	0.1181	0.0319	6.8000e-003	0.0387		313.5020	313.5020	1.7600e-003	0.0451	326.9899
Worker	0.3803	0.3576	6.0181	0.0132	1.3678	8.2700e-003	1.3761	0.3626	7.6100e-003	0.3702		1,347.3451	1,347.3451	0.0307	0.0316	1,357.5178
Total	**0.3977**	**0.9218**	**6.1366**	**0.0162**	**1.4788**	**0.0154**	**1.4941**	**0.3945**	**0.0144**	**0.4089**		**1,660.8471**	**1,660.8471**	**0.0325**	**0.0767**	**1,684.5077**

3.3 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Off-Road	1.4333	12.5482	13.3063	0.0353		0.5174	0.5174		0.4760	0.4760		3,417.3092	3,417.3092	1.1052		3,444.9399
Total	**1.4333**	**12.5482**	**13.3063**	**0.0353**		**0.5174**	**0.5174**		**0.4760**	**0.4760**		**3,417.3092**	**3,417.3092**	**1.1052**		**3,444.9399**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.4900e-003	0.4384	0.0857	2.8500e-003	0.1110	2.8900e-003	0.1139	0.0319	2.7600e-003	0.0347		301.0844	301.0844	1.2500e-003	0.0431	313.9590
Worker	0.3508	0.3139	5.4743	0.0128	1.3678	7.8000e-003	1.3756	0.3626	7.1800e-003	0.3698		1,312.5313	1,312.5313	0.0271	0.0288	1,321.7880
Total	**0.3582**	**0.7523**	**5.5601**	**0.0157**	**1.4788**	**0.0107**	**1.4895**	**0.3945**	**9.9400e-003**	**0.4045**		**1,613.6157**	**1,613.6157**	**0.0284**	**0.0719**	**1,635.7469**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6368	10.9923	20.9426	0.0353		0.0578	0.0578		0.0578	0.0578	0.0000	3,417.3092	3,417.3092	1.1052		3,444.9399
Total	**0.6368**	**10.9923**	**20.9426**	**0.0353**		**0.0578**	**0.0578**		**0.0578**	**0.0578**	**0.0000**	**3,417.3092**	**3,417.3092**	**1.1052**		**3,444.9399**

AVEK - Transmission Facility - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.4900e-003	0.4384	0.0857	2.8500e-003	0.1110	2.8900e-003	0.1139	0.0319	2.7600e-003	0.0347		301.0844	301.0844	1.2500e-003	0.0431	313.9590
Worker	0.3508	0.3139	5.4743	0.0128	1.3678	7.8000e-003	1.3756	0.3626	7.1800e-003	0.3698		1,312.5313	1,312.5313	0.0271	0.0288	1,321.7880
Total	**0.3582**	**0.7523**	**5.5601**	**0.0157**	**1.4788**	**0.0107**	**1.4895**	**0.3945**	**9.9400e-003**	**0.4045**		**1,613.6157**	**1,613.6157**	**0.0284**	**0.0719**	**1,635.7469**

AVEK - Transmission Facility - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

AVEK - Transmission Facility

Antelope Valley APCD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	27.00	Acre	27.00	1,176,120.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Proposed Undergroud Pipelines/Trenching [Transmission Facility, Table 2.4-2]

Land Use - Per AVEK AECOM AQ technical memo, 27 acres for this phase

Construction Phase - Per project schedule, estimated construction is from August 2022 through September 2023

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 graders (174 hp, 6 hours per day)
3 belly scraper (313 hp, 4 hours per day)
2 wheeled loaders (165 hp, 8 hours per day)

AVEK - Transmission Facility - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 cranes (190 hp, 2 hours per day)
2 hydraulic excavators (180 hp, 6 hours per day)
2 graders (174 hp, 6 hours per day)
1 off-highway truck (479 hp, 4 hours per day)
2 water trucks (200 hp, 4 hours per day)
3 belly scrapers (313 hp, 4 hours per day)
2 wheeled loaders (165 hp, 8 hours per day)
1 skip loader (88 hp, 3 hours per day)
4 backhoes (108 hp, 5 hours per day)

Grading - Excess spoil from excavation operations will be incorporated into the recharge basin berms and thus will not be hauled off site.

Trips and VMT - Per AECOM 2017 Air Quality Report, 60 worker trips and 4 delivery trips at 60 miles in length

Construction Off-road Equipment Mitigation - Per AVEK AECOM 2017 technical memorandum, AQ-1 mitigation measure applied.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	45.00	305.00
tblConstructionPhase	PhaseEndDate	9/30/2022	9/30/2023
tblConstructionPhase	PhaseEndDate	9/30/2022	9/30/2023

AVEK - Transmission Facility - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblConstructionPhase	PhaseStartDate	10/1/2022	8/1/2022
tblGrading	AcresOfGrading	686.25	27.00
tblOffRoadEquipment	HorsePower	187.00	174.00
tblOffRoadEquipment	HorsePower	367.00	313.00
tblOffRoadEquipment	HorsePower	97.00	165.00
tblOffRoadEquipment	HorsePower	231.00	190.00
tblOffRoadEquipment	HorsePower	158.00	180.00
tblOffRoadEquipment	HorsePower	402.00	479.00
tblOffRoadEquipment	HorsePower	402.00	200.00
tblOffRoadEquipment	HorsePower	65.00	88.00
tblOffRoadEquipment	HorsePower	97.00	108.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

AVEK - Transmission Facility - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	4.4702	38.7147	42.3320	0.0992	2.5043	1.6897	4.1940	0.6542	1.5551	2.2092	0.0000	9,752.3479	9,752.3479	2.3780	0.1424	9,854.2436
2023	4.1504	34.5684	41.1198	0.0985	2.5043	1.4846	3.9889	0.6542	1.3661	2.0202	0.0000	9,682.1815	9,682.1815	2.3731	0.1338	9,781.3840
Maximum	**4.4702**	**38.7147**	**42.3320**	**0.0992**	**2.5043**	**1.6897**	**4.1940**	**0.6542**	**1.5551**	**2.2092**	**0.0000**	**9,752.3479**	**9,752.3479**	**2.3780**	**0.1424**	**9,854.2436**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	1.8396	26.5965	53.7777	0.0992	2.5043	0.1493	2.6536	0.6542	0.1477	0.8018	0.0000	9,752.3479	9,752.3479	2.3780	0.1424	9,854.2436
2023	1.7754	26.2594	53.0510	0.0985	2.5043	0.1401	2.6444	0.6542	0.1389	0.7930	0.0000	9,682.1815	9,682.1815	2.3731	0.1338	9,781.3840
Maximum	**1.8396**	**26.5965**	**53.7777**	**0.0992**	**2.5043**	**0.1493**	**2.6536**	**0.6542**	**0.1477**	**0.8018**	**0.0000**	**9,752.3479**	**9,752.3479**	**2.3780**	**0.1424**	**9,854.2436**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**58.07**	**27.87**	**-28.01**	**0.00**	**0.00**	**90.88**	**35.26**	**0.00**	**90.19**	**62.29**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

AVEK - Transmission Facility - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	8/1/2022	9/30/2023	5	305	
2	Site Preparation	Trenching	8/1/2022	9/30/2023	5	305	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 27

Acres of Paving: 27

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Graders	2	6.00	174	0.41
Grading	Scrapers	3	4.00	313	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	165	0.37
Site Preparation	Cranes	2	2.00	190	0.29
Site Preparation	Excavators	2	6.00	180	0.38
Site Preparation	Off-Highway Trucks	1	4.00	479	0.38
Site Preparation	Off-Highway Trucks	2	4.00	200	0.38
Site Preparation	Skid Steer Loaders	1	3.00	88	0.37
Site Preparation	Tractors/Loaders/Backhoes	4	5.00	108	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	7	18.00	2.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	12	30.00	2.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

AVEK - Transmission Facility - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Use Cleaner Engines for Construction Equipment

3.2 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0939	0.0000	0.0939	0.0101	0.0000	0.0101			0.0000			0.0000
Off-Road	2.3096	23.0008	21.3801	0.0392		1.0714	1.0714		0.9857	0.9857		3,791.5456	3,791.5456	1.2263		3,822.2022
Total	**2.3096**	**23.0008**	**21.3801**	**0.0392**	**0.0939**	**1.0714**	**1.1653**	**0.0101**	**0.9857**	**0.9958**		**3,791.5456**	**3,791.5456**	**1.2263**		**3,822.2022**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0174	0.5930	0.1187	2.9700e-003	0.1110	7.1100e-003	0.1181	0.0319	6.8000e-003	0.0387		313.5629	313.5629	1.7500e-003	0.0452	327.0652
Worker	0.2279	0.2262	2.7423	7.0700e-003	0.8207	4.9600e-003	0.8256	0.2176	4.5700e-003	0.2221		719.2401	719.2401	0.0163	0.0195	725.4714
Total	**0.2453**	**0.8192**	**2.8609**	**0.0100**	**0.9317**	**0.0121**	**0.9437**	**0.2495**	**0.0114**	**0.2609**		**1,032.8030**	**1,032.8030**	**0.0181**	**0.0647**	**1,052.5366**

AVEK - Transmission Facility - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0939	0.0000	0.0939	0.0101	0.0000	0.0101			0.0000			0.0000
Off-Road	0.5604	13.8151	25.2851	0.0392		0.0641	0.0641		0.0641	0.0641	0.0000	3,791.5456	3,791.5456	1.2263		3,822.2022
Total	**0.5604**	**13.8151**	**25.2851**	**0.0392**	**0.0939**	**0.0641**	**0.1580**	**0.0101**	**0.0641**	**0.0743**	**0.0000**	**3,791.5456**	**3,791.5456**	**1.2263**		**3,822.2022**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0174	0.5930	0.1187	2.9700e-003	0.1110	7.1100e-003	0.1181	0.0319	6.8000e-003	0.0387		313.5629	313.5629	1.7500e-003	0.0452	327.0652
Worker	0.2279	0.2262	2.7423	7.0700e-003	0.8207	4.9600e-003	0.8256	0.2176	4.5700e-003	0.2221		719.2401	719.2401	0.0163	0.0195	725.4714
Total	**0.2453**	**0.8192**	**2.8609**	**0.0100**	**0.9317**	**0.0121**	**0.9437**	**0.2495**	**0.0114**	**0.2609**		**1,032.8030**	**1,032.8030**	**0.0181**	**0.0647**	**1,052.5366**

3.2 Grading - 2023

AVEK - Transmission Facility - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0939	0.0000	0.0939	0.0101	0.0000	0.0101			0.0000			0.0000
Off-Road	2.1389	20.5682	20.9902	0.0392		0.9489	0.9489		0.8730	0.8730		3,793.3368	3,793.3368	1.2268		3,824.0079
Total	**2.1389**	**20.5682**	**20.9902**	**0.0392**	**0.0939**	**0.9489**	**1.0428**	**0.0101**	**0.8730**	**0.8832**		**3,793.3368**	**3,793.3368**	**1.2268**		**3,824.0079**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.3800e-003	0.4614	0.0859	2.8600e-003	0.1110	2.8900e-003	0.1139	0.0319	2.7600e-003	0.0347		301.1909	301.1909	1.2400e-003	0.0432	314.0806
Worker	0.2113	0.1985	2.4943	6.8500e-003	0.8207	4.6800e-003	0.8254	0.2176	4.3100e-003	0.2219		700.9326	700.9326	0.0145	0.0178	706.6032
Total	**0.2187**	**0.6599**	**2.5802**	**9.7100e-003**	**0.9317**	**7.5700e-003**	**0.9392**	**0.2495**	**7.0700e-003**	**0.2566**		**1,002.1235**	**1,002.1235**	**0.0157**	**0.0610**	**1,020.6837**

Mitigated Construction On-Site

AVEK - Transmission Facility - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0939	0.0000	0.0939	0.0101	0.0000	0.0101			0.0000			0.0000
Off-Road	0.5604	13.8151	25.2851	0.0392		0.0641	0.0641		0.0641	0.0641	0.0000	3,793.3368	3,793.3368	1.2268		3,824.0079
Total	**0.5604**	**13.8151**	**25.2851**	**0.0392**	**0.0939**	**0.0641**	**0.1580**	**0.0101**	**0.0641**	**0.0743**	**0.0000**	**3,793.3368**	**3,793.3368**	**1.2268**		**3,824.0079**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.3800e-003	0.4614	0.0859	2.8600e-003	0.1110	2.8900e-003	0.1139	0.0319	2.7600e-003	0.0347		301.1909	301.1909	1.2400e-003	0.0432	314.0806
Worker	0.2113	0.1985	2.4943	6.8500e-003	0.8207	4.6800e-003	0.8254	0.2176	4.3100e-003	0.2219		700.9326	700.9326	0.0145	0.0178	706.6032
Total	**0.2187**	**0.6599**	**2.5802**	**9.7100e-003**	**0.9317**	**7.5700e-003**	**0.9392**	**0.2495**	**7.0700e-003**	**0.2566**		**1,002.1235**	**1,002.1235**	**0.0157**	**0.0610**	**1,020.6837**

3.3 Site Preparation - 2022

Unmitigated Construction On-Site

AVEK - Transmission Facility - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5181	13.9247	13.4019	0.0353		0.5909	0.5909		0.5436	0.5436		3,415.7030	3,415.7030	1.1047		3,443.3207
Total	**1.5181**	**13.9247**	**13.4019**	**0.0353**		**0.5909**	**0.5909**		**0.5436**	**0.5436**		**3,415.7030**	**3,415.7030**	**1.1047**		**3,443.3207**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0174	0.5930	0.1187	2.9700e-003	0.1110	7.1100e-003	0.1181	0.0319	6.8000e-003	0.0387		313.5629	313.5629	1.7500e-003	0.0452	327.0652
Worker	0.3798	0.3770	4.5704	0.0118	1.3678	8.2700e-003	1.3761	0.3626	7.6100e-003	0.3702		1,198.7335	1,198.7335	0.0272	0.0326	1,209.1191
Total	**0.3972**	**0.9700**	**4.6891**	**0.0148**	**1.4788**	**0.0154**	**1.4941**	**0.3945**	**0.0144**	**0.4089**		**1,512.2964**	**1,512.2964**	**0.0290**	**0.0777**	**1,536.1842**

Mitigated Construction On-Site

AVEK - Transmission Facility - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6368	10.9923	20.9426	0.0353		0.0578	0.0578		0.0578	0.0578	0.0000	3,415.7030	3,415.7030	1.1047		3,443.3207
Total	**0.6368**	**10.9923**	**20.9426**	**0.0353**		**0.0578**	**0.0578**		**0.0578**	**0.0578**	**0.0000**	**3,415.7030**	**3,415.7030**	**1.1047**		**3,443.3207**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0174	0.5930	0.1187	2.9700e-003	0.1110	7.1100e-003	0.1181	0.0319	6.8000e-003	0.0387		313.5629	313.5629	1.7500e-003	0.0452	327.0652
Worker	0.3798	0.3770	4.5704	0.0118	1.3678	8.2700e-003	1.3761	0.3626	7.6100e-003	0.3702		1,198.7335	1,198.7335	0.0272	0.0326	1,209.1191
Total	**0.3972**	**0.9700**	**4.6891**	**0.0148**	**1.4788**	**0.0154**	**1.4941**	**0.3945**	**0.0144**	**0.4089**		**1,512.2964**	**1,512.2964**	**0.0290**	**0.0777**	**1,536.1842**

3.3 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

AVEK - Transmission Facility - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Off-Road	1.4333	12.5482	13.3063	0.0353		0.5174	0.5174		0.4760	0.4760		3,417.3092	3,417.3092	1.1052		3,444.9399
Total	**1.4333**	**12.5482**	**13.3063**	**0.0353**		**0.5174**	**0.5174**		**0.4760**	**0.4760**		**3,417.3092**	**3,417.3092**	**1.1052**		**3,444.9399**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.3800e-003	0.4614	0.0859	2.8600e-003	0.1110	2.8900e-003	0.1139	0.0319	2.7600e-003	0.0347		301.1909	301.1909	1.2400e-003	0.0432	314.0806
Worker	0.3521	0.3309	4.1572	0.0114	1.3678	7.8000e-003	1.3756	0.3626	7.1800e-003	0.3698		1,168.2211	1,168.2211	0.0241	0.0297	1,177.6720
Total	**0.3595**	**0.7922**	**4.2431**	**0.0143**	**1.4788**	**0.0107**	**1.4895**	**0.3945**	**9.9400e-003**	**0.4045**		**1,469.4120**	**1,469.4120**	**0.0253**	**0.0728**	**1,491.7525**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6368	10.9923	20.9426	0.0353		0.0578	0.0578		0.0578	0.0578	0.0000	3,417.3092	3,417.3092	1.1052		3,444.9399
Total	**0.6368**	**10.9923**	**20.9426**	**0.0353**		**0.0578**	**0.0578**		**0.0578**	**0.0578**	**0.0000**	**3,417.3092**	**3,417.3092**	**1.1052**		**3,444.9399**

AVEK - Transmission Facility - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.3800e-003	0.4614	0.0859	2.8600e-003	0.1110	2.8900e-003	0.1139	0.0319	2.7600e-003	0.0347		301.1909	301.1909	1.2400e-003	0.0432	314.0806
Worker	0.3521	0.3309	4.1572	0.0114	1.3678	7.8000e-003	1.3756	0.3626	7.1800e-003	0.3698		1,168.2211	1,168.2211	0.0241	0.0297	1,177.6720
Total	**0.3595**	**0.7922**	**4.2431**	**0.0143**	**1.4788**	**0.0107**	**1.4895**	**0.3945**	**9.9400e-003**	**0.4045**		**1,469.4120**	**1,469.4120**	**0.0253**	**0.0728**	**1,491.7525**

AVEK - Transmission Facility - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

AVEK - Transmission Facility

Antelope Valley APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	27.00	Acre	27.00	1,176,120.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Proposed Undergroud Pipelines/Trenching [Transmission Facility, Table 2.4-2]

Land Use - Per AVEK AECOM AQ technical memo, 27 acres for this phase

Construction Phase - Per project schedule, estimated construction is from August 2022 through September 2023

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 graders (174 hp, 6 hours per day)
3 belly scraper (313 hp, 4 hours per day)
2 wheeled loaders (165 hp, 8 hours per day)

AVEK - Transmission Facility - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 cranes (190 hp, 2 hours per day)
2 hydraulic excavators (180 hp, 6 hours per day)
2 graders (174 hp, 6 hours per day)
1 off-highway truck (479 hp, 4 hours per day)
2 water trucks (200 hp, 4 hours per day)
3 belly scrapers (313 hp, 4 hours per day)
2 wheeled loaders (165 hp, 8 hours per day)
1 skip loader (88 hp, 3 hours per day)
4 backhoes (108 hp, 5 hours per day)

Grading - Excess spoil from excavation operations will be incorporated into the recharge basin berms and thus will not be hauled off site.

Trips and VMT - Per AECOM 2017 Air Quality Report, 60 worker trips and 4 delivery trips at 60 miles in length

Construction Off-road Equipment Mitigation - Per AVEK AECOM 2017 technical memorandum, AQ-1 mitigation measure applied.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	45.00	305.00
tblConstructionPhase	PhaseEndDate	9/30/2022	9/30/2023
tblConstructionPhase	PhaseEndDate	9/30/2022	9/30/2023

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblConstructionPhase	PhaseStartDate	10/1/2022	8/1/2022
tblGrading	AcresOfGrading	686.25	27.00
tblOffRoadEquipment	HorsePower	187.00	174.00
tblOffRoadEquipment	HorsePower	367.00	313.00
tblOffRoadEquipment	HorsePower	97.00	165.00
tblOffRoadEquipment	HorsePower	231.00	190.00
tblOffRoadEquipment	HorsePower	158.00	180.00
tblOffRoadEquipment	HorsePower	402.00	479.00
tblOffRoadEquipment	HorsePower	402.00	200.00
tblOffRoadEquipment	HorsePower	65.00	88.00
tblOffRoadEquipment	HorsePower	97.00	108.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.2432	2.1322	2.3583	5.4900e-003	0.1443	0.0929	0.2373	0.0363	0.0855	0.1219	0.0000	489.3216	489.3216	0.1187	7.2300e-003	494.4430
2023	0.4001	3.3746	4.0577	9.6500e-003	0.2448	0.1448	0.3895	0.0632	0.1332	0.1964	0.0000	861.0827	861.0827	0.2100	0.0120	869.9170
Maximum	**0.4001**	**3.3746**	**4.0577**	**9.6500e-003**	**0.2448**	**0.1448**	**0.3895**	**0.0632**	**0.1332**	**0.1964**	**0.0000**	**861.0827**	**861.0827**	**0.2100**	**0.0120**	**869.9170**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0985	1.4657	2.9878	5.4900e-003	0.1443	8.2100e-003	0.1525	0.0363	8.1200e-003	0.0445	0.0000	489.3212	489.3212	0.1187	7.2300e-003	494.4425
2023	0.1685	2.5645	5.2209	9.6500e-003	0.2448	0.0137	0.2585	0.0632	0.0135	0.0768	0.0000	861.0819	861.0819	0.2100	0.0120	869.9162
Maximum	**0.1685**	**2.5645**	**5.2209**	**9.6500e-003**	**0.2448**	**0.0137**	**0.2585**	**0.0632**	**0.0135**	**0.0768**	**0.0000**	**861.0819**	**861.0819**	**0.2100**	**0.0120**	**869.9162**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**58.50**	**26.81**	**-27.94**	**0.00**	**0.00**	**90.80**	**34.43**	**0.00**	**90.10**	**61.91**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	8-1-2022	10-31-2022	1.4170	0.9324
2	11-1-2022	1-31-2023	1.3695	0.9299
3	2-1-2023	4-30-2023	1.2299	0.8903

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4	**5-1-2023**	**7-31-2023**	1.2697	0.9187
5	**8-1-2023**	**9-30-2023**	0.8419	0.6091
		Highest	1.4170	0.9324

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	8/1/2022	9/30/2023	5	305	
2	Site Preparation	Trenching	8/1/2022	9/30/2023	5	305	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 27

Acres of Paving: 27

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Graders	2	6.00	174	0.41
Grading	Scrapers	3	4.00	313	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	165	0.37
Site Preparation	Cranes	2	2.00	190	0.29
Site Preparation	Excavators	2	6.00	180	0.38
Site Preparation	Off-Highway Trucks	1	4.00	479	0.38
Site Preparation	Off-Highway Trucks	2	4.00	200	0.38
Site Preparation	Skid Steer Loaders	1	3.00	88	0.37
Site Preparation	Tractors/Loaders/Backhoes	4	5.00	108	0.37

Trips and VMT

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Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	7	18.00	2.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	12	30.00	2.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0143	0.0000	0.0143	1.5500e-003	0.0000	1.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1270	1.2651	1.1759	2.1500e-003		0.0589	0.0589		0.0542	0.0542	0.0000	189.1798	189.1798	0.0612	0.0000	190.7094
Total	**0.1270**	**1.2651**	**1.1759**	**2.1500e-003**	**0.0143**	**0.0589**	**0.0733**	**1.5500e-003**	**0.0542**	**0.0558**	**0.0000**	**189.1798**	**189.1798**	**0.0612**	**0.0000**	**190.7094**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

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Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5000e-004	0.0330	6.4900e-003	1.6000e-004	6.0100e-003	3.9000e-004	6.4000e-003	1.7300e-003	3.7000e-004	2.1000e-003	0.0000	15.6435	15.6435	9.0000e-005	2.2500e-003	16.3172
Worker	0.0115	0.0132	0.1621	4.0000e-004	0.0443	2.7000e-004	0.0445	0.0118	2.5000e-004	0.0120	0.0000	36.9105	36.9105	8.4000e-004	1.0200e-003	37.2353
Total	**0.0125**	**0.0462**	**0.1686**	**5.6000e-004**	**0.0503**	**6.6000e-004**	**0.0509**	**0.0135**	**6.2000e-004**	**0.0141**	**0.0000**	**52.5539**	**52.5539**	**9.3000e-004**	**3.2700e-003**	**53.5525**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0143	0.0000	0.0143	1.5500e-003	0.0000	1.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0308	0.7598	1.3907	2.1500e-003		3.5300e-003	3.5300e-003		3.5300e-003	3.5300e-003	0.0000	189.1796	189.1796	0.0612	0.0000	190.7092
Total	**0.0308**	**0.7598**	**1.3907**	**2.1500e-003**	**0.0143**	**3.5300e-003**	**0.0179**	**1.5500e-003**	**3.5300e-003**	**5.0800e-003**	**0.0000**	**189.1796**	**189.1796**	**0.0612**	**0.0000**	**190.7092**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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Vendor	9.5000e-004	0.0330	6.4900e-003	1.6000e-004	6.0100e-003	3.9000e-004	6.4000e-003	1.7300e-003	3.7000e-004	2.1000e-003	0.0000	15.6435	15.6435	9.0000e-005	2.2500e-003	16.3172
Worker	0.0115	0.0132	0.1621	4.0000e-004	0.0443	2.7000e-004	0.0445	0.0118	2.5000e-004	0.0120	0.0000	36.9105	36.9105	8.4000e-004	1.0200e-003	37.2353
Total	**0.0125**	**0.0462**	**0.1686**	**5.6000e-004**	**0.0503**	**6.6000e-004**	**0.0509**	**0.0135**	**6.2000e-004**	**0.0141**	**0.0000**	**52.5539**	**52.5539**	**9.3000e-004**	**3.2700e-003**	**53.5525**

3.2 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0143	0.0000	0.0143	1.5500e-003	0.0000	1.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2085	2.0054	2.0465	3.8200e-003		0.0925	0.0925		0.0851	0.0851	0.0000	335.5226	335.5226	0.1085	0.0000	338.2355
Total	**0.2085**	**2.0054**	**2.0465**	**3.8200e-003**	**0.0143**	**0.0925**	**0.1068**	**1.5500e-003**	**0.0851**	**0.0867**	**0.0000**	**335.5226**	**335.5226**	**0.1085**	**0.0000**	**338.2355**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.2000e-004	0.0455	8.3200e-003	2.8000e-004	0.0107	2.8000e-004	0.0109	3.0700e-003	2.7000e-004	3.3400e-003	0.0000	26.6350	26.6350	1.1000e-004	3.8200e-003	27.7751

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Worker	0.0189	0.0206	0.2614	6.9000e-004	0.0784	4.6000e-004	0.0789	0.0208	4.2000e-004	0.0213	0.0000	63.7603	63.7603	1.3100e-003	1.6500e-003	64.2843
Total	**0.0196**	**0.0660**	**0.2697**	**9.7000e-004**	**0.0891**	**7.4000e-004**	**0.0898**	**0.0239**	**6.9000e-004**	**0.0246**	**0.0000**	**90.3953**	**90.3953**	**1.4200e-003**	**5.4700e-003**	**92.0593**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0143	0.0000	0.0143	1.5500e-003	0.0000	1.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0546	1.3470	2.4653	3.8200e-003		6.2500e-003	6.2500e-003		6.2500e-003	6.2500e-003	0.0000	335.5222	335.5222	0.1085	0.0000	338.2351
Total	**0.0546**	**1.3470**	**2.4653**	**3.8200e-003**	**0.0143**	**6.2500e-003**	**0.0206**	**1.5500e-003**	**6.2500e-003**	**7.8000e-003**	**0.0000**	**335.5222**	**335.5222**	**0.1085**	**0.0000**	**338.2351**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.2000e-004	0.0455	8.3200e-003	2.8000e-004	0.0107	2.8000e-004	0.0109	3.0700e-003	2.7000e-004	3.3400e-003	0.0000	26.6350	26.6350	1.1000e-004	3.8200e-003	27.7751
Worker	0.0189	0.0206	0.2614	6.9000e-004	0.0784	4.6000e-004	0.0789	0.0208	4.2000e-004	0.0213	0.0000	63.7603	63.7603	1.3100e-003	1.6500e-003	64.2843

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Total	**0.0196**	**0.0660**	**0.2697**	**9.7000e-004**	**0.0891**	**7.4000e-004**	**0.0898**	**0.0239**	**6.9000e-004**	**0.0246**	**0.0000**	**90.3953**	**90.3953**	**1.4200e-003**	**5.4700e-003**	**92.0593**

3.3 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0835	0.7659	0.7371	1.9400e-003		0.0325	0.0325		0.0299	0.0299	0.0000	170.4271	170.4271	0.0551	0.0000	171.8050
Total	**0.0835**	**0.7659**	**0.7371**	**1.9400e-003**		**0.0325**	**0.0325**		**0.0299**	**0.0299**	**0.0000**	**170.4271**	**170.4271**	**0.0551**	**0.0000**	**171.8050**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5000e-004	0.0330	6.4900e-003	1.6000e-004	6.0100e-003	3.9000e-004	6.4000e-003	1.7300e-003	3.7000e-004	2.1000e-003	0.0000	15.6435	15.6435	9.0000e-005	2.2500e-003	16.3172
Worker	0.0192	0.0220	0.2702	6.7000e-004	0.0738	4.5000e-004	0.0742	0.0196	4.2000e-004	0.0200	0.0000	61.5174	61.5174	1.4000e-003	1.7000e-003	62.0588
Total	**0.0202**	**0.0550**	**0.2767**	**8.3000e-004**	**0.0798**	**8.4000e-004**	**0.0806**	**0.0213**	**7.9000e-004**	**0.0221**	**0.0000**	**77.1609**	**77.1609**	**1.4900e-003**	**3.9500e-003**	**78.3760**

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Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0350	0.6046	1.1518	1.9400e-003		3.1800e-003	3.1800e-003		3.1800e-003	3.1800e-003	0.0000	170.4269	170.4269	0.0551	0.0000	171.8048
Total	**0.0350**	**0.6046**	**1.1518**	**1.9400e-003**		**3.1800e-003**	**3.1800e-003**		**3.1800e-003**	**3.1800e-003**	**0.0000**	**170.4269**	**170.4269**	**0.0551**	**0.0000**	**171.8048**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5000e-004	0.0330	6.4900e-003	1.6000e-004	6.0100e-003	3.9000e-004	6.4000e-003	1.7300e-003	3.7000e-004	2.1000e-003	0.0000	15.6435	15.6435	9.0000e-005	2.2500e-003	16.3172
Worker	0.0192	0.0220	0.2702	6.7000e-004	0.0738	4.5000e-004	0.0742	0.0196	4.2000e-004	0.0200	0.0000	61.5174	61.5174	1.4000e-003	1.7000e-003	62.0588
Total	**0.0202**	**0.0550**	**0.2767**	**8.3000e-004**	**0.0798**	**8.4000e-004**	**0.0806**	**0.0213**	**7.9000e-004**	**0.0221**	**0.0000**	**77.1609**	**77.1609**	**1.4900e-003**	**3.9500e-003**	**78.3760**

3.3 Site Preparation - 2023

Unmitigated Construction On-Site

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1398	1.2235	1.2974	3.4400e-003		0.0505	0.0505		0.0464	0.0464	0.0000	302.2628	302.2628	0.0978	0.0000	304.7067
Total	**0.1398**	**1.2235**	**1.2974**	**3.4400e-003**		**0.0505**	**0.0505**		**0.0464**	**0.0464**	**0.0000**	**302.2628**	**302.2628**	**0.0978**	**0.0000**	**304.7067**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.2000e-004	0.0455	8.3200e-003	2.8000e-004	0.0107	2.8000e-004	0.0109	3.0700e-003	2.7000e-004	3.3400e-003	0.0000	26.6350	26.6350	1.1000e-004	3.8200e-003	27.7751
Worker	0.0315	0.0343	0.4357	1.1400e-003	0.1307	7.6000e-004	0.1315	0.0347	7.0000e-004	0.0354	0.0000	106.2671	106.2671	2.1900e-003	2.7500e-003	107.1404
Total	**0.0322**	**0.0798**	**0.4440**	**1.4200e-003**	**0.1414**	**1.0400e-003**	**0.1424**	**0.0378**	**9.7000e-004**	**0.0388**	**0.0000**	**132.9021**	**132.9021**	**2.3000e-003**	**6.5700e-003**	**134.9155**

Mitigated Construction On-Site

AVEK - Transmission Facility - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0621	1.0718	2.0419	3.4400e-003		5.6300e-003	5.6300e-003		5.6300e-003	5.6300e-003	0.0000	302.2624	302.2624	0.0978	0.0000	304.7063
Total	**0.0621**	**1.0718**	**2.0419**	**3.4400e-003**		**5.6300e-003**	**5.6300e-003**		**5.6300e-003**	**5.6300e-003**	**0.0000**	**302.2624**	**302.2624**	**0.0978**	**0.0000**	**304.7063**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.2000e-004	0.0455	8.3200e-003	2.8000e-004	0.0107	2.8000e-004	0.0109	3.0700e-003	2.7000e-004	3.3400e-003	0.0000	26.6350	26.6350	1.1000e-004	3.8200e-003	27.7751
Worker	0.0315	0.0343	0.4357	1.1400e-003	0.1307	7.6000e-004	0.1315	0.0347	7.0000e-004	0.0354	0.0000	106.2671	106.2671	2.1900e-003	2.7500e-003	107.1404
Total	**0.0322**	**0.0798**	**0.4440**	**1.4200e-003**	**0.1414**	**1.0400e-003**	**0.1424**	**0.0378**	**9.7000e-004**	**0.0388**	**0.0000**	**132.9021**	**132.9021**	**2.3000e-003**	**6.5700e-003**	**134.9155**

Appendix C

CalEEMod Outputs – Activity 4

AVEK - Recharge Facility - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

AVEK - Recharge Facility

Antelope Valley APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	890.00	Acre	890.00	38,768,400.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Proposed Recharge Basin, Grading, Above-ground Pipeline Install [Recharge Facility, Table 2.4-3]

Land Use - Per AVEK AECOM AQ technical memo, 890 acres for this phase

Construction Phase - Per project schedule, estimated construction is from December 2021 through April 2024.

Off-road Equipment - Per project description -
2 backhoes (108 hp, 5 hours per day)
2 graders (174 hp, 6 hours per day)
2 off-highway truck (479 hp, 4 hours per day)
2 water trucks (200 hp, 4 hours per day)
6 belly scrapers (313 hp, 6 hours per day)
2 wheeled loaders (165 hp, 6 hours per day)
2 skip loaders (88 hp, 3 hours per day)
Grading - Excess spoil from excavation operations will incorporated into the recharge basin berms and thus will not be hauled off site.

Trips and VMT - Per the project description, 60 worker trips per day at 60 miles in length.

Construction Off-road Equipment Mitigation - Per AVEK AECOM 2017 technical memorandum, AQ-1 mitigation measure applied.

AVEK - Recharge Facility - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	1,395.00	630.00
tblConstructionPhase	PhaseEndDate	4/6/2027	4/30/2024
tblGrading	AcresOfGrading	3,307.50	890.00
tblOffRoadEquipment	HorsePower	187.00	174.00
tblOffRoadEquipment	HorsePower	367.00	313.00
tblOffRoadEquipment	HorsePower	97.00	108.00
tblOffRoadEquipment	HorsePower	97.00	165.00
tblOffRoadEquipment	HorsePower	402.00	479.00
tblOffRoadEquipment	HorsePower	402.00	200.00
tblOffRoadEquipment	HorsePower	65.00	88.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	WorkerTripLength	16.80	60.00

AVEK - Recharge Facility - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	6.8913	66.9089	59.2314	0.1245	3.5498	2.8260	6.3759	0.7057	2.5999	3.3057	0.0000	12,143.5460	12,143.5460	3.3083	0.0522	12,241.7962
2022	6.0856	55.7024	55.3015	0.1240	3.5498	2.3488	5.8986	0.7057	2.1609	2.8666	0.0000	12,098.7495	12,098.7495	3.3054	0.0473	12,195.4922
2023	5.7333	50.6318	53.3840	0.1234	3.5498	2.1185	5.6683	0.7057	1.9490	2.6547	0.0000	12,048.7645	12,048.7645	3.3008	0.0432	12,144.1512
2024	5.5004	46.8537	51.7779	0.1228	3.5498	1.9575	5.5074	0.7057	1.8009	2.5066	0.0000	12,009.2183	12,009.2183	3.2951	0.0395	12,103.3765
Maximum	**6.8913**	**66.9089**	**59.2314**	**0.1245**	**3.5498**	**2.8260**	**6.3759**	**0.7057**	**2.5999**	**3.3057**	**0.0000**	**12,143.5460**	**12,143.5460**	**3.3083**	**0.0522**	**12,241.7962**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.2925	32.2027	70.6268	0.1245	3.5498	0.1835	3.7334	0.7057	0.1825	0.8882	0.0000	12,143.5460	12,143.5460	3.3083	0.0522	12,241.7962
2022	2.2428	32.1259	69.6736	0.1240	3.5498	0.1827	3.7326	0.7057	0.1817	0.8874	0.0000	12,098.7495	12,098.7495	3.3054	0.0473	12,195.4922
2023	2.1985	32.0604	68.8579	0.1234	3.5498	0.1820	3.7319	0.7057	0.1811	0.8868	0.0000	12,048.7645	12,048.7645	3.3008	0.0432	12,144.1512

AVEK - Recharge Facility - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2024	2.1582	32.0046	67.9786	0.1228	3.5498	0.1813	3.7312	0.7057	0.1805	0.8862	0.0000	12,009.2183	12,009.2183	3.2951	0.0395	12,103.3765
Maximum	**2.2925**	**32.2027**	**70.6268**	**0.1245**	**3.5498**	**0.1835**	**3.7334**	**0.7057**	**0.1825**	**0.8882**	**0.0000**	**12,143.5460**	**12,143.5460**	**3.3083**	**0.0522**	**12,241.7962**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**63.27**	**41.66**	**-26.15**	**0.00**	**0.00**	**92.11**	**36.34**	**0.00**	**91.47**	**68.69**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	12/1/2021	4/30/2024	5	630	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 890

Acres of Paving: 890

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Graders	2	6.00	174	0.41
Grading	Off-Highway Trucks	2	4.00	479	0.38
Grading	Off-Highway Trucks	2	4.00	200	0.38
Grading	Scrapers	6	6.00	313	0.48
Grading	Skid Steer Loaders	2	3.00	88	0.37
Grading	Tractors/Loaders/Backhoes	2	5.00	108	0.37

AVEK - Recharge Facility - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Grading	Tractors/Loaders/Backhoes	2	6.00	165	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	18	45.00	0.00	0.00	60.00	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	6.2713	66.2958	49.2511	0.1040		2.8128	2.8128		2.5878	2.5878		10,067.6353	10,067.6353	3.2561		10,149.0372
Total	**6.2713**	**66.2958**	**49.2511**	**0.1040**	**1.4982**	**2.8128**	**4.3110**	**0.1618**	**2.5878**	**2.7496**		**10,067.6353**	**10,067.6353**	**3.2561**		**10,149.0372**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

AVEK - Recharge Facility - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.6200	0.6131	9.9804	0.0205	2.0517	0.0132	2.0649	0.5439	0.0122	0.5561		2,075.9108	2,075.9108	0.0522	0.0522	2,092.7591
Total	**0.6200**	**0.6131**	**9.9804**	**0.0205**	**2.0517**	**0.0132**	**2.0649**	**0.5439**	**0.0122**	**0.5561**		**2,075.9108**	**2,075.9108**	**0.0522**	**0.0522**	**2,092.7591**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	1.6724	31.5896	60.6464	0.1040		0.1703	0.1703		0.1703	0.1703	0.0000	10,067.6352	10,067.6352	3.2561		10,149.0372
Total	**1.6724**	**31.5896**	**60.6464**	**0.1040**	**1.4982**	**0.1703**	**1.6685**	**0.1618**	**0.1703**	**0.3321**	**0.0000**	**10,067.6352**	**10,067.6352**	**3.2561**		**10,149.0372**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

AVEK - Recharge Facility - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.6200	0.6131	9.9804	0.0205	2.0517	0.0132	2.0649	0.5439	0.0122	0.5561		2,075.9108	2,075.9108	0.0522	0.0522	2,092.7591
Total	**0.6200**	**0.6131**	**9.9804**	**0.0205**	**2.0517**	**0.0132**	**2.0649**	**0.5439**	**0.0122**	**0.5561**		**2,075.9108**	**2,075.9108**	**0.0522**	**0.0522**	**2,092.7591**

3.2 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	5.5152	55.1661	46.2743	0.1041		2.3364	2.3364		2.1495	2.1495		10,077.7319	10,077.7319	3.2593		10,159.2155
Total	**5.5152**	**55.1661**	**46.2743**	**0.1041**	**1.4982**	**2.3364**	**3.8346**	**0.1618**	**2.1495**	**2.3113**		**10,077.7319**	**10,077.7319**	**3.2593**		**10,159.2155**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

AVEK - Recharge Facility - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.5704	0.5363	9.0272	0.0199	2.0517	0.0124	2.0641	0.5439	0.0114	0.5554		2,021.0176	2,021.0176	0.0460	0.0473	2,036.2767
Total	**0.5704**	**0.5363**	**9.0272**	**0.0199**	**2.0517**	**0.0124**	**2.0641**	**0.5439**	**0.0114**	**0.5554**		**2,021.0176**	**2,021.0176**	**0.0460**	**0.0473**	**2,036.2767**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	1.6724	31.5896	60.6464	0.1041		0.1703	0.1703		0.1703	0.1703	0.0000	10,077.7319	10,077.7319	3.2593		10,159.2154
Total	**1.6724**	**31.5896**	**60.6464**	**0.1041**	**1.4982**	**0.1703**	**1.6685**	**0.1618**	**0.1703**	**0.3321**	**0.0000**	**10,077.7319**	**10,077.7319**	**3.2593**		**10,159.2154**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

AVEK - Recharge Facility - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Worker	0.5704	0.5363	9.0272	0.0199	2.0517	0.0124	2.0641	0.5439	0.0114	0.5554		2,021.0176	2,021.0176	0.0460	0.0473	2,036.2767
Total	**0.5704**	**0.5363**	**9.0272**	**0.0199**	**2.0517**	**0.0124**	**2.0641**	**0.5439**	**0.0114**	**0.5554**		**2,021.0176**	**2,021.0176**	**0.0460**	**0.0473**	**2,036.2767**

3.2 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	5.2072	50.1610	45.1725	0.1041		2.1068	2.1068		1.9382	1.9382		10,079.9676	10,079.9676	3.2601		10,161.4693
Total	**5.2072**	**50.1610**	**45.1725**	**0.1041**	**1.4982**	**2.1068**	**3.6049**	**0.1618**	**1.9382**	**2.1000**		**10,079.9676**	**10,079.9676**	**3.2601**		**10,161.4693**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.5261	0.4709	8.2115	0.0192	2.0517	0.0117	2.0634	0.5439	0.0108	0.5547		1,968.7969	1,968.7969	0.0407	0.0432	1,982.6820

AVEK - Recharge Facility - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Total	**0.5261**	**0.4709**	**8.2115**	**0.0192**	**2.0517**	**0.0117**	**2.0634**	**0.5439**	**0.0108**	**0.5547**		**1,968.7969**	**1,968.7969**	**0.0407**	**0.0432**	**1,982.6820**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	1.6724	31.5896	60.6464	0.1041		0.1703	0.1703		0.1703	0.1703	0.0000	10,079.9676	10,079.9676	3.2601		10,161.4692
Total	**1.6724**	**31.5896**	**60.6464**	**0.1041**	**1.4982**	**0.1703**	**1.6685**	**0.1618**	**0.1703**	**0.3321**	**0.0000**	**10,079.9676**	**10,079.9676**	**3.2601**		**10,161.4692**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.5261	0.4709	8.2115	0.0192	2.0517	0.0117	2.0634	0.5439	0.0108	0.5547		1,968.7969	1,968.7969	0.0407	0.0432	1,982.6820
Total	**0.5261**	**0.4709**	**8.2115**	**0.0192**	**2.0517**	**0.0117**	**2.0634**	**0.5439**	**0.0108**	**0.5547**		**1,968.7969**	**1,968.7969**	**0.0407**	**0.0432**	**1,982.6820**

AVEK - Recharge Facility - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	5.0146	46.4387	44.4457	0.1041		1.9465	1.9465		1.7908	1.7908		10,077.4650	10,077.4650	3.2593		10,158.9464
Total	**5.0146**	**46.4387**	**44.4457**	**0.1041**	**1.4982**	**1.9465**	**3.4447**	**0.1618**	**1.7908**	**1.9526**		**10,077.4650**	**10,077.4650**	**3.2593**		**10,158.9464**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.4858	0.4150	7.3322	0.0187	2.0517	0.0110	2.0627	0.5439	0.0102	0.5541		1,931.7532	1,931.7532	0.0358	0.0395	1,944.4301
Total	**0.4858**	**0.4150**	**7.3322**	**0.0187**	**2.0517**	**0.0110**	**2.0627**	**0.5439**	**0.0102**	**0.5541**		**1,931.7532**	**1,931.7532**	**0.0358**	**0.0395**	**1,944.4301**

AVEK - Recharge Facility - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	1.6724	31.5896	60.6464	0.1041		0.1703	0.1703		0.1703	0.1703	0.0000	10,077.4650	10,077.4650	3.2593		10,158.9464
Total	**1.6724**	**31.5896**	**60.6464**	**0.1041**	**1.4982**	**0.1703**	**1.6685**	**0.1618**	**0.1703**	**0.3321**	**0.0000**	**10,077.4650**	**10,077.4650**	**3.2593**		**10,158.9464**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.4858	0.4150	7.3322	0.0187	2.0517	0.0110	2.0627	0.5439	0.0102	0.5541		1,931.7532	1,931.7532	0.0358	0.0395	1,944.4301
Total	**0.4858**	**0.4150**	**7.3322**	**0.0187**	**2.0517**	**0.0110**	**2.0627**	**0.5439**	**0.0102**	**0.5541**		**1,931.7532**	**1,931.7532**	**0.0358**	**0.0395**	**1,944.4301**

AVEK - Recharge Facility - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

AVEK - Recharge Facility

Antelope Valley APCD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	890.00	Acre	890.00	38,768,400.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Proposed Recharge Basin, Grading, Above-ground Pipeline Install [Recharge Facility, Table 2.4-3]

Land Use - Per AVEK AECOM AQ technical memo, 890 acres for this phase

Construction Phase - Per project schedule, estimated construction is from December 2021 through April 2024.

Off-road Equipment - Per project description -
2 backhoes (108 hp, 5 hours per day)
2 graders (174 hp, 6 hours per day)
2 off-highway truck (479 hp, 4 hours per day)
2 water trucks (200 hp, 4 hours per day)
6 belly scrapers (313 hp, 6 hours per day)
2 wheeled loaders (165 hp, 6 hours per day)
2 skip loaders (88 hp, 3 hours per day)

Grading - Excess spoil from excavation operations will incorporated into the recharge basin berms and thus will not be hauled off site.

Trips and VMT - Per the project description, 60 worker trips per day at 60 miles in length.

Construction Off-road Equipment Mitigation - Per AVEK AECOM 2017 technical memorandum, AQ-1 mitigation measure applied.

AVEK - Recharge Facility - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	1,395.00	630.00
tblConstructionPhase	PhaseEndDate	4/6/2027	4/30/2024
tblGrading	AcresOfGrading	3,307.50	890.00
tblOffRoadEquipment	HorsePower	187.00	174.00
tblOffRoadEquipment	HorsePower	367.00	313.00
tblOffRoadEquipment	HorsePower	97.00	108.00
tblOffRoadEquipment	HorsePower	97.00	165.00
tblOffRoadEquipment	HorsePower	402.00	479.00
tblOffRoadEquipment	HorsePower	402.00	200.00
tblOffRoadEquipment	HorsePower	65.00	88.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	WorkerTripLength	16.80	60.00

AVEK - Recharge Facility - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	6.8874	66.9423	56.8307	0.1222	3.5498	2.8260	6.3759	0.7057	2.5999	3.3057	0.0000	11,913.7782	11,913.7782	3.3023	0.0538	12,012.3802
2022	6.0849	55.7315	53.1299	0.1218	3.5498	2.3488	5.8986	0.7057	2.1609	2.8666	0.0000	11,875.8321	11,875.8321	3.3002	0.0489	11,972.8940
2023	5.7354	50.6573	51.4083	0.1212	3.5498	2.1185	5.6683	0.7057	1.9490	2.6547	0.0000	11,832.2992	11,832.2992	3.2962	0.0445	11,927.9772
2024	5.5051	46.8761	50.0202	0.1208	3.5498	1.9575	5.5074	0.7057	1.8009	2.5066	0.0000	11,797.5900	11,797.5900	3.2912	0.0408	11,892.0204
Maximum	**6.8874**	**66.9423**	**56.8307**	**0.1222**	**3.5498**	**2.8260**	**6.3759**	**0.7057**	**2.5999**	**3.3057**	**0.0000**	**11,913.7782**	**11,913.7782**	**3.3023**	**0.0538**	**12,012.3802**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.2885	32.2361	68.2261	0.1222	3.5498	0.1835	3.7334	0.7057	0.1825	0.8882	0.0000	11,913.7782	11,913.7782	3.3023	0.0538	12,012.3802
2022	2.2421	32.1550	67.5021	0.1218	3.5498	0.1827	3.7326	0.7057	0.1817	0.8874	0.0000	11,875.8321	11,875.8321	3.3002	0.0489	11,972.8940
2023	2.2006	32.0859	66.8822	0.1212	3.5498	0.1820	3.7319	0.7057	0.1811	0.8868	0.0000	11,832.2992	11,832.2992	3.2962	0.0445	11,927.9772

AVEK - Recharge Facility - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2024	2.1629	32.0270	66.2209	0.1208	3.5498	0.1813	3.7312	0.7057	0.1805	0.8862	0.0000	11,797.5900	11,797.5900	3.2912	0.0408	11,892.0204
Maximum	**2.2885**	**32.2361**	**68.2261**	**0.1222**	**3.5498**	**0.1835**	**3.7334**	**0.7057**	**0.1825**	**0.8882**	**0.0000**	**11,913.7782**	**11,913.7782**	**3.3023**	**0.0538**	**12,012.3802**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**63.27**	**41.64**	**-27.17**	**0.00**	**0.00**	**92.11**	**36.34**	**0.00**	**91.47**	**68.69**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	12/1/2021	4/30/2024	5	630	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 890

Acres of Paving: 890

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Graders	2	6.00	174	0.41
Grading	Off-Highway Trucks	2	4.00	479	0.38
Grading	Off-Highway Trucks	2	4.00	200	0.38
Grading	Scrapers	6	6.00	313	0.48
Grading	Skid Steer Loaders	2	3.00	88	0.37
Grading	Tractors/Loaders/Backhoes	2	5.00	108	0.37

AVEK - Recharge Facility - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Grading	Tractors/Loaders/Backhoes	2	6.00	165	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	18	45.00	0.00	0.00	60.00	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	6.2713	66.2958	49.2511	0.1040		2.8128	2.8128		2.5878	2.5878		10,067.6353	10,067.6353	3.2561		10,149.0372
Total	**6.2713**	**66.2958**	**49.2511**	**0.1040**	**1.4982**	**2.8128**	**4.3110**	**0.1618**	**2.5878**	**2.7496**		**10,067.6353**	**10,067.6353**	**3.2561**		**10,149.0372**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

AVEK - Recharge Facility - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.6161	0.6465	7.5796	0.0182	2.0517	0.0132	2.0649	0.5439	0.0122	0.5561		1,846.1429	1,846.1429	0.0462	0.0538	1,863.3430
Total	**0.6161**	**0.6465**	**7.5796**	**0.0182**	**2.0517**	**0.0132**	**2.0649**	**0.5439**	**0.0122**	**0.5561**		**1,846.1429**	**1,846.1429**	**0.0462**	**0.0538**	**1,863.3430**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	1.6724	31.5896	60.6464	0.1040		0.1703	0.1703		0.1703	0.1703	0.0000	10,067.6352	10,067.6352	3.2561		10,149.0372
Total	**1.6724**	**31.5896**	**60.6464**	**0.1040**	**1.4982**	**0.1703**	**1.6685**	**0.1618**	**0.1703**	**0.3321**	**0.0000**	**10,067.6352**	**10,067.6352**	**3.2561**		**10,149.0372**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

AVEK - Recharge Facility - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.6161	0.6465	7.5796	0.0182	2.0517	0.0132	2.0649	0.5439	0.0122	0.5561		1,846.1429	1,846.1429	0.0462	0.0538	1,863.3430
Total	**0.6161**	**0.6465**	**7.5796**	**0.0182**	**2.0517**	**0.0132**	**2.0649**	**0.5439**	**0.0122**	**0.5561**		**1,846.1429**	**1,846.1429**	**0.0462**	**0.0538**	**1,863.3430**

3.2 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	5.5152	55.1661	46.2743	0.1041		2.3364	2.3364		2.1495	2.1495		10,077.7319	10,077.7319	3.2593		10,159.2155
Total	**5.5152**	**55.1661**	**46.2743**	**0.1041**	**1.4982**	**2.3364**	**3.8346**	**0.1618**	**2.1495**	**2.3113**		**10,077.7319**	**10,077.7319**	**3.2593**		**10,159.2155**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

AVEK - Recharge Facility - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.5697	0.5655	6.8557	0.0177	2.0517	0.0124	2.0641	0.5439	0.0114	0.5554		1,798.1002	1,798.1002	0.0408	0.0489	1,813.6786
Total	**0.5697**	**0.5655**	**6.8557**	**0.0177**	**2.0517**	**0.0124**	**2.0641**	**0.5439**	**0.0114**	**0.5554**		**1,798.1002**	**1,798.1002**	**0.0408**	**0.0489**	**1,813.6786**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	1.6724	31.5896	60.6464	0.1041		0.1703	0.1703		0.1703	0.1703	0.0000	10,077.7319	10,077.7319	3.2593		10,159.2154
Total	**1.6724**	**31.5896**	**60.6464**	**0.1041**	**1.4982**	**0.1703**	**1.6685**	**0.1618**	**0.1703**	**0.3321**	**0.0000**	**10,077.7319**	**10,077.7319**	**3.2593**		**10,159.2154**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

AVEK - Recharge Facility - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Worker	0.5697	0.5655	6.8557	0.0177	2.0517	0.0124	2.0641	0.5439	0.0114	0.5554		1,798.1002	1,798.1002	0.0408	0.0489	1,813.6786
Total	**0.5697**	**0.5655**	**6.8557**	**0.0177**	**2.0517**	**0.0124**	**2.0641**	**0.5439**	**0.0114**	**0.5554**		**1,798.1002**	**1,798.1002**	**0.0408**	**0.0489**	**1,813.6786**

3.2 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	5.2072	50.1610	45.1725	0.1041		2.1068	2.1068		1.9382	1.9382		10,079.9676	10,079.9676	3.2601		10,161.4693
Total	**5.2072**	**50.1610**	**45.1725**	**0.1041**	**1.4982**	**2.1068**	**3.6049**	**0.1618**	**1.9382**	**2.1000**		**10,079.9676**	**10,079.9676**	**3.2601**		**10,161.4693**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.5282	0.4963	6.2358	0.0171	2.0517	0.0117	2.0634	0.5439	0.0108	0.5547		1,752.3316	1,752.3316	0.0361	0.0445	1,766.5079

AVEK - Recharge Facility - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Total	**0.5282**	**0.4963**	**6.2358**	**0.0171**	**2.0517**	**0.0117**	**2.0634**	**0.5439**	**0.0108**	**0.5547**		**1,752.3316**	**1,752.3316**	**0.0361**	**0.0445**	**1,766.5079**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	1.6724	31.5896	60.6464	0.1041		0.1703	0.1703		0.1703	0.1703	0.0000	10,079.9676	10,079.9676	3.2601		10,161.4692
Total	**1.6724**	**31.5896**	**60.6464**	**0.1041**	**1.4982**	**0.1703**	**1.6685**	**0.1618**	**0.1703**	**0.3321**	**0.0000**	**10,079.9676**	**10,079.9676**	**3.2601**		**10,161.4692**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.5282	0.4963	6.2358	0.0171	2.0517	0.0117	2.0634	0.5439	0.0108	0.5547		1,752.3316	1,752.3316	0.0361	0.0445	1,766.5079
Total	**0.5282**	**0.4963**	**6.2358**	**0.0171**	**2.0517**	**0.0117**	**2.0634**	**0.5439**	**0.0108**	**0.5547**		**1,752.3316**	**1,752.3316**	**0.0361**	**0.0445**	**1,766.5079**

AVEK - Recharge Facility - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	5.0146	46.4387	44.4457	0.1041		1.9465	1.9465		1.7908	1.7908		10,077.4650	10,077.4650	3.2593		10,158.9464
Total	**5.0146**	**46.4387**	**44.4457**	**0.1041**	**1.4982**	**1.9465**	**3.4447**	**0.1618**	**1.7908**	**1.9526**		**10,077.4650**	**10,077.4650**	**3.2593**		**10,158.9464**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.4905	0.4375	5.5745	0.0167	2.0517	0.0110	2.0627	0.5439	0.0102	0.5541		1,720.1250	1,720.1250	0.0319	0.0408	1,733.0739
Total	**0.4905**	**0.4375**	**5.5745**	**0.0167**	**2.0517**	**0.0110**	**2.0627**	**0.5439**	**0.0102**	**0.5541**		**1,720.1250**	**1,720.1250**	**0.0319**	**0.0408**	**1,733.0739**

AVEK - Recharge Facility - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.4982	0.0000	1.4982	0.1618	0.0000	0.1618			0.0000			0.0000
Off-Road	1.6724	31.5896	60.6464	0.1041		0.1703	0.1703		0.1703	0.1703	0.0000	10,077.4650	10,077.4650	3.2593		10,158.9464
Total	**1.6724**	**31.5896**	**60.6464**	**0.1041**	**1.4982**	**0.1703**	**1.6685**	**0.1618**	**0.1703**	**0.3321**	**0.0000**	**10,077.4650**	**10,077.4650**	**3.2593**		**10,158.9464**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.4905	0.4375	5.5745	0.0167	2.0517	0.0110	2.0627	0.5439	0.0102	0.5541		1,720.1250	1,720.1250	0.0319	0.0408	1,733.0739
Total	**0.4905**	**0.4375**	**5.5745**	**0.0167**	**2.0517**	**0.0110**	**2.0627**	**0.5439**	**0.0102**	**0.5541**		**1,720.1250**	**1,720.1250**	**0.0319**	**0.0408**	**1,733.0739**

AVEK - Recharge Facility - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

AVEK - Recharge Facility

Antelope Valley APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	890.00	Acre	890.00	38,768,400.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Proposed Recharge Basin, Grading, Above-ground Pipeline Install [Recharge Facility, Table 2.4-3]

Land Use - Per AVEK AECOM AQ technical memo, 890 acres for this phase

Construction Phase - Per project schedule, estimated construction is from December 2021 through April 2024.

Off-road Equipment - Per project description -
2 backhoes (108 hp, 5 hours per day)
2 graders (174 hp, 6 hours per day)
2 off-highway truck (479 hp, 4 hours per day)
2 water trucks (200 hp, 4 hours per day)
6 belly scrapers (313 hp, 6 hours per day)
2 wheeled loaders (165 hp, 6 hours per day)
2 skip loaders (88 hp, 3 hours per day)
Grading - Excess spoil from excavation operations will incorporated into the recharge basin berms and thus will not be hauled off site.

Trips and VMT - Per the project description, 60 worker trips per day at 60 miles in length.

Construction Off-road Equipment Mitigation - Per AVEK AECOM 2017 technical memorandum, AQ-1 mitigation measure applied.

AVEK - Recharge Facility - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	1,395.00	630.00
tblConstructionPhase	PhaseEndDate	4/6/2027	4/30/2024
tblGrading	AcresOfGrading	3,307.50	890.00
tblOffRoadEquipment	HorsePower	187.00	174.00
tblOffRoadEquipment	HorsePower	367.00	313.00
tblOffRoadEquipment	HorsePower	97.00	108.00
tblOffRoadEquipment	HorsePower	97.00	165.00
tblOffRoadEquipment	HorsePower	402.00	479.00
tblOffRoadEquipment	HorsePower	402.00	200.00
tblOffRoadEquipment	HorsePower	65.00	88.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	WorkerTripLength	16.80	60.00

AVEK - Recharge Facility - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0787	0.7703	0.6601	1.4100e-003	0.4951	0.0325	0.5276	0.0571	0.0299	0.0870	0.0000	124.8436	124.8436	0.0345	5.9000e-004	125.8803
2022	0.7850	7.2497	6.9736	0.0159	0.7334	0.3053	1.0387	0.1204	0.2809	0.4013	0.0000	1,406.6146	1,406.6146	0.3893	6.0300e-003	1,418.1437
2023	0.7399	6.5895	6.7438	0.0158	0.7334	0.2754	1.0088	0.1204	0.2534	0.3738	0.0000	1,401.3054	1,401.3054	0.3889	5.4900e-003	1,412.6637
2024	0.2376	2.0403	2.1940	5.2700e-003	0.5594	0.0852	0.6446	0.0742	0.0783	0.1525	0.0000	467.4841	467.4841	0.1299	1.6800e-003	471.2333
Maximum	**0.7850**	**7.2497**	**6.9736**	**0.0159**	**0.7334**	**0.3053**	**1.0387**	**0.1204**	**0.2809**	**0.4013**	**0.0000**	**1,406.6146**	**1,406.6146**	**0.3893**	**6.0300e-003**	**1,418.1437**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0258	0.3712	0.7911	1.4100e-003	0.4951	2.1100e-003	0.4972	0.0571	2.1000e-003	0.0592	0.0000	124.8435	124.8435	0.0345	5.9000e-004	125.8802
2022	0.2855	4.1848	8.8420	0.0159	0.7334	0.0238	0.7572	0.1204	0.0236	0.1440	0.0000	1,406.6132	1,406.6132	0.3893	6.0300e-003	1,418.1422
2023	0.2803	4.1752	8.7554	0.0158	0.7334	0.0237	0.7571	0.1204	0.0235	0.1439	0.0000	1,401.3039	1,401.3039	0.3889	5.4900e-003	1,412.6623

AVEK - Recharge Facility - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2024	0.0922	1.3944	2.8987	5.2700e-003	0.5594	7.8900e-003	0.5673	0.0742	7.8500e-003	0.0820	0.0000	467.4836	467.4836	0.1299	1.6800e-003	471.2328
Maximum	**0.2855**	**4.1848**	**8.8420**	**0.0159**	**0.7334**	**0.0238**	**0.7572**	**0.1204**	**0.0236**	**0.1440**	**0.0000**	**1,406.6132**	**1,406.6132**	**0.3893**	**6.0300e-003**	**1,418.1422**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**62.86**	**39.19**	**-28.46**	**0.00**	**0.00**	**91.78**	**19.91**	**0.00**	**91.11**	**57.70**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	12-1-2021	2-28-2022	2.1200	1.1070
2	3-1-2022	5-31-2022	2.0305	1.1296
3	6-1-2022	8-31-2022	2.0302	1.1293
4	9-1-2022	11-30-2022	2.0087	1.1176
5	12-1-2022	2-28-2023	1.8727	1.1033
6	3-1-2023	5-31-2023	1.8523	1.1260
7	6-1-2023	8-31-2023	1.8520	1.1257
8	9-1-2023	11-30-2023	1.8325	1.1140
9	12-1-2023	2-29-2024	1.7468	1.1122
10	3-1-2024	5-31-2024	1.1409	0.7446
		Highest	2.1200	1.1296

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	12/1/2021	4/30/2024	5	630	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 890

AVEK - Recharge Facility - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Acres of Paving: 890

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Graders	2	6.00	174	0.41
Grading	Off-Highway Trucks	2	4.00	479	0.38
Grading	Off-Highway Trucks	2	4.00	200	0.38
Grading	Scrapers	6	6.00	313	0.48
Grading	Skid Steer Loaders	2	3.00	88	0.37
Grading	Tractors/Loaders/Backhoes	2	5.00	108	0.37
Grading	Tractors/Loaders/Backhoes	2	6.00	165	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	18	45.00	0.00	0.00	60.00	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

AVEK - Recharge Facility - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Fugitive Dust					0.4719	0.0000	0.4719	0.0510	0.0000	0.0510	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0721	0.7624	0.5664	1.2000e-003		0.0324	0.0324		0.0298	0.0298	0.0000	105.0319	105.0319	0.0340	0.0000	105.8811
Total	**0.0721**	**0.7624**	**0.5664**	**1.2000e-003**	**0.4719**	**0.0324**	**0.5043**	**0.0510**	**0.0298**	**0.0807**	**0.0000**	**105.0319**	**105.0319**	**0.0340**	**0.0000**	**105.8811**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.5300e-003	7.9000e-003	0.0937	2.2000e-004	0.0231	1.5000e-004	0.0233	6.1400e-003	1.4000e-004	6.2800e-003	0.0000	19.8118	19.8118	5.0000e-004	5.9000e-004	19.9992
Total	**6.5300e-003**	**7.9000e-003**	**0.0937**	**2.2000e-004**	**0.0231**	**1.5000e-004**	**0.0233**	**6.1400e-003**	**1.4000e-004**	**6.2800e-003**	**0.0000**	**19.8118**	**19.8118**	**5.0000e-004**	**5.9000e-004**	**19.9992**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4719	0.0000	0.4719	0.0510	0.0000	0.0510	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVEK - Recharge Facility - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Off-Road	0.0192	0.3633	0.6974	1.2000e-003		1.9600e-003	1.9600e-003		1.9600e-003	1.9600e-003	0.0000	105.0317	105.0317	0.0340	0.0000	105.8810
Total	**0.0192**	**0.3633**	**0.6974**	**1.2000e-003**	**0.4719**	**1.9600e-003**	**0.4739**	**0.0510**	**1.9600e-003**	**0.0529**	**0.0000**	**105.0317**	**105.0317**	**0.0340**	**0.0000**	**105.8810**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.5300e-003	7.9000e-003	0.0937	2.2000e-004	0.0231	1.5000e-004	0.0233	6.1400e-003	1.4000e-004	6.2800e-003	0.0000	19.8118	19.8118	5.0000e-004	5.9000e-004	19.9992
Total	**6.5300e-003**	**7.9000e-003**	**0.0937**	**2.2000e-004**	**0.0231**	**1.5000e-004**	**0.0233**	**6.1400e-003**	**1.4000e-004**	**6.2800e-003**	**0.0000**	**19.8118**	**19.8118**	**5.0000e-004**	**5.9000e-004**	**19.9992**

3.2 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4719	0.0000	0.4719	0.0510	0.0000	0.0510	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.7170	7.1716	6.0157	0.0135		0.3037	0.3037		0.2794	0.2794	0.0000	1,188.5074	1,188.5074	0.3844	0.0000	1,198.1171

AVEK - Recharge Facility - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Total	**0.7170**	**7.1716**	**6.0157**	**0.0135**	**0.4719**	**0.3037**	**0.7757**	**0.0510**	**0.2794**	**0.3304**	**0.0000**	**1,188.5074**	**1,188.5074**	**0.3844**	**0.0000**	**1,198.1171**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0681	0.0782	0.9580	2.3600e-003	0.2615	1.6100e-003	0.2631	0.0694	1.4800e-003	0.0709	0.0000	218.1072	218.1072	4.9500e-003	6.0300e-003	220.0266
Total	**0.0681**	**0.0782**	**0.9580**	**2.3600e-003**	**0.2615**	**1.6100e-003**	**0.2631**	**0.0694**	**1.4800e-003**	**0.0709**	**0.0000**	**218.1072**	**218.1072**	**4.9500e-003**	**6.0300e-003**	**220.0266**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4719	0.0000	0.4719	0.0510	0.0000	0.0510	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2174	4.1066	7.8840	0.0135		0.0221	0.0221		0.0221	0.0221	0.0000	1,188.5060	1,188.5060	0.3844	0.0000	1,198.1157
Total	**0.2174**	**4.1066**	**7.8840**	**0.0135**	**0.4719**	**0.0221**	**0.4941**	**0.0510**	**0.0221**	**0.0731**	**0.0000**	**1,188.5060**	**1,188.5060**	**0.3844**	**0.0000**	**1,198.1157**

AVEK - Recharge Facility - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0681	0.0782	0.9580	2.3600e-003	0.2615	1.6100e-003	0.2631	0.0694	1.4800e-003	0.0709	0.0000	218.1072	218.1072	4.9500e-003	6.0300e-003	220.0266
Total	**0.0681**	**0.0782**	**0.9580**	**2.3600e-003**	**0.2615**	**1.6100e-003**	**0.2631**	**0.0694**	**1.4800e-003**	**0.0709**	**0.0000**	**218.1072**	**218.1072**	**4.9500e-003**	**6.0300e-003**	**220.0266**

3.2 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4719	0.0000	0.4719	0.0510	0.0000	0.0510	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.6769	6.5209	5.8724	0.0135		0.2739	0.2739		0.2520	0.2520	0.0000	1,188.7711	1,188.7711	0.3845	0.0000	1,198.3829
Total	**0.6769**	**6.5209**	**5.8724**	**0.0135**	**0.4719**	**0.2739**	**0.7458**	**0.0510**	**0.2520**	**0.3029**	**0.0000**	**1,188.7711**	**1,188.7711**	**0.3845**	**0.0000**	**1,198.3829**

AVEK - Recharge Facility - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0629	0.0686	0.8714	2.2900e-003	0.2615	1.5200e-003	0.2630	0.0694	1.4000e-003	0.0708	0.0000	212.5343	212.5343	4.3800e-003	5.4900e-003	214.2808
Total	**0.0629**	**0.0686**	**0.8714**	**2.2900e-003**	**0.2615**	**1.5200e-003**	**0.2630**	**0.0694**	**1.4000e-003**	**0.0708**	**0.0000**	**212.5343**	**212.5343**	**4.3800e-003**	**5.4900e-003**	**214.2808**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4719	0.0000	0.4719	0.0510	0.0000	0.0510	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2174	4.1066	7.8840	0.0135		0.0221	0.0221		0.0221	0.0221	0.0000	1,188.7697	1,188.7697	0.3845	0.0000	1,198.3815
Total	**0.2174**	**4.1066**	**7.8840**	**0.0135**	**0.4719**	**0.0221**	**0.4941**	**0.0510**	**0.0221**	**0.0731**	**0.0000**	**1,188.7697**	**1,188.7697**	**0.3845**	**0.0000**	**1,198.3815**

AVEK - Recharge Facility - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0629	0.0686	0.8714	2.2900e-003	0.2615	1.5200e-003	0.2630	0.0694	1.4000e-003	0.0708	0.0000	212.5343	212.5343	4.3800e-003	5.4900e-003	214.2808
Total	**0.0629**	**0.0686**	**0.8714**	**2.2900e-003**	**0.2615**	**1.5200e-003**	**0.2630**	**0.0694**	**1.4000e-003**	**0.0708**	**0.0000**	**212.5343**	**212.5343**	**4.3800e-003**	**5.4900e-003**	**214.2808**

3.2 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4719	0.0000	0.4719	0.0510	0.0000	0.0510	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2181	2.0201	1.9334	4.5300e-003		0.0847	0.0847		0.0779	0.0779	0.0000	397.6823	397.6823	0.1286	0.0000	400.8978
Total	**0.2181**	**2.0201**	**1.9334**	**4.5300e-003**	**0.4719**	**0.0847**	**0.5566**	**0.0510**	**0.0779**	**0.1289**	**0.0000**	**397.6823**	**397.6823**	**0.1286**	**0.0000**	**400.8978**

Unmitigated Construction Off-Site

AVEK - Recharge Facility - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0195	0.0202	0.2606	7.5000e-004	0.0875	4.8000e-004	0.0880	0.0232	4.4000e-004	0.0237	0.0000	69.8018	69.8018	1.2900e-003	1.6800e-003	70.3355
Total	**0.0195**	**0.0202**	**0.2606**	**7.5000e-004**	**0.0875**	**4.8000e-004**	**0.0880**	**0.0232**	**4.4000e-004**	**0.0237**	**0.0000**	**69.8018**	**69.8018**	**1.2900e-003**	**1.6800e-003**	**70.3355**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4719	0.0000	0.4719	0.0510	0.0000	0.0510	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0728	1.3741	2.6381	4.5300e-003		7.4100e-003	7.4100e-003		7.4100e-003	7.4100e-003	0.0000	397.6819	397.6819	0.1286	0.0000	400.8973
Total	**0.0728**	**1.3741**	**2.6381**	**4.5300e-003**	**0.4719**	**7.4100e-003**	**0.4793**	**0.0510**	**7.4100e-003**	**0.0584**	**0.0000**	**397.6819**	**397.6819**	**0.1286**	**0.0000**	**400.8973**

Mitigated Construction Off-Site

AVEK - Recharge Facility - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0195	0.0202	0.2606	7.5000e-004	0.0875	4.8000e-004	0.0880	0.0232	4.4000e-004	0.0237	0.0000	69.8018	69.8018	1.2900e-003	1.6800e-003	70.3355
Total	**0.0195**	**0.0202**	**0.2606**	**7.5000e-004**	**0.0875**	**4.8000e-004**	**0.0880**	**0.0232**	**4.4000e-004**	**0.0237**	**0.0000**	**69.8018**	**69.8018**	**1.2900e-003**	**1.6800e-003**	**70.3355**

Appendix D

CalEEMod Outputs – Activity 5

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

AVEK - Recovery Facilities

Antelope Valley APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	6.50	Acre	6.50	283,140.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Proposed Extraction Wells/Recovery [Recovery Facilities, Table 2.4-4]

Land Use - Per AVEK Project Description, 6.5 acres for this phase

Construction Phase - Per project schedule, estimated construction is from December 2021 through April 2024.

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 grader (174 hp, 6 hours per day)
2 wheeled loaders (313 hp; 1 hour per day)
1 water truck (200 hp, 1 hour per day)

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 hydraulic excavators (180 hp, 6 hours per day)

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 drilling rigs (500 HP, 24 hrs per day for 90 days)
2 off-highway trucks (479 hp, 4 hours per day)
2 Test pumps (200 hp, 60 hrs per well)
2 skip loader (88 hp, 1 hour per day)
2 small roller compactor (114 hp, 1 hour per day)

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Construction Off-road Equipment Mitigation - Per AVEK AECOM 2017 technical memorandum, AQ-1 mitigation measure applied.

Grading - Excess spoil from excavation operations will incorporated into the recharge basin berms and thus will not be hauled off site.

Trips and VMT - Per the project description, 60 worker trips and 12 vendor trips per day at 60 miles in length.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	230.00	630.00
tblConstructionPhase	NumDays	20.00	630.00
tblConstructionPhase	PhaseEndDate	11/15/2022	4/30/2024
tblConstructionPhase	PhaseEndDate	12/28/2021	4/30/2024
tblConstructionPhase	PhaseEndDate	12/28/2021	4/30/2024
tblConstructionPhase	PhaseStartDate	12/29/2021	12/1/2021
tblConstructionPhase	PhaseStartDate	12/29/2021	12/1/2021
tblGrading	AcresOfGrading	472.50	6.50
tblOffRoadEquipment	HorsePower	402.00	479.00

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblOffRoadEquipment	HorsePower	97.00	313.00
tblOffRoadEquipment	HorsePower	158.00	180.00
tblOffRoadEquipment	HorsePower	221.00	500.00
tblOffRoadEquipment	HorsePower	402.00	479.00
tblOffRoadEquipment	HorsePower	84.00	200.00
tblOffRoadEquipment	HorsePower	65.00	88.00
tblOffRoadEquipment	HorsePower	80.00	114.00
tblOffRoadEquipment	HorsePower	187.00	174.00
tblOffRoadEquipment	LoadFactor	0.37	0.41
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripNumber	46.00	12.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripNumber	13.00	20.00
tblTripsAndVMT	WorkerTripNumber	5.00	10.00
tblTripsAndVMT	WorkerTripNumber	119.00	30.00

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	9.7125	88.5488	74.3236	0.3143	3.4124	3.0332	6.4456	0.9179	2.8586	3.7765	0.0000	30,501.6912	30,501.6912	5.8140	0.3499	30,751.3124
2022	8.8407	74.7137	71.7287	0.3122	3.4124	2.5434	5.9557	0.9179	2.3979	3.3157	0.0000	30,301.7882	30,301.7882	5.7643	0.3338	30,545.3692
2023	8.2472	64.9896	69.8168	0.3098	3.4124	2.1960	5.6084	0.9179	2.0711	2.9890	0.0000	30,076.1590	30,076.1590	5.7121	0.3162	30,313.1772
2024	8.0211	59.9680	68.6020	0.3089	3.4124	2.0148	5.4271	0.9179	1.8969	2.8148	0.0000	30,000.6271	30,000.6271	5.7096	0.3049	30,234.2148
Maximum	**9.7125**	**88.5488**	**74.3236**	**0.3143**	**3.4124**	**3.0332**	**6.4456**	**0.9179**	**2.8586**	**3.7765**	**0.0000**	**30,501.6912**	**30,501.6912**	**5.8140**	**0.3499**	**30,751.3124**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	5.1007	73.4331	150.6958	0.3143	3.4124	0.5097	3.9221	0.9179	0.5048	1.4227	0.0000	30,501.6912	30,501.6912	5.8140	0.3499	30,751.3124
2022	4.9597	72.4749	149.1576	0.3122	3.4124	0.4714	3.8838	0.9179	0.4682	1.3861	0.0000	30,301.7881	30,301.7881	5.7643	0.3338	30,545.3692
2023	4.8408	71.6330	147.8737	0.3098	3.4124	0.4451	3.8575	0.9179	0.4431	1.3610	0.0000	30,076.1590	30,076.1590	5.7121	0.3162	30,313.1772

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2024	4.7851	71.4855	146.6658	0.3089	3.4124	0.4457	3.8581	0.9179	0.4437	1.3616	0.0000	30,000.6271	30,000.6271	5.7096	0.3049	30,234.2147
Maximum	**5.1007**	**73.4331**	**150.6958**	**0.3143**	**3.4124**	**0.5097**	**3.9221**	**0.9179**	**0.5048**	**1.4227**	**0.0000**	**30,501.6912**	**30,501.6912**	**5.8140**	**0.3499**	**30,751.3124**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**43.46**	**-0.28**	**-108.95**	**0.00**	**0.00**	**80.87**	**33.77**	**0.00**	**79.84**	**57.11**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	12/1/2021	4/30/2024	5	630	
2	Trenching	Trenching	12/1/2021	4/30/2024	5	630	
3	Well Construction	Building Construction	12/1/2021	4/30/2024	5	630	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 6.5

Acres of Paving: 6.5

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Off-Highway Trucks	1	4.00	479	0.38
Grading	Tractors/Loaders/Backhoes	2	1.00	313	0.41
Trenching	Excavators	2	6.00	180	0.38
Well Construction	Bore/Drill Rigs	2	24.00	500	0.50

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Well Construction	Off-Highway Trucks	2	4.00	479	0.38
Well Construction	Pumps	2	24.00	200	0.74
Well Construction	Skid Steer Loaders	2	1.00	88	0.37
Well Construction	Rollers	2	1.00	114	0.38
Grading	Graders	2	6.00	174	0.41

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	5	20.00	0.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	10.00	0.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT
Well Construction	10	30.00	12.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	1.4162	13.2744	9.6234	0.0199		0.6608	0.6608		0.6079	0.6079		1,930.4000	1,930.4000	0.6243		1,946.0083
Total	**1.4162**	**13.2744**	**9.6234**	**0.0199**	**0.0109**	**0.6608**	**0.6717**	**1.1800e-003**	**0.6079**	**0.6091**		**1,930.4000**	**1,930.4000**	**0.6243**		**1,946.0083**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2756	0.2725	4.4357	9.1100e-003	0.9119	5.8700e-003	0.9177	0.2418	5.4000e-003	0.2472		922.6270	922.6270	0.0232	0.0232	930.1151
Total	**0.2756**	**0.2725**	**4.4357**	**9.1100e-003**	**0.9119**	**5.8700e-003**	**0.9177**	**0.2418**	**5.4000e-003**	**0.2472**		**922.6270**	**922.6270**	**0.0232**	**0.0232**	**930.1151**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	0.2869	6.8583	12.6277	0.0199		0.0325	0.0325		0.0325	0.0325	0.0000	1,930.4000	1,930.4000	0.6243		1,946.0083
Total	**0.2869**	**6.8583**	**12.6277**	**0.0199**	**0.0109**	**0.0325**	**0.0434**	**1.1800e-003**	**0.0325**	**0.0337**	**0.0000**	**1,930.4000**	**1,930.4000**	**0.6243**		**1,946.0083**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2756	0.2725	4.4357	9.1100e-003	0.9119	5.8700e-003	0.9177	0.2418	5.4000e-003	0.2472		922.6270	922.6270	0.0232	0.0232	930.1151
Total	**0.2756**	**0.2725**	**4.4357**	**9.1100e-003**	**0.9119**	**5.8700e-003**	**0.9177**	**0.2418**	**5.4000e-003**	**0.2472**		**922.6270**	**922.6270**	**0.0232**	**0.0232**	**930.1151**

3.2 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	1.2366	10.9894	9.3176	0.0199		0.5497	0.5497		0.5057	0.5057		1,930.7201	1,930.7201	0.6244		1,946.3309
Total	**1.2366**	**10.9894**	**9.3176**	**0.0199**	**0.0109**	**0.5497**	**0.5606**	**1.1800e-003**	**0.5057**	**0.5069**		**1,930.7201**	**1,930.7201**	**0.6244**		**1,946.3309**

Unmitigated Construction Off-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2535	0.2384	4.0121	8.8300e-003	0.9119	5.5100e-003	0.9174	0.2418	5.0800e-003	0.2468		898.2301	898.2301	0.0205	0.0210	905.0119
Total	**0.2535**	**0.2384**	**4.0121**	**8.8300e-003**	**0.9119**	**5.5100e-003**	**0.9174**	**0.2418**	**5.0800e-003**	**0.2468**		**898.2301**	**898.2301**	**0.0205**	**0.0210**	**905.0119**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	0.2869	6.8583	12.6277	0.0199		0.0325	0.0325		0.0325	0.0325	0.0000	1,930.7201	1,930.7201	0.6244		1,946.3309
Total	**0.2869**	**6.8583**	**12.6277**	**0.0199**	**0.0109**	**0.0325**	**0.0434**	**1.1800e-003**	**0.0325**	**0.0337**	**0.0000**	**1,930.7201**	**1,930.7201**	**0.6244**		**1,946.3309**

Mitigated Construction Off-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2535	0.2384	4.0121	8.8300e-003	0.9119	5.5100e-003	0.9174	0.2418	5.0800e-003	0.2468		898.2301	898.2301	0.0205	0.0210	905.0119
Total	**0.2535**	**0.2384**	**4.0121**	**8.8300e-003**	**0.9119**	**5.5100e-003**	**0.9174**	**0.2418**	**5.0800e-003**	**0.2468**		**898.2301**	**898.2301**	**0.0205**	**0.0210**	**905.0119**

3.2 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	1.1219	9.5273	9.1944	0.0199		0.4722	0.4722		0.4345	0.4345		1,931.1811	1,931.1811	0.6246		1,946.7957
Total	**1.1219**	**9.5273**	**9.1944**	**0.0199**	**0.0109**	**0.4722**	**0.4832**	**1.1800e-003**	**0.4345**	**0.4356**		**1,931.1811**	**1,931.1811**	**0.6246**		**1,946.7957**

Unmitigated Construction Off-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2338	0.2093	3.6496	8.5500e-003	0.9119	5.2000e-003	0.9171	0.2418	4.7900e-003	0.2465		875.0209	875.0209	0.0181	0.0192	881.1920
Total	**0.2338**	**0.2093**	**3.6496**	**8.5500e-003**	**0.9119**	**5.2000e-003**	**0.9171**	**0.2418**	**4.7900e-003**	**0.2465**		**875.0209**	**875.0209**	**0.0181**	**0.0192**	**881.1920**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	0.2869	6.8583	12.6277	0.0199		0.0325	0.0325		0.0325	0.0325	0.0000	1,931.1811	1,931.1811	0.6246		1,946.7957
Total	**0.2869**	**6.8583**	**12.6277**	**0.0199**	**0.0109**	**0.0325**	**0.0434**	**1.1800e-003**	**0.0325**	**0.0337**	**0.0000**	**1,931.1811**	**1,931.1811**	**0.6246**		**1,946.7957**

Mitigated Construction Off-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2338	0.2093	3.6496	8.5500e-003	0.9119	5.2000e-003	0.9171	0.2418	4.7900e-003	0.2465		875.0209	875.0209	0.0181	0.0192	881.1920
Total	**0.2338**	**0.2093**	**3.6496**	**8.5500e-003**	**0.9119**	**5.2000e-003**	**0.9171**	**0.2418**	**4.7900e-003**	**0.2465**		**875.0209**	**875.0209**	**0.0181**	**0.0192**	**881.1920**

3.2 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	1.0679	8.6844	9.1370	0.0200		0.4301	0.4301		0.3957	0.3957		1,931.8700	1,931.8700	0.6248		1,947.4902
Total	**1.0679**	**8.6844**	**9.1370**	**0.0200**	**0.0109**	**0.4301**	**0.4411**	**1.1800e-003**	**0.3957**	**0.3969**		**1,931.8700**	**1,931.8700**	**0.6248**		**1,947.4902**

Unmitigated Construction Off-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2159	0.1844	3.2587	8.3200e-003	0.9119	4.9000e-003	0.9168	0.2418	4.5100e-003	0.2463		858.5570	858.5570	0.0159	0.0176	864.1912
Total	**0.2159**	**0.1844**	**3.2587**	**8.3200e-003**	**0.9119**	**4.9000e-003**	**0.9168**	**0.2418**	**4.5100e-003**	**0.2463**		**858.5570**	**858.5570**	**0.0159**	**0.0176**	**864.1912**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	0.2869	6.8583	12.6277	0.0200		0.0325	0.0325		0.0325	0.0325	0.0000	1,931.8700	1,931.8700	0.6248		1,947.4902
Total	**0.2869**	**6.8583**	**12.6277**	**0.0200**	**0.0109**	**0.0325**	**0.0434**	**1.1800e-003**	**0.0325**	**0.0337**	**0.0000**	**1,931.8700**	**1,931.8700**	**0.6248**		**1,947.4902**

Mitigated Construction Off-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2159	0.1844	3.2587	8.3200e-003	0.9119	4.9000e-003	0.9168	0.2418	4.5100e-003	0.2463		858.5570	858.5570	0.0159	0.0176	864.1912
Total	**0.2159**	**0.1844**	**3.2587**	**8.3200e-003**	**0.9119**	**4.9000e-003**	**0.9168**	**0.2418**	**4.5100e-003**	**0.2463**		**858.5570**	**858.5570**	**0.0159**	**0.0176**	**864.1912**

3.3 Trenching - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2946	3.0866	1.9964	8.8200e-003		0.0946	0.0946		0.0870	0.0870		853.7352	853.7352	0.2761		860.6381
Total	**0.2946**	**3.0866**	**1.9964**	**8.8200e-003**		**0.0946**	**0.0946**		**0.0870**	**0.0870**		**853.7352**	**853.7352**	**0.2761**		**860.6381**

Unmitigated Construction Off-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1378	0.1362	2.2179	4.5500e-003	0.4559	2.9300e-003	0.4589	0.1209	2.7000e-003	0.1236		461.3135	461.3135	0.0116	0.0116	465.0576
Total	**0.1378**	**0.1362**	**2.2179**	**4.5500e-003**	**0.4559**	**2.9300e-003**	**0.4589**	**0.1209**	**2.7000e-003**	**0.1236**		**461.3135**	**461.3135**	**0.0116**	**0.0116**	**465.0576**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1448	2.3343	4.7048	8.8200e-003		0.0145	0.0145		0.0145	0.0145	0.0000	853.7352	853.7352	0.2761		860.6381
Total	**0.1448**	**2.3343**	**4.7048**	**8.8200e-003**		**0.0145**	**0.0145**		**0.0145**	**0.0145**	**0.0000**	**853.7352**	**853.7352**	**0.2761**		**860.6381**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1378	0.1362	2.2179	4.5500e-003	0.4559	2.9300e-003	0.4589	0.1209	2.7000e-003	0.1236		461.3135	461.3135	0.0116	0.0116	465.0576
Total	**0.1378**	**0.1362**	**2.2179**	**4.5500e-003**	**0.4559**	**2.9300e-003**	**0.4589**	**0.1209**	**2.7000e-003**	**0.1236**		**461.3135**	**461.3135**	**0.0116**	**0.0116**	**465.0576**

3.3 Trenching - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2685	2.5083	1.9753	8.8300e-003		0.0788	0.0788		0.0725	0.0725		854.1842	854.1842	0.2763		861.0907
Total	**0.2685**	**2.5083**	**1.9753**	**8.8300e-003**		**0.0788**	**0.0788**		**0.0725**	**0.0725**		**854.1842**	**854.1842**	**0.2763**		**861.0907**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Worker	0.1268	0.1192	2.0061	4.4100e-003	0.4559	2.7600e-003	0.4587	0.1209	2.5400e-003	0.1234		449.1150	449.1150	0.0102	0.0105	452.5059
Total	**0.1268**	**0.1192**	**2.0061**	**4.4100e-003**	**0.4559**	**2.7600e-003**	**0.4587**	**0.1209**	**2.5400e-003**	**0.1234**		**449.1150**	**449.1150**	**0.0102**	**0.0105**	**452.5059**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1448	2.3343	4.7048	8.8300e-003		0.0145	0.0145		0.0145	0.0145	0.0000	854.1842	854.1842	0.2763		861.0907
Total	**0.1448**	**2.3343**	**4.7048**	**8.8300e-003**		**0.0145**	**0.0145**		**0.0145**	**0.0145**	**0.0000**	**854.1842**	**854.1842**	**0.2763**		**861.0907**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1268	0.1192	2.0061	4.4100e-003	0.4559	2.7600e-003	0.4587	0.1209	2.5400e-003	0.1234		449.1150	449.1150	0.0102	0.0105	452.5059
Total	**0.1268**	**0.1192**	**2.0061**	**4.4100e-003**	**0.4559**	**2.7600e-003**	**0.4587**	**0.1209**	**2.5400e-003**	**0.1234**		**449.1150**	**449.1150**	**0.0102**	**0.0105**	**452.5059**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Trenching - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2569	2.1885	1.9718	8.8300e-003		0.0701	0.0701		0.0645	0.0645		854.4952	854.4952	0.2764		861.4042
Total	**0.2569**	**2.1885**	**1.9718**	**8.8300e-003**		**0.0701**	**0.0701**		**0.0645**	**0.0645**		**854.4952**	**854.4952**	**0.2764**		**861.4042**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1169	0.1046	1.8248	4.2800e-003	0.4559	2.6000e-003	0.4585	0.1209	2.3900e-003	0.1233		437.5104	437.5104	9.0400e-003	9.6000e-003	440.5960
Total	**0.1169**	**0.1046**	**1.8248**	**4.2800e-003**	**0.4559**	**2.6000e-003**	**0.4585**	**0.1209**	**2.3900e-003**	**0.1233**		**437.5104**	**437.5104**	**9.0400e-003**	**9.6000e-003**	**440.5960**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1448	2.3343	4.7048	8.8300e-003		0.0145	0.0145		0.0145	0.0145	0.0000	854.4952	854.4952	0.2764		861.4042
Total	**0.1448**	**2.3343**	**4.7048**	**8.8300e-003**		**0.0145**	**0.0145**		**0.0145**	**0.0145**	**0.0000**	**854.4952**	**854.4952**	**0.2764**		**861.4042**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1169	0.1046	1.8248	4.2800e-003	0.4559	2.6000e-003	0.4585	0.1209	2.3900e-003	0.1233		437.5104	437.5104	9.0400e-003	9.6000e-003	440.5960
Total	**0.1169**	**0.1046**	**1.8248**	**4.2800e-003**	**0.4559**	**2.6000e-003**	**0.4585**	**0.1209**	**2.3900e-003**	**0.1233**		**437.5104**	**437.5104**	**9.0400e-003**	**9.6000e-003**	**440.5960**

3.3 Trenching - 2024

Unmitigated Construction On-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2513	2.0051	1.9722	8.8300e-003		0.0647	0.0647		0.0596	0.0596		854.9085	854.9085	0.2765		861.8209
Total	**0.2513**	**2.0051**	**1.9722**	**8.8300e-003**		**0.0647**	**0.0647**		**0.0596**	**0.0596**		**854.9085**	**854.9085**	**0.2765**		**861.8209**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1080	0.0922	1.6294	4.1600e-003	0.4559	2.4500e-003	0.4584	0.1209	2.2600e-003	0.1231		429.2785	429.2785	7.9600e-003	8.7900e-003	432.0956
Total	**0.1080**	**0.0922**	**1.6294**	**4.1600e-003**	**0.4559**	**2.4500e-003**	**0.4584**	**0.1209**	**2.2600e-003**	**0.1231**		**429.2785**	**429.2785**	**7.9600e-003**	**8.7900e-003**	**432.0956**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Off-Road	0.1448	2.3343	4.7048	8.8300e-003		0.0145	0.0145		0.0145	0.0145	0.0000	854.9085	854.9085	0.2765		861.8209
Total	**0.1448**	**2.3343**	**4.7048**	**8.8300e-003**		**0.0145**	**0.0145**		**0.0145**	**0.0145**	**0.0000**	**854.9085**	**854.9085**	**0.2765**		**861.8209**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1080	0.0922	1.6294	4.1600e-003	0.4559	2.4500e-003	0.4584	0.1209	2.2600e-003	0.1231		429.2785	429.2785	7.9600e-003	8.7900e-003	432.0956
Total	**0.1080**	**0.0922**	**1.6294**	**4.1600e-003**	**0.4559**	**2.4500e-003**	**0.4584**	**0.1209**	**2.2600e-003**	**0.1231**		**429.2785**	**429.2785**	**7.9600e-003**	**8.7900e-003**	**432.0956**

3.4 Well Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	6.9953	67.1294	48.4187	0.2398		2.1804	2.1804		2.0711	2.0711		23,009.9666	23,009.9666	4.8295		23,130.7050
Total	**6.9953**	**67.1294**	**48.4187**	**0.2398**		**2.1804**	**2.1804**		**2.0711**	**2.0711**		**23,009.9666**	**23,009.9666**	**4.8295**		**23,130.7050**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1796	4.2410	0.9780	0.0184	0.6659	0.0799	0.7457	0.1915	0.0764	0.2679		1,939.7084	1,939.7084	0.0144	0.2804	2,023.6156
Worker	0.4134	0.4087	6.6536	0.0137	1.3678	8.8000e-003	1.3766	0.3626	8.1000e-003	0.3707		1,383.9405	1,383.9405	0.0348	0.0348	1,395.1727
Total	**0.5930**	**4.6498**	**7.6316**	**0.0321**	**2.0337**	**0.0887**	**2.1223**	**0.5541**	**0.0845**	**0.6386**		**3,323.6489**	**3,323.6489**	**0.0492**	**0.3151**	**3,418.7883**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6627	59.1819	119.0781	0.2398		0.3653	0.3653		0.3653	0.3653	0.0000	23,009.9666	23,009.9666	4.8295		23,130.7050
Total	**3.6627**	**59.1819**	**119.0781**	**0.2398**		**0.3653**	**0.3653**		**0.3653**	**0.3653**	**0.0000**	**23,009.9666**	**23,009.9666**	**4.8295**		**23,130.7050**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1796	4.2410	0.9780	0.0184	0.6659	0.0799	0.7457	0.1915	0.0764	0.2679		1,939.7084	1,939.7084	0.0144	0.2804	2,023.6156
Worker	0.4134	0.4087	6.6536	0.0137	1.3678	8.8000e-003	1.3766	0.3626	8.1000e-003	0.3707		1,383.9405	1,383.9405	0.0348	0.0348	1,395.1727
Total	**0.5930**	**4.6498**	**7.6316**	**0.0321**	**2.0337**	**0.0887**	**2.1223**	**0.5541**	**0.0845**	**0.6386**		**3,323.6489**	**3,323.6489**	**0.0492**	**0.3151**	**3,418.7883**

3.4 Well Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	6.4703	57.1157	47.6888	0.2391		1.8558	1.8558		1.7637	1.7637		22,941.1819	22,941.1819	4.7916		23,060.9726
Total	**6.4703**	**57.1157**	**47.6888**	**0.2391**		**1.8558**	**1.8558**		**1.7637**	**1.7637**		**22,941.1819**	**22,941.1819**	**4.7916**		**23,060.9726**

Unmitigated Construction Off-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1048	3.3852	0.7108	0.0178	0.6659	0.0427	0.7085	0.1915	0.0408	0.2323		1,881.0119	1,881.0119	0.0106	0.2707	1,961.9393
Worker	0.3803	0.3576	6.0181	0.0132	1.3678	8.2700e-003	1.3761	0.3626	7.6100e-003	0.3702		1,347.3451	1,347.3451	0.0307	0.0316	1,357.5178
Total	**0.4850**	**3.7428**	**6.7289**	**0.0311**	**2.0337**	**0.0509**	**2.0846**	**0.5541**	**0.0484**	**0.6025**		**3,228.3569**	**3,228.3569**	**0.0413**	**0.3022**	**3,319.4571**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6627	59.1819	119.0781	0.2391		0.3653	0.3653		0.3653	0.3653	0.0000	22,941.1819	22,941.1819	4.7916		23,060.9726
Total	**3.6627**	**59.1819**	**119.0781**	**0.2391**		**0.3653**	**0.3653**		**0.3653**	**0.3653**	**0.0000**	**22,941.1819**	**22,941.1819**	**4.7916**		**23,060.9726**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1048	3.3852	0.7108	0.0178	0.6659	0.0427	0.7085	0.1915	0.0408	0.2323		1,881.0119	1,881.0119	0.0106	0.2707	1,961.9393
Worker	0.3803	0.3576	6.0181	0.0132	1.3678	8.2700e-003	1.3761	0.3626	7.6100e-003	0.3702		1,347.3451	1,347.3451	0.0307	0.0316	1,357.5178
Total	**0.4850**	**3.7428**	**6.7289**	**0.0311**	**2.0337**	**0.0509**	**2.0846**	**0.5541**	**0.0484**	**0.6025**		**3,228.3569**	**3,228.3569**	**0.0413**	**0.3022**	**3,319.4571**

3.4 Well Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	6.1219	50.0154	47.1875	0.2382		1.6208	1.6208		1.5412	1.5412		22,858.9137	22,858.9137	4.7494		22,977.6477
Total	**6.1219**	**50.0154**	**47.1875**	**0.2382**		**1.6208**	**1.6208**		**1.5412**	**1.5412**		**22,858.9137**	**22,858.9137**	**4.7494**		**22,977.6477**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0450	2.6306	0.5144	0.0171	0.6659	0.0173	0.6832	0.1915	0.0166	0.2080		1,806.5066	1,806.5066	7.5200e-003	0.2586	1,883.7537

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Worker	0.3508	0.3139	5.4743	0.0128	1.3678	7.8000e-003	1.3756	0.3626	7.1800e-003	0.3698		1,312.5313	1,312.5313	0.0271	0.0288	1,321.7880
Total	**0.3957**	**2.9445**	**5.9887**	**0.0300**	**2.0337**	**0.0251**	**2.0588**	**0.5541**	**0.0237**	**0.5778**		**3,119.0378**	**3,119.0378**	**0.0346**	**0.2874**	**3,205.5417**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6627	59.1819	119.0781	0.2382		0.3653	0.3653		0.3653	0.3653	0.0000	22,858.9136	22,858.9136	4.7494		22,977.6477
Total	**3.6627**	**59.1819**	**119.0781**	**0.2382**		**0.3653**	**0.3653**		**0.3653**	**0.3653**	**0.0000**	**22,858.9136**	**22,858.9136**	**4.7494**		**22,977.6477**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0450	2.6306	0.5144	0.0171	0.6659	0.0173	0.6832	0.1915	0.0166	0.2080		1,806.5066	1,806.5066	7.5200e-003	0.2586	1,883.7537
Worker	0.3508	0.3139	5.4743	0.0128	1.3678	7.8000e-003	1.3756	0.3626	7.1800e-003	0.3698		1,312.5313	1,312.5313	0.0271	0.0288	1,321.7880
Total	**0.3957**	**2.9445**	**5.9887**	**0.0300**	**2.0337**	**0.0251**	**2.0588**	**0.5541**	**0.0237**	**0.5778**		**3,119.0378**	**3,119.0378**	**0.0346**	**0.2874**	**3,205.5417**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Well Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	6.0111	46.1675	47.2375	0.2384		1.4864	1.4864		1.4101	1.4101		22,871.1321	22,871.1321	4.7533		22,989.9647
Total	**6.0111**	**46.1675**	**47.2375**	**0.2384**		**1.4864**	**1.4864**		**1.4101**	**1.4101**		**22,871.1321**	**22,871.1321**	**4.7533**		**22,989.9647**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0430	2.5577	0.4790	0.0168	0.6659	0.0188	0.6846	0.1915	0.0180	0.2094		1,767.0455	1,767.0455	7.2000e-003	0.2522	1,842.3655
Worker	0.3239	0.2767	4.8881	0.0125	1.3678	7.3500e-003	1.3751	0.3626	6.7700e-003	0.3694		1,287.8355	1,287.8355	0.0239	0.0264	1,296.2867
Total	**0.3669**	**2.8343**	**5.3671**	**0.0292**	**2.0337**	**0.0261**	**2.0598**	**0.5541**	**0.0247**	**0.5788**		**3,054.8810**	**3,054.8810**	**0.0311**	**0.2785**	**3,138.6523**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6627	59.1819	119.0781	0.2384		0.3653	0.3653		0.3653	0.3653	0.0000	22,871.1320	22,871.1320	4.7533		22,989.9647
Total	**3.6627**	**59.1819**	**119.0781**	**0.2384**		**0.3653**	**0.3653**		**0.3653**	**0.3653**	**0.0000**	**22,871.1320**	**22,871.1320**	**4.7533**		**22,989.9647**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0430	2.5577	0.4790	0.0168	0.6659	0.0188	0.6846	0.1915	0.0180	0.2094		1,767.0455	1,767.0455	7.2000e-003	0.2522	1,842.3655
Worker	0.3239	0.2767	4.8881	0.0125	1.3678	7.3500e-003	1.3751	0.3626	6.7700e-003	0.3694		1,287.8355	1,287.8355	0.0239	0.0264	1,296.2867
Total	**0.3669**	**2.8343**	**5.3671**	**0.0292**	**2.0337**	**0.0261**	**2.0598**	**0.5541**	**0.0247**	**0.5788**		**3,054.8810**	**3,054.8810**	**0.0311**	**0.2785**	**3,138.6523**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

AVEK - Recovery Facilities

Antelope Valley APCD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	6.50	Acre	6.50	283,140.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Proposed Extraction Wells/Recovery [Recovery Facilities, Table 2.4-4]

Land Use - Per AVEK Project Description, 6.5 acres for this phase

Construction Phase - Per project schedule, estimated construction is from December 2021 through April 2024.

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 grader (174 hp, 6 hours per day)
2 wheeled loaders (313 hp; 1 hour per day)
1 water truck (200 hp, 1 hour per day)

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 hydraulic excavators (180 hp, 6 hours per day)

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 drilling rigs (500 HP, 24 hrs per day for 90 days)
2 off-highway trucks (479 hp, 4 hours per day)
2 Test pumps (200 hp, 60 hrs per well)
2 skip loader (88 hp, 1 hour per day)
2 small roller compactor (114 hp, 1 hour per day)

Construction Off-road Equipment Mitigation - Per AVEK AECOM 2017 technical memorandum, AQ-1 mitigation measure applied.

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Grading - Excess spoil from excavation operations will incorporated into the recharge basin berms and thus will not be hauled off site.

Trips and VMT - Per the project description, 60 worker trips and 12 vendor trips per day at 60 miles in length.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	230.00	630.00
tblConstructionPhase	NumDays	20.00	630.00
tblConstructionPhase	PhaseEndDate	11/15/2022	4/30/2024
tblConstructionPhase	PhaseEndDate	12/28/2021	4/30/2024
tblConstructionPhase	PhaseEndDate	12/28/2021	4/30/2024
tblConstructionPhase	PhaseStartDate	12/29/2021	12/1/2021
tblConstructionPhase	PhaseStartDate	12/29/2021	12/1/2021
tblGrading	AcresOfGrading	472.50	6.50
tblOffRoadEquipment	HorsePower	402.00	479.00
tblOffRoadEquipment	HorsePower	97.00	313.00

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblOffRoadEquipment	HorsePower	158.00	180.00
tblOffRoadEquipment	HorsePower	221.00	500.00
tblOffRoadEquipment	HorsePower	402.00	479.00
tblOffRoadEquipment	HorsePower	84.00	200.00
tblOffRoadEquipment	HorsePower	65.00	88.00
tblOffRoadEquipment	HorsePower	80.00	114.00
tblOffRoadEquipment	HorsePower	187.00	174.00
tblOffRoadEquipment	LoadFactor	0.37	0.41
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripNumber	46.00	12.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripNumber	13.00	20.00
tblTripsAndVMT	WorkerTripNumber	5.00	10.00
tblTripsAndVMT	WorkerTripNumber	119.00	30.00

2.0 Emissions Summary

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	9.7067	88.8078	71.1227	0.3112	3.4124	3.0332	6.4456	0.9179	2.8587	3.7765	0.0000	30,195.5994	30,195.5994	5.8059	0.3525	30,445.7813
2022	8.8392	74.9254	68.8344	0.3093	3.4124	2.5434	5.9558	0.9179	2.3979	3.3157	0.0000	30,004.9304	30,004.9304	5.7572	0.3361	30,249.0232
2023	8.2492	65.1610	67.1834	0.3070	3.4124	2.1960	5.6084	0.9179	2.0711	2.9890	0.0000	29,788.1775	29,788.1775	5.7059	0.3183	30,025.6748
2024	8.0266	60.1314	66.2603	0.3062	3.4124	2.0148	5.4271	0.9179	1.8969	2.8148	0.0000	29,719.0905	29,719.0905	5.7043	0.3068	29,953.1249
Maximum	**9.7067**	**88.8078**	**71.1227**	**0.3112**	**3.4124**	**3.0332**	**6.4456**	**0.9179**	**2.8587**	**3.7765**	**0.0000**	**30,195.5994**	**30,195.5994**	**5.8059**	**0.3525**	**30,445.7813**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	5.0949	73.6921	147.4949	0.3112	3.4124	0.5097	3.9221	0.9179	0.5049	1.4228	0.0000	30,195.5993	30,195.5993	5.8059	0.3525	30,445.7813
2022	4.9582	72.6866	146.2634	0.3093	3.4124	0.4714	3.8838	0.9179	0.4683	1.3861	0.0000	30,004.9304	30,004.9304	5.7572	0.3361	30,249.0232
2023	4.8429	71.8044	145.2403	0.3070	3.4124	0.4452	3.8575	0.9179	0.4432	1.3611	0.0000	29,788.1774	29,788.1774	5.7059	0.3183	30,025.6747
2024	4.7907	71.6489	144.3241	0.3062	3.4124	0.4457	3.8581	0.9179	0.4437	1.3616	0.0000	29,719.0905	29,719.0905	5.7043	0.3068	29,953.1249
Maximum	**5.0949**	**73.6921**	**147.4949**	**0.3112**	**3.4124**	**0.5097**	**3.9221**	**0.9179**	**0.5049**	**1.4228**	**0.0000**	**30,195.5993**	**30,195.5993**	**5.8059**	**0.3525**	**30,445.7813**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	43.46	-0.28	-113.36	0.00	0.00	80.87	33.77	0.00	79.84	57.11	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	12/1/2021	4/30/2024	5	630	
2	Trenching	Trenching	12/1/2021	4/30/2024	5	630	
3	Well Construction	Building Construction	12/1/2021	4/30/2024	5	630	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 6.5

Acres of Paving: 6.5

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Off-Highway Trucks	1	4.00	479	0.38
Grading	Tractors/Loaders/Backhoes	2	1.00	313	0.41
Trenching	Excavators	2	6.00	180	0.38
Well Construction	Bore/Drill Rigs	2	24.00	500	0.50
Well Construction	Off-Highway Trucks	2	4.00	479	0.38
Well Construction	Pumps	2	24.00	200	0.74
Well Construction	Skid Steer Loaders	2	1.00	88	0.37
Well Construction	Rollers	2	1.00	114	0.38

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Grading	Graders	2	6.00	174	0.41

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	5	20.00	0.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	10.00	0.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT
Well Construction	10	30.00	12.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	1.4162	13.2744	9.6234	0.0199		0.6608	0.6608		0.6079	0.6079		1,930.4000	1,930.4000	0.6243		1,946.0083
Total	**1.4162**	**13.2744**	**9.6234**	**0.0199**	**0.0109**	**0.6608**	**0.6717**	**1.1800e-003**	**0.6079**	**0.6091**		**1,930.4000**	**1,930.4000**	**0.6243**		**1,946.0083**

Unmitigated Construction Off-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2738	0.2873	3.3687	8.1000e-003	0.9119	5.8700e-003	0.9177	0.2418	5.4000e-003	0.2472		820.5080	820.5080	0.0205	0.0239	828.1525
Total	**0.2738**	**0.2873**	**3.3687**	**8.1000e-003**	**0.9119**	**5.8700e-003**	**0.9177**	**0.2418**	**5.4000e-003**	**0.2472**		**820.5080**	**820.5080**	**0.0205**	**0.0239**	**828.1525**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	0.2869	6.8583	12.6277	0.0199		0.0325	0.0325		0.0325	0.0325	0.0000	1,930.4000	1,930.4000	0.6243		1,946.0083
Total	**0.2869**	**6.8583**	**12.6277**	**0.0199**	**0.0109**	**0.0325**	**0.0434**	**1.1800e-003**	**0.0325**	**0.0337**	**0.0000**	**1,930.4000**	**1,930.4000**	**0.6243**		**1,946.0083**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2738	0.2873	3.3687	8.1000e-003	0.9119	5.8700e-003	0.9177	0.2418	5.4000e-003	0.2472		820.5080	820.5080	0.0205	0.0239	828.1525
Total	**0.2738**	**0.2873**	**3.3687**	**8.1000e-003**	**0.9119**	**5.8700e-003**	**0.9177**	**0.2418**	**5.4000e-003**	**0.2472**		**820.5080**	**820.5080**	**0.0205**	**0.0239**	**828.1525**

3.2 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	1.2366	10.9894	9.3176	0.0199		0.5497	0.5497		0.5057	0.5057		1,930.7201	1,930.7201	0.6244		1,946.3309
Total	**1.2366**	**10.9894**	**9.3176**	**0.0199**	**0.0109**	**0.5497**	**0.5606**	**1.1800e-003**	**0.5057**	**0.5069**		**1,930.7201**	**1,930.7201**	**0.6244**		**1,946.3309**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2532	0.2513	3.0470	7.8600e-003	0.9119	5.5100e-003	0.9174	0.2418	5.0800e-003	0.2468		799.1556	799.1556	0.0181	0.0217	806.0794
Total	**0.2532**	**0.2513**	**3.0470**	**7.8600e-003**	**0.9119**	**5.5100e-003**	**0.9174**	**0.2418**	**5.0800e-003**	**0.2468**		**799.1556**	**799.1556**	**0.0181**	**0.0217**	**806.0794**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	0.2869	6.8583	12.6277	0.0199		0.0325	0.0325		0.0325	0.0325	0.0000	1,930.7201	1,930.7201	0.6244		1,946.3309
Total	**0.2869**	**6.8583**	**12.6277**	**0.0199**	**0.0109**	**0.0325**	**0.0434**	**1.1800e-003**	**0.0325**	**0.0337**	**0.0000**	**1,930.7201**	**1,930.7201**	**0.6244**		**1,946.3309**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2532	0.2513	3.0470	7.8600e-003	0.9119	5.5100e-003	0.9174	0.2418	5.0800e-003	0.2468		799.1556	799.1556	0.0181	0.0217	806.0794
Total	**0.2532**	**0.2513**	**3.0470**	**7.8600e-003**	**0.9119**	**5.5100e-003**	**0.9174**	**0.2418**	**5.0800e-003**	**0.2468**		**799.1556**	**799.1556**	**0.0181**	**0.0217**	**806.0794**

3.2 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	1.1219	9.5273	9.1944	0.0199		0.4722	0.4722		0.4345	0.4345		1,931.1811	1,931.1811	0.6246		1,946.7957
Total	**1.1219**	**9.5273**	**9.1944**	**0.0199**	**0.0109**	**0.4722**	**0.4832**	**1.1800e-003**	**0.4345**	**0.4356**		**1,931.1811**	**1,931.1811**	**0.6246**		**1,946.7957**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Worker	0.2348	0.2206	2.7715	7.6100e-003	0.9119	5.2000e-003	0.9171	0.2418	4.7900e-003	0.2465		778.8140	778.8140	0.0161	0.0198	785.1146
Total	**0.2348**	**0.2206**	**2.7715**	**7.6100e-003**	**0.9119**	**5.2000e-003**	**0.9171**	**0.2418**	**4.7900e-003**	**0.2465**		**778.8140**	**778.8140**	**0.0161**	**0.0198**	**785.1146**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	0.2869	6.8583	12.6277	0.0199		0.0325	0.0325		0.0325	0.0325	0.0000	1,931.1811	1,931.1811	0.6246		1,946.7957
Total	**0.2869**	**6.8583**	**12.6277**	**0.0199**	**0.0109**	**0.0325**	**0.0434**	**1.1800e-003**	**0.0325**	**0.0337**	**0.0000**	**1,931.1811**	**1,931.1811**	**0.6246**		**1,946.7957**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2348	0.2206	2.7715	7.6100e-003	0.9119	5.2000e-003	0.9171	0.2418	4.7900e-003	0.2465		778.8140	778.8140	0.0161	0.0198	785.1146

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Total	**0.2348**	**0.2206**	**2.7715**	**7.6100e-003**	**0.9119**	**5.2000e-003**	**0.9171**	**0.2418**	**4.7900e-003**	**0.2465**		**778.8140**	**778.8140**	**0.0161**	**0.0198**	**785.1146**

3.2 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	1.0679	8.6844	9.1370	0.0200		0.4301	0.4301		0.3957	0.3957		1,931.8700	1,931.8700	0.6248		1,947.4902
Total	**1.0679**	**8.6844**	**9.1370**	**0.0200**	**0.0109**	**0.4301**	**0.4411**	**1.1800e-003**	**0.3957**	**0.3969**		**1,931.8700**	**1,931.8700**	**0.6248**		**1,947.4902**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2180	0.1944	2.4776	7.4100e-003	0.9119	4.9000e-003	0.9168	0.2418	4.5100e-003	0.2463		764.5000	764.5000	0.0142	0.0181	770.2551
Total	**0.2180**	**0.1944**	**2.4776**	**7.4100e-003**	**0.9119**	**4.9000e-003**	**0.9168**	**0.2418**	**4.5100e-003**	**0.2463**		**764.5000**	**764.5000**	**0.0142**	**0.0181**	**770.2551**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0109	0.0000	0.0109	1.1800e-003	0.0000	1.1800e-003			0.0000			0.0000
Off-Road	0.2869	6.8583	12.6277	0.0200		0.0325	0.0325		0.0325	0.0325	0.0000	1,931.8700	1,931.8700	0.6248		1,947.4902
Total	**0.2869**	**6.8583**	**12.6277**	**0.0200**	**0.0109**	**0.0325**	**0.0434**	**1.1800e-003**	**0.0325**	**0.0337**	**0.0000**	**1,931.8700**	**1,931.8700**	**0.6248**		**1,947.4902**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2180	0.1944	2.4776	7.4100e-003	0.9119	4.9000e-003	0.9168	0.2418	4.5100e-003	0.2463		764.5000	764.5000	0.0142	0.0181	770.2551
Total	**0.2180**	**0.1944**	**2.4776**	**7.4100e-003**	**0.9119**	**4.9000e-003**	**0.9168**	**0.2418**	**4.5100e-003**	**0.2463**		**764.5000**	**764.5000**	**0.0142**	**0.0181**	**770.2551**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Trenching - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2946	3.0866	1.9964	8.8200e-003		0.0946	0.0946		0.0870	0.0870		853.7352	853.7352	0.2761		860.6381
Total	**0.2946**	**3.0866**	**1.9964**	**8.8200e-003**		**0.0946**	**0.0946**		**0.0870**	**0.0870**		**853.7352**	**853.7352**	**0.2761**		**860.6381**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1369	0.1437	1.6844	4.0500e-003	0.4559	2.9300e-003	0.4589	0.1209	2.7000e-003	0.1236		410.2540	410.2540	0.0103	0.0120	414.0762
Total	**0.1369**	**0.1437**	**1.6844**	**4.0500e-003**	**0.4559**	**2.9300e-003**	**0.4589**	**0.1209**	**2.7000e-003**	**0.1236**		**410.2540**	**410.2540**	**0.0103**	**0.0120**	**414.0762**

Mitigated Construction On-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1448	2.3343	4.7048	8.8200e-003		0.0145	0.0145		0.0145	0.0145	0.0000	853.7352	853.7352	0.2761		860.6381
Total	**0.1448**	**2.3343**	**4.7048**	**8.8200e-003**		**0.0145**	**0.0145**		**0.0145**	**0.0145**	**0.0000**	**853.7352**	**853.7352**	**0.2761**		**860.6381**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1369	0.1437	1.6844	4.0500e-003	0.4559	2.9300e-003	0.4589	0.1209	2.7000e-003	0.1236		410.2540	410.2540	0.0103	0.0120	414.0762
Total	**0.1369**	**0.1437**	**1.6844**	**4.0500e-003**	**0.4559**	**2.9300e-003**	**0.4589**	**0.1209**	**2.7000e-003**	**0.1236**		**410.2540**	**410.2540**	**0.0103**	**0.0120**	**414.0762**

3.3 Trenching - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Category	lb/day										lb/day					
Off-Road	0.2685	2.5083	1.9753	8.8300e-003		0.0788	0.0788		0.0725	0.0725		854.1842	854.1842	0.2763		861.0907
Total	**0.2685**	**2.5083**	**1.9753**	**8.8300e-003**		**0.0788**	**0.0788**		**0.0725**	**0.0725**		**854.1842**	**854.1842**	**0.2763**		**861.0907**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1266	0.1257	1.5235	3.9300e-003	0.4559	2.7600e-003	0.4587	0.1209	2.5400e-003	0.1234		399.5778	399.5778	9.0700e-003	0.0109	403.0397
Total	**0.1266**	**0.1257**	**1.5235**	**3.9300e-003**	**0.4559**	**2.7600e-003**	**0.4587**	**0.1209**	**2.5400e-003**	**0.1234**		**399.5778**	**399.5778**	**9.0700e-003**	**0.0109**	**403.0397**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1448	2.3343	4.7048	8.8300e-003		0.0145	0.0145		0.0145	0.0145	0.0000	854.1842	854.1842	0.2763		861.0907

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Total	**0.1448**	**2.3343**	**4.7048**	**8.8300e-003**		**0.0145**	**0.0145**		**0.0145**	**0.0145**	**0.0000**	**854.1842**	**854.1842**	**0.2763**		**861.0907**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1266	0.1257	1.5235	3.9300e-003	0.4559	2.7600e-003	0.4587	0.1209	2.5400e-003	0.1234		399.5778	399.5778	9.0700e-003	0.0109	403.0397
Total	**0.1266**	**0.1257**	**1.5235**	**3.9300e-003**	**0.4559**	**2.7600e-003**	**0.4587**	**0.1209**	**2.5400e-003**	**0.1234**		**399.5778**	**399.5778**	**9.0700e-003**	**0.0109**	**403.0397**

3.3 Trenching - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2569	2.1885	1.9718	8.8300e-003		0.0701	0.0701		0.0645	0.0645		854.4952	854.4952	0.2764		861.4042
Total	**0.2569**	**2.1885**	**1.9718**	**8.8300e-003**		**0.0701**	**0.0701**		**0.0645**	**0.0645**		**854.4952**	**854.4952**	**0.2764**		**861.4042**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1174	0.1103	1.3857	3.8000e-003	0.4559	2.6000e-003	0.4585	0.1209	2.3900e-003	0.1233		389.4070	389.4070	8.0300e-003	9.9000e-003	392.5573
Total	**0.1174**	**0.1103**	**1.3857**	**3.8000e-003**	**0.4559**	**2.6000e-003**	**0.4585**	**0.1209**	**2.3900e-003**	**0.1233**		**389.4070**	**389.4070**	**8.0300e-003**	**9.9000e-003**	**392.5573**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1448	2.3343	4.7048	8.8300e-003		0.0145	0.0145		0.0145	0.0145	0.0000	854.4952	854.4952	0.2764		861.4042
Total	**0.1448**	**2.3343**	**4.7048**	**8.8300e-003**		**0.0145**	**0.0145**		**0.0145**	**0.0145**	**0.0000**	**854.4952**	**854.4952**	**0.2764**		**861.4042**

Mitigated Construction Off-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1174	0.1103	1.3857	3.8000e-003	0.4559	2.6000e-003	0.4585	0.1209	2.3900e-003	0.1233		389.4070	389.4070	8.0300e-003	9.9000e-003	392.5573
Total	**0.1174**	**0.1103**	**1.3857**	**3.8000e-003**	**0.4559**	**2.6000e-003**	**0.4585**	**0.1209**	**2.3900e-003**	**0.1233**		**389.4070**	**389.4070**	**8.0300e-003**	**9.9000e-003**	**392.5573**

3.3 Trenching - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2513	2.0051	1.9722	8.8300e-003		0.0647	0.0647		0.0596	0.0596		854.9085	854.9085	0.2765		861.8209
Total	**0.2513**	**2.0051**	**1.9722**	**8.8300e-003**		**0.0647**	**0.0647**		**0.0596**	**0.0596**		**854.9085**	**854.9085**	**0.2765**		**861.8209**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1090	0.0972	1.2388	3.7100e-003	0.4559	2.4500e-003	0.4584	0.1209	2.2600e-003	0.1231		382.2500	382.2500	7.0900e-003	9.0600e-003	385.1275
Total	**0.1090**	**0.0972**	**1.2388**	**3.7100e-003**	**0.4559**	**2.4500e-003**	**0.4584**	**0.1209**	**2.2600e-003**	**0.1231**		**382.2500**	**382.2500**	**7.0900e-003**	**9.0600e-003**	**385.1275**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1448	2.3343	4.7048	8.8300e-003		0.0145	0.0145		0.0145	0.0145	0.0000	854.9085	854.9085	0.2765		861.8209
Total	**0.1448**	**2.3343**	**4.7048**	**8.8300e-003**		**0.0145**	**0.0145**		**0.0145**	**0.0145**	**0.0000**	**854.9085**	**854.9085**	**0.2765**		**861.8209**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1090	0.0972	1.2388	3.7100e-003	0.4559	2.4500e-003	0.4584	0.1209	2.2600e-003	0.1231		382.2500	382.2500	7.0900e-003	9.0600e-003	385.1275
Total	**0.1090**	**0.0972**	**1.2388**	**3.7100e-003**	**0.4559**	**2.4500e-003**	**0.4584**	**0.1209**	**2.2600e-003**	**0.1231**		**382.2500**	**382.2500**	**7.0900e-003**	**9.0600e-003**	**385.1275**

3.4 Well Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	6.9953	67.1294	48.4187	0.2398		2.1804	2.1804		2.0711	2.0711		23,009.9666	23,009.9666	4.8295		23,130.7050
Total	**6.9953**	**67.1294**	**48.4187**	**0.2398**		**2.1804**	**2.1804**		**2.0711**	**2.0711**		**23,009.9666**	**23,009.9666**	**4.8295**		**23,130.7050**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1792	4.4555	0.9781	0.0184	0.6659	0.0799	0.7458	0.1915	0.0764	0.2679		1,939.9737	1,939.9737	0.0143	0.2807	2,023.9726
Worker	0.4107	0.4310	5.0531	0.0122	1.3678	8.8000e-003	1.3766	0.3626	8.1000e-003	0.3707		1,230.7620	1,230.7620	0.0308	0.0359	1,242.2287

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Total	**0.5899**	**4.8865**	**6.0312**	**0.0305**	**2.0337**	**0.0887**	**2.1224**	**0.5541**	**0.0845**	**0.6386**		**3,170.7356**	**3,170.7356**	**0.0451**	**0.3166**	**3,266.2013**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6627	59.1819	119.0781	0.2398		0.3653	0.3653		0.3653	0.3653	0.0000	23,009.9666	23,009.9666	4.8295		23,130.7050
Total	**3.6627**	**59.1819**	**119.0781**	**0.2398**		**0.3653**	**0.3653**		**0.3653**	**0.3653**	**0.0000**	**23,009.9666**	**23,009.9666**	**4.8295**		**23,130.7050**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1792	4.4555	0.9781	0.0184	0.6659	0.0799	0.7458	0.1915	0.0764	0.2679		1,939.9737	1,939.9737	0.0143	0.2807	2,023.9726
Worker	0.4107	0.4310	5.0531	0.0122	1.3678	8.8000e-003	1.3766	0.3626	8.1000e-003	0.3707		1,230.7620	1,230.7620	0.0308	0.0359	1,242.2287
Total	**0.5899**	**4.8865**	**6.0312**	**0.0305**	**2.0337**	**0.0887**	**2.1224**	**0.5541**	**0.0845**	**0.6386**		**3,170.7356**	**3,170.7356**	**0.0451**	**0.3166**	**3,266.2013**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Well Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	6.4703	57.1157	47.6888	0.2391		1.8558	1.8558		1.7637	1.7637		22,941.1819	22,941.1819	4.7916		23,060.9726
Total	**6.4703**	**57.1157**	**47.6888**	**0.2391**		**1.8558**	**1.8558**		**1.7637**	**1.7637**		**22,941.1819**	**22,941.1819**	**4.7916**		**23,060.9726**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1042	3.5581	0.7119	0.0178	0.6659	0.0427	0.7085	0.1915	0.0408	0.2323		1,881.3773	1,881.3773	0.0105	0.2710	1,962.3909
Worker	0.3798	0.3770	4.5704	0.0118	1.3678	8.2700e-003	1.3761	0.3626	7.6100e-003	0.3702		1,198.7335	1,198.7335	0.0272	0.0326	1,209.1191
Total	**0.4840**	**3.9351**	**5.2823**	**0.0296**	**2.0337**	**0.0509**	**2.0846**	**0.5541**	**0.0484**	**0.6025**		**3,080.1108**	**3,080.1108**	**0.0377**	**0.3036**	**3,171.5099**

Mitigated Construction On-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6627	59.1819	119.0781	0.2391		0.3653	0.3653		0.3653	0.3653	0.0000	22,941.1819	22,941.1819	4.7916		23,060.9726
Total	**3.6627**	**59.1819**	**119.0781**	**0.2391**		**0.3653**	**0.3653**		**0.3653**	**0.3653**	**0.0000**	**22,941.1819**	**22,941.1819**	**4.7916**		**23,060.9726**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1042	3.5581	0.7119	0.0178	0.6659	0.0427	0.7085	0.1915	0.0408	0.2323		1,881.3773	1,881.3773	0.0105	0.2710	1,962.3909
Worker	0.3798	0.3770	4.5704	0.0118	1.3678	8.2700e-003	1.3761	0.3626	7.6100e-003	0.3702		1,198.7335	1,198.7335	0.0272	0.0326	1,209.1191
Total	**0.4840**	**3.9351**	**5.2823**	**0.0296**	**2.0337**	**0.0509**	**2.0846**	**0.5541**	**0.0484**	**0.6025**		**3,080.1108**	**3,080.1108**	**0.0377**	**0.3036**	**3,171.5099**

3.4 Well Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Category	lb/day										lb/day					
Off-Road	6.1219	50.0154	47.1875	0.2382		1.6208	1.6208		1.5412	1.5412		22,858.9137	22,858.9137	4.7494		22,977.6477
Total	**6.1219**	**50.0154**	**47.1875**	**0.2382**		**1.6208**	**1.6208**		**1.5412**	**1.5412**		**22,858.9137**	**22,858.9137**	**4.7494**		**22,977.6477**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0443	2.7681	0.5153	0.0171	0.6659	0.0173	0.6832	0.1915	0.0166	0.2080		1,807.1454	1,807.1454	7.4300e-003	0.2589	1,884.4833
Worker	0.3521	0.3309	4.1572	0.0114	1.3678	7.8000e-003	1.3756	0.3626	7.1800e-003	0.3698		1,168.2211	1,168.2211	0.0241	0.0297	1,177.6720
Total	**0.3964**	**3.0990**	**4.6725**	**0.0285**	**2.0337**	**0.0251**	**2.0588**	**0.5541**	**0.0238**	**0.5778**		**2,975.3665**	**2,975.3665**	**0.0315**	**0.2886**	**3,062.1553**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6627	59.1819	119.0781	0.2382		0.3653	0.3653		0.3653	0.3653	0.0000	22,858.9136	22,858.9136	4.7494		22,977.6477

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Total	**3.6627**	**59.1819**	**119.0781**	**0.2382**		**0.3653**	**0.3653**		**0.3653**	**0.3653**	**0.0000**	**22,858.9136**	**22,858.9136**	**4.7494**		**22,977.6477**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0443	2.7681	0.5153	0.0171	0.6659	0.0173	0.6832	0.1915	0.0166	0.2080		1,807.1454	1,807.1454	7.4300e-003	0.2589	1,884.4833
Worker	0.3521	0.3309	4.1572	0.0114	1.3678	7.8000e-003	1.3756	0.3626	7.1800e-003	0.3698		1,168.2211	1,168.2211	0.0241	0.0297	1,177.6720
Total	**0.3964**	**3.0990**	**4.6725**	**0.0285**	**2.0337**	**0.0251**	**2.0588**	**0.5541**	**0.0238**	**0.5778**		**2,975.3665**	**2,975.3665**	**0.0315**	**0.2886**	**3,062.1553**

3.4 Well Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	6.0111	46.1675	47.2375	0.2384		1.4864	1.4864		1.4101	1.4101		22,871.1321	22,871.1321	4.7533		22,989.9647
Total	**6.0111**	**46.1675**	**47.2375**	**0.2384**		**1.4864**	**1.4864**		**1.4101**	**1.4101**		**22,871.1321**	**22,871.1321**	**4.7533**		**22,989.9647**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0423	2.6911	0.4808	0.0168	0.6659	0.0188	0.6847	0.1915	0.0180	0.2094		1,767.6799	1,767.6799	7.1200e-003	0.2524	1,843.0839
Worker	0.3270	0.2916	3.7164	0.0111	1.3678	7.3500e-003	1.3751	0.3626	6.7700e-003	0.3694		1,146.7500	1,146.7500	0.0213	0.0272	1,155.3826
Total	**0.3693**	**2.9827**	**4.1972**	**0.0279**	**2.0337**	**0.0261**	**2.0598**	**0.5541**	**0.0247**	**0.5788**		**2,914.4299**	**2,914.4299**	**0.0284**	**0.2796**	**2,998.4665**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6627	59.1819	119.0781	0.2384		0.3653	0.3653		0.3653	0.3653	0.0000	22,871.1320	22,871.1320	4.7533		22,989.9647
Total	**3.6627**	**59.1819**	**119.0781**	**0.2384**		**0.3653**	**0.3653**		**0.3653**	**0.3653**	**0.0000**	**22,871.1320**	**22,871.1320**	**4.7533**		**22,989.9647**

Mitigated Construction Off-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0423	2.6911	0.4808	0.0168	0.6659	0.0188	0.6847	0.1915	0.0180	0.2094		1,767.6799	1,767.6799	7.1200e-003	0.2524	1,843.0839
Worker	0.3270	0.2916	3.7164	0.0111	1.3678	7.3500e-003	1.3751	0.3626	6.7700e-003	0.3694		1,146.7500	1,146.7500	0.0213	0.0272	1,155.3826
Total	**0.3693**	**2.9827**	**4.1972**	**0.0279**	**2.0337**	**0.0261**	**2.0598**	**0.5541**	**0.0247**	**0.5788**		**2,914.4299**	**2,914.4299**	**0.0284**	**0.2796**	**2,998.4665**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

AVEK - Recovery Facilities

Antelope Valley APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	6.50	Acre	6.50	283,140.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Proposed Extraction Wells/Recovery [Recovery Facilities, Table 2.4-4]

Land Use - Per AVEK Project Description, 6.5 acres for this phase

Construction Phase - Per project schedule, estimated construction is from December 2021 through April 2024.

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 grader (174 hp, 6 hours per day)
2 wheeled loaders (313 hp; 1 hour per day)
1 water truck (200 hp, 1 hour per day)

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 hydraulic excavators (180 hp, 6 hours per day)

Off-road Equipment - Per AVEK AECOM Technical AQ Memo -
2 drilling rigs (500 HP, 24 hrs per day for 90 days)
2 off-highway trucks (479 hp, 4 hours per day)
2 Test pumps (200 hp, 60 hrs per well)
2 skip loader (88 hp, 1 hour per day)
2 small roller compactor (114 hp, 1 hour per day)

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Construction Off-road Equipment Mitigation - Per AVEK AECOM 2017 technical memorandum, AQ-1 mitigation measure applied.

Grading - Excess spoil from excavation operations will incorporated into the recharge basin berms and thus will not be hauled off site.

Trips and VMT - Per the project description, 60 worker trips and 12 vendor trips per day at 60 miles in length.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	230.00	630.00
tblConstructionPhase	NumDays	20.00	630.00
tblConstructionPhase	PhaseEndDate	11/15/2022	4/30/2024
tblConstructionPhase	PhaseEndDate	12/28/2021	4/30/2024
tblConstructionPhase	PhaseEndDate	12/28/2021	4/30/2024
tblConstructionPhase	PhaseStartDate	12/29/2021	12/1/2021
tblConstructionPhase	PhaseStartDate	12/29/2021	12/1/2021
tblGrading	AcresOfGrading	472.50	6.50
tblOffRoadEquipment	HorsePower	402.00	479.00

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblOffRoadEquipment	HorsePower	97.00	313.00
tblOffRoadEquipment	HorsePower	158.00	180.00
tblOffRoadEquipment	HorsePower	221.00	500.00
tblOffRoadEquipment	HorsePower	402.00	479.00
tblOffRoadEquipment	HorsePower	84.00	200.00
tblOffRoadEquipment	HorsePower	65.00	88.00
tblOffRoadEquipment	HorsePower	80.00	114.00
tblOffRoadEquipment	HorsePower	187.00	174.00
tblOffRoadEquipment	LoadFactor	0.37	0.41
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripLength	6.60	60.00
tblTripsAndVMT	VendorTripNumber	46.00	12.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripLength	16.80	60.00
tblTripsAndVMT	WorkerTripNumber	13.00	20.00
tblTripsAndVMT	WorkerTripNumber	5.00	10.00
tblTripsAndVMT	WorkerTripNumber	119.00	30.00

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.1109	1.0226	0.8266	3.5900e-003	0.0418	0.0349	0.0767	0.0107	0.0329	0.0436	0.0000	315.7532	315.7532	0.0606	3.7100e-003	318.3741
2022	1.1411	9.7520	9.0369	0.0403	0.4372	0.3306	0.7679	0.1175	0.3117	0.4292	0.0000	3,546.6429	3,546.6429	0.6792	0.0400	3,575.5405
2023	1.0647	8.4802	8.8144	0.0400	0.4372	0.2855	0.7227	0.1175	0.2692	0.3867	0.0000	3,520.8282	3,520.8282	0.6731	0.0379	3,548.9369
2024	0.3467	2.6185	2.9063	0.0133	0.1486	0.0876	0.2362	0.0396	0.0825	0.1221	0.0000	1,175.3377	1,175.3377	0.2252	0.0122	1,184.6036
Maximum	**1.1411**	**9.7520**	**9.0369**	**0.0403**	**0.4372**	**0.3306**	**0.7679**	**0.1175**	**0.3117**	**0.4292**	**0.0000**	**3,546.6429**	**3,546.6429**	**0.6792**	**0.0400**	**3,575.5405**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0579	0.8487	1.7048	3.5900e-003	0.0418	5.8600e-003	0.0477	0.0107	5.8100e-003	0.0165	0.0000	315.7529	315.7529	0.0606	3.7100e-003	318.3738
2022	0.6365	9.4609	19.1026	0.0403	0.4372	0.0613	0.4985	0.1175	0.0609	0.1784	0.0000	3,546.6393	3,546.6393	0.6792	0.0400	3,575.5369
2023	0.6219	9.3438	18.9618	0.0400	0.4372	0.0579	0.4951	0.1175	0.0576	0.1751	0.0000	3,520.8246	3,520.8246	0.6731	0.0379	3,548.9332

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2024	0.2059	3.1196	6.3021	0.0133	0.1486	0.0194	0.1680	0.0396	0.0193	0.0589	0.0000	1,175.3365	1,175.3365	0.2252	0.0122	1,184.6024
Maximum	**0.6365**	**9.4609**	**19.1026**	**0.0403**	**0.4372**	**0.0613**	**0.4985**	**0.1175**	**0.0609**	**0.1784**	**0.0000**	**3,546.6393**	**3,546.6393**	**0.6792**	**0.0400**	**3,575.5369**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**42.85**	**-4.11**	**-113.45**	**0.00**	**0.00**	**80.45**	**32.95**	**0.00**	**79.38**	**56.31**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**12-1-2021**	**2-28-2022**	2.8557	2.5084
2	**3-1-2022**	**5-31-2022**	2.7477	2.5466
3	**6-1-2022**	**8-31-2022**	2.7454	2.5443
4	**9-1-2022**	**11-30-2022**	2.7201	2.5212
5	**12-1-2022**	**2-28-2023**	2.4743	2.4747
6	**3-1-2023**	**5-31-2023**	2.4083	2.5146
7	**6-1-2023**	**8-31-2023**	2.4064	2.5127
8	**9-1-2023**	**11-30-2023**	2.3840	2.4892
9	**12-1-2023**	**2-29-2024**	2.2733	2.4866
10	**3-1-2024**	**5-31-2024**	1.4831	1.6635
		Highest	2.8557	2.5466

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	12/1/2021	4/30/2024	5	630	
2	Trenching	Trenching	12/1/2021	4/30/2024	5	630	
3	Well Construction	Building Construction	12/1/2021	4/30/2024	5	630	

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 6.5

Acres of Paving: 6.5

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Off-Highway Trucks	1	4.00	479	0.38
Grading	Tractors/Loaders/Backhoes	2	1.00	313	0.41
Trenching	Excavators	2	6.00	180	0.38
Well Construction	Bore/Drill Rigs	2	24.00	500	0.50
Well Construction	Off-Highway Trucks	2	4.00	479	0.38
Well Construction	Pumps	2	24.00	200	0.74
Well Construction	Skid Steer Loaders	2	1.00	88	0.37
Well Construction	Rollers	2	1.00	114	0.38
Grading	Graders	2	6.00	174	0.41

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	5	20.00	0.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	10.00	0.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT
Well Construction	10	30.00	12.00	0.00	60.00	60.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Grading - 2021

Unmitigated Construction On-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.4500e-003	0.0000	3.4500e-003	3.7000e-004	0.0000	3.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0163	0.1527	0.1107	2.3000e-004		7.6000e-003	7.6000e-003		6.9900e-003	6.9900e-003	0.0000	20.1391	20.1391	6.5100e-003	0.0000	20.3020
Total	**0.0163**	**0.1527**	**0.1107**	**2.3000e-004**	**3.4500e-003**	**7.6000e-003**	**0.0111**	**3.7000e-004**	**6.9900e-003**	**7.3600e-003**	**0.0000**	**20.1391**	**20.1391**	**6.5100e-003**	**0.0000**	**20.3020**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-003	3.5100e-003	0.0416	1.0000e-004	0.0103	7.0000e-005	0.0104	2.7300e-003	6.0000e-005	2.7900e-003	0.0000	8.8052	8.8052	2.2000e-004	2.6000e-004	8.8886
Total	**2.9000e-003**	**3.5100e-003**	**0.0416**	**1.0000e-004**	**0.0103**	**7.0000e-005**	**0.0104**	**2.7300e-003**	**6.0000e-005**	**2.7900e-003**	**0.0000**	**8.8052**	**8.8052**	**2.2000e-004**	**2.6000e-004**	**8.8886**

Mitigated Construction On-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.4500e-003	0.0000	3.4500e-003	3.7000e-004	0.0000	3.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.3000e-003	0.0789	0.1452	2.3000e-004		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	20.1391	20.1391	6.5100e-003	0.0000	20.3020
Total	**3.3000e-003**	**0.0789**	**0.1452**	**2.3000e-004**	**3.4500e-003**	**3.7000e-004**	**3.8200e-003**	**3.7000e-004**	**3.7000e-004**	**7.4000e-004**	**0.0000**	**20.1391**	**20.1391**	**6.5100e-003**	**0.0000**	**20.3020**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-003	3.5100e-003	0.0416	1.0000e-004	0.0103	7.0000e-005	0.0104	2.7300e-003	6.0000e-005	2.7900e-003	0.0000	8.8052	8.8052	2.2000e-004	2.6000e-004	8.8886
Total	**2.9000e-003**	**3.5100e-003**	**0.0416**	**1.0000e-004**	**0.0103**	**7.0000e-005**	**0.0104**	**2.7300e-003**	**6.0000e-005**	**2.7900e-003**	**0.0000**	**8.8052**	**8.8052**	**2.2000e-004**	**2.6000e-004**	**8.8886**

3.2 Grading - 2022

Unmitigated Construction On-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.4500e-003	0.0000	3.4500e-003	3.7000e-004	0.0000	3.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1608	1.4286	1.2113	2.5900e-003		0.0715	0.0715		0.0657	0.0657	0.0000	227.6976	227.6976	0.0736	0.0000	229.5386
Total	**0.1608**	**1.4286**	**1.2113**	**2.5900e-003**	**3.4500e-003**	**0.0715**	**0.0749**	**3.7000e-004**	**0.0657**	**0.0661**	**0.0000**	**227.6976**	**227.6976**	**0.0736**	**0.0000**	**229.5386**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0303	0.0347	0.4258	1.0500e-003	0.1162	7.2000e-004	0.1169	0.0309	6.6000e-004	0.0315	0.0000	96.9365	96.9365	2.2000e-003	2.6800e-003	97.7896
Total	**0.0303**	**0.0347**	**0.4258**	**1.0500e-003**	**0.1162**	**7.2000e-004**	**0.1169**	**0.0309**	**6.6000e-004**	**0.0315**	**0.0000**	**96.9365**	**96.9365**	**2.2000e-003**	**2.6800e-003**	**97.7896**

Mitigated Construction On-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.4500e-003	0.0000	3.4500e-003	3.7000e-004	0.0000	3.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0373	0.8916	1.6416	2.5900e-003		4.2200e-003	4.2200e-003		4.2200e-003	4.2200e-003	0.0000	227.6973	227.6973	0.0736	0.0000	229.5384
Total	**0.0373**	**0.8916**	**1.6416**	**2.5900e-003**	**3.4500e-003**	**4.2200e-003**	**7.6700e-003**	**3.7000e-004**	**4.2200e-003**	**4.5900e-003**	**0.0000**	**227.6973**	**227.6973**	**0.0736**	**0.0000**	**229.5384**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0303	0.0347	0.4258	1.0500e-003	0.1162	7.2000e-004	0.1169	0.0309	6.6000e-004	0.0315	0.0000	96.9365	96.9365	2.2000e-003	2.6800e-003	97.7896
Total	**0.0303**	**0.0347**	**0.4258**	**1.0500e-003**	**0.1162**	**7.2000e-004**	**0.1169**	**0.0309**	**6.6000e-004**	**0.0315**	**0.0000**	**96.9365**	**96.9365**	**2.2000e-003**	**2.6800e-003**	**97.7896**

3.2 Grading - 2023

Unmitigated Construction On-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.4500e-003	0.0000	3.4500e-003	3.7000e-004	0.0000	3.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1459	1.2386	1.1953	2.5900e-003		0.0614	0.0614		0.0565	0.0565	0.0000	227.7519	227.7519	0.0737	0.0000	229.5934
Total	**0.1459**	**1.2386**	**1.1953**	**2.5900e-003**	**3.4500e-003**	**0.0614**	**0.0648**	**3.7000e-004**	**0.0565**	**0.0569**	**0.0000**	**227.7519**	**227.7519**	**0.0737**	**0.0000**	**229.5934**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0280	0.0305	0.3873	1.0200e-003	0.1162	6.8000e-004	0.1169	0.0309	6.2000e-004	0.0315	0.0000	94.4597	94.4597	1.9500e-003	2.4400e-003	95.2359
Total	**0.0280**	**0.0305**	**0.3873**	**1.0200e-003**	**0.1162**	**6.8000e-004**	**0.1169**	**0.0309**	**6.2000e-004**	**0.0315**	**0.0000**	**94.4597**	**94.4597**	**1.9500e-003**	**2.4400e-003**	**95.2359**

Mitigated Construction On-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.4500e-003	0.0000	3.4500e-003	3.7000e-004	0.0000	3.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0373	0.8916	1.6416	2.5900e-003		4.2200e-003	4.2200e-003		4.2200e-003	4.2200e-003	0.0000	227.7517	227.7517	0.0737	0.0000	229.5932
Total	**0.0373**	**0.8916**	**1.6416**	**2.5900e-003**	**3.4500e-003**	**4.2200e-003**	**7.6700e-003**	**3.7000e-004**	**4.2200e-003**	**4.5900e-003**	**0.0000**	**227.7517**	**227.7517**	**0.0737**	**0.0000**	**229.5932**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0280	0.0305	0.3873	1.0200e-003	0.1162	6.8000e-004	0.1169	0.0309	6.2000e-004	0.0315	0.0000	94.4597	94.4597	1.9500e-003	2.4400e-003	95.2359
Total	**0.0280**	**0.0305**	**0.3873**	**1.0200e-003**	**0.1162**	**6.8000e-004**	**0.1169**	**0.0309**	**6.2000e-004**	**0.0315**	**0.0000**	**94.4597**	**94.4597**	**1.9500e-003**	**2.4400e-003**	**95.2359**

3.2 Grading - 2024

Unmitigated Construction On-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.4500e-003	0.0000	3.4500e-003	3.7000e-004	0.0000	3.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0465	0.3778	0.3975	8.7000e-004		0.0187	0.0187		0.0172	0.0172	0.0000	76.2365	76.2365	0.0247	0.0000	76.8529
Total	**0.0465**	**0.3778**	**0.3975**	**8.7000e-004**	**3.4500e-003**	**0.0187**	**0.0222**	**3.7000e-004**	**0.0172**	**0.0176**	**0.0000**	**76.2365**	**76.2365**	**0.0247**	**0.0000**	**76.8529**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.6600e-003	8.9900e-003	0.1158	3.3000e-004	0.0389	2.1000e-004	0.0391	0.0103	2.0000e-004	0.0105	0.0000	31.0230	31.0230	5.8000e-004	7.5000e-004	31.2602
Total	**8.6600e-003**	**8.9900e-003**	**0.1158**	**3.3000e-004**	**0.0389**	**2.1000e-004**	**0.0391**	**0.0103**	**2.0000e-004**	**0.0105**	**0.0000**	**31.0230**	**31.0230**	**5.8000e-004**	**7.5000e-004**	**31.2602**

Mitigated Construction On-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.4500e-003	0.0000	3.4500e-003	3.7000e-004	0.0000	3.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0125	0.2983	0.5493	8.7000e-004		1.4100e-003	1.4100e-003		1.4100e-003	1.4100e-003	0.0000	76.2364	76.2364	0.0247	0.0000	76.8528
Total	**0.0125**	**0.2983**	**0.5493**	**8.7000e-004**	**3.4500e-003**	**1.4100e-003**	**4.8600e-003**	**3.7000e-004**	**1.4100e-003**	**1.7800e-003**	**0.0000**	**76.2364**	**76.2364**	**0.0247**	**0.0000**	**76.8528**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.6600e-003	8.9900e-003	0.1158	3.3000e-004	0.0389	2.1000e-004	0.0391	0.0103	2.0000e-004	0.0105	0.0000	31.0230	31.0230	5.8000e-004	7.5000e-004	31.2602
Total	**8.6600e-003**	**8.9900e-003**	**0.1158**	**3.3000e-004**	**0.0389**	**2.1000e-004**	**0.0391**	**0.0103**	**2.0000e-004**	**0.0105**	**0.0000**	**31.0230**	**31.0230**	**5.8000e-004**	**7.5000e-004**	**31.2602**

3.3 Trenching - 2021

Unmitigated Construction On-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.3900e-003	0.0355	0.0230	1.0000e-004		1.0900e-003	1.0900e-003		1.0000e-003	1.0000e-003	0.0000	8.9067	8.9067	2.8800e-003	0.0000	8.9787
Total	**3.3900e-003**	**0.0355**	**0.0230**	**1.0000e-004**		**1.0900e-003**	**1.0900e-003**		**1.0000e-003**	**1.0000e-003**	**0.0000**	**8.9067**	**8.9067**	**2.8800e-003**	**0.0000**	**8.9787**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4500e-003	1.7600e-003	0.0208	5.0000e-005	5.1400e-003	3.0000e-005	5.1700e-003	1.3600e-003	3.0000e-005	1.4000e-003	0.0000	4.4026	4.4026	1.1000e-004	1.3000e-004	4.4443
Total	**1.4500e-003**	**1.7600e-003**	**0.0208**	**5.0000e-005**	**5.1400e-003**	**3.0000e-005**	**5.1700e-003**	**1.3600e-003**	**3.0000e-005**	**1.4000e-003**	**0.0000**	**4.4026**	**4.4026**	**1.1000e-004**	**1.3000e-004**	**4.4443**

Mitigated Construction On-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.6600e-003	0.0268	0.0541	1.0000e-004		1.7000e-004	1.7000e-004		1.7000e-004	1.7000e-004	0.0000	8.9067	8.9067	2.8800e-003	0.0000	8.9787
Total	**1.6600e-003**	**0.0268**	**0.0541**	**1.0000e-004**		**1.7000e-004**	**1.7000e-004**		**1.7000e-004**	**1.7000e-004**	**0.0000**	**8.9067**	**8.9067**	**2.8800e-003**	**0.0000**	**8.9787**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4500e-003	1.7600e-003	0.0208	5.0000e-005	5.1400e-003	3.0000e-005	5.1700e-003	1.3600e-003	3.0000e-005	1.4000e-003	0.0000	4.4026	4.4026	1.1000e-004	1.3000e-004	4.4443
Total	**1.4500e-003**	**1.7600e-003**	**0.0208**	**5.0000e-005**	**5.1400e-003**	**3.0000e-005**	**5.1700e-003**	**1.3600e-003**	**3.0000e-005**	**1.4000e-003**	**0.0000**	**4.4026**	**4.4026**	**1.1000e-004**	**1.3000e-004**	**4.4443**

3.3 Trenching - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Off-Road	0.0349	0.3261	0.2568	1.1500e-003		0.0102	0.0102		9.4200e-003	9.4200e-003	0.0000	100.7374	100.7374	0.0326	0.0000	101.5519
Total	**0.0349**	**0.3261**	**0.2568**	**1.1500e-003**		**0.0102**	**0.0102**		**9.4200e-003**	**9.4200e-003**	**0.0000**	**100.7374**	**100.7374**	**0.0326**	**0.0000**	**101.5519**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0151	0.0174	0.2129	5.3000e-004	0.0581	3.6000e-004	0.0585	0.0154	3.3000e-004	0.0158	0.0000	48.4683	48.4683	1.1000e-003	1.3400e-003	48.8948
Total	**0.0151**	**0.0174**	**0.2129**	**5.3000e-004**	**0.0581**	**3.6000e-004**	**0.0585**	**0.0154**	**3.3000e-004**	**0.0158**	**0.0000**	**48.4683**	**48.4683**	**1.1000e-003**	**1.3400e-003**	**48.8948**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0188	0.3035	0.6116	1.1500e-003		1.8800e-003	1.8800e-003		1.8800e-003	1.8800e-003	0.0000	100.7373	100.7373	0.0326	0.0000	101.5518
Total	**0.0188**	**0.3035**	**0.6116**	**1.1500e-003**		**1.8800e-003**	**1.8800e-003**		**1.8800e-003**	**1.8800e-003**	**0.0000**	**100.7373**	**100.7373**	**0.0326**	**0.0000**	**101.5518**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0151	0.0174	0.2129	5.3000e-004	0.0581	3.6000e-004	0.0585	0.0154	3.3000e-004	0.0158	0.0000	48.4683	48.4683	1.1000e-003	1.3400e-003	48.8948
Total	**0.0151**	**0.0174**	**0.2129**	**5.3000e-004**	**0.0581**	**3.6000e-004**	**0.0585**	**0.0154**	**3.3000e-004**	**0.0158**	**0.0000**	**48.4683**	**48.4683**	**1.1000e-003**	**1.3400e-003**	**48.8948**

3.3 Trenching - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0334	0.2845	0.2563	1.1500e-003		9.1100e-003	9.1100e-003		8.3800e-003	8.3800e-003	0.0000	100.7741	100.7741	0.0326	0.0000	101.5889
Total	**0.0334**	**0.2845**	**0.2563**	**1.1500e-003**		**9.1100e-003**	**9.1100e-003**		**8.3800e-003**	**8.3800e-003**	**0.0000**	**100.7741**	**100.7741**	**0.0326**	**0.0000**	**101.5889**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0140	0.0152	0.1936	5.1000e-004	0.0581	3.4000e-004	0.0584	0.0154	3.1000e-004	0.0157	0.0000	47.2298	47.2298	9.7000e-004	1.2200e-003	47.6180
Total	**0.0140**	**0.0152**	**0.1936**	**5.1000e-004**	**0.0581**	**3.4000e-004**	**0.0584**	**0.0154**	**3.1000e-004**	**0.0157**	**0.0000**	**47.2298**	**47.2298**	**9.7000e-004**	**1.2200e-003**	**47.6180**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0188	0.3035	0.6116	1.1500e-003		1.8800e-003	1.8800e-003		1.8800e-003	1.8800e-003	0.0000	100.7739	100.7739	0.0326	0.0000	101.5887
Total	**0.0188**	**0.3035**	**0.6116**	**1.1500e-003**		**1.8800e-003**	**1.8800e-003**		**1.8800e-003**	**1.8800e-003**	**0.0000**	**100.7739**	**100.7739**	**0.0326**	**0.0000**	**101.5887**

Mitigated Construction Off-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0140	0.0152	0.1936	5.1000e-004	0.0581	3.4000e-004	0.0584	0.0154	3.1000e-004	0.0157	0.0000	47.2298	47.2298	9.7000e-004	1.2200e-003	47.6180
Total	**0.0140**	**0.0152**	**0.1936**	**5.1000e-004**	**0.0581**	**3.4000e-004**	**0.0584**	**0.0154**	**3.1000e-004**	**0.0157**	**0.0000**	**47.2298**	**47.2298**	**9.7000e-004**	**1.2200e-003**	**47.6180**

3.3 Trenching - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0109	0.0872	0.0858	3.8000e-004		2.8200e-003	2.8200e-003		2.5900e-003	2.5900e-003	0.0000	33.7369	33.7369	0.0109	0.0000	34.0096
Total	**0.0109**	**0.0872**	**0.0858**	**3.8000e-004**		**2.8200e-003**	**2.8200e-003**		**2.5900e-003**	**2.5900e-003**	**0.0000**	**33.7369**	**33.7369**	**0.0109**	**0.0000**	**34.0096**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.3300e-003	4.4900e-003	0.0579	1.7000e-004	0.0194	1.1000e-004	0.0196	5.1600e-003	1.0000e-004	5.2600e-003	0.0000	15.5115	15.5115	2.9000e-004	3.7000e-004	15.6301
Total	**4.3300e-003**	**4.4900e-003**	**0.0579**	**1.7000e-004**	**0.0194**	**1.1000e-004**	**0.0196**	**5.1600e-003**	**1.0000e-004**	**5.2600e-003**	**0.0000**	**15.5115**	**15.5115**	**2.9000e-004**	**3.7000e-004**	**15.6301**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.3000e-003	0.1015	0.2047	3.8000e-004		6.3000e-004	6.3000e-004		6.3000e-004	6.3000e-004	0.0000	33.7368	33.7368	0.0109	0.0000	34.0096
Total	**6.3000e-003**	**0.1015**	**0.2047**	**3.8000e-004**		**6.3000e-004**	**6.3000e-004**		**6.3000e-004**	**6.3000e-004**	**0.0000**	**33.7368**	**33.7368**	**0.0109**	**0.0000**	**34.0096**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Worker	4.3300e-003	4.4900e-003	0.0579	1.7000e-004	0.0194	1.1000e-004	0.0196	5.1600e-003	1.0000e-004	5.2600e-003	0.0000	15.5115	15.5115	2.9000e-004	3.7000e-004	15.6301
Total	**4.3300e-003**	**4.4900e-003**	**0.0579**	**1.7000e-004**	**0.0194**	**1.1000e-004**	**0.0196**	**5.1600e-003**	**1.0000e-004**	**5.2600e-003**	**0.0000**	**15.5115**	**15.5115**	**2.9000e-004**	**3.7000e-004**	**15.6301**

3.4 Well Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0805	0.7720	0.5568	2.7600e-003		0.0251	0.0251		0.0238	0.0238	0.0000	240.0543	240.0543	0.0504	0.0000	241.3140
Total	**0.0805**	**0.7720**	**0.5568**	**2.7600e-003**		**0.0251**	**0.0251**		**0.0238**	**0.0238**	**0.0000**	**240.0543**	**240.0543**	**0.0504**	**0.0000**	**241.3140**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0500e-003	0.0519	0.0112	2.1000e-004	7.5300e-003	9.2000e-004	8.4500e-003	2.1700e-003	8.8000e-004	3.0500e-003	0.0000	20.2373	20.2373	1.5000e-004	2.9300e-003	21.1138
Worker	4.3500e-003	5.2700e-003	0.0625	1.4000e-004	0.0154	1.0000e-004	0.0155	4.0900e-003	9.0000e-005	4.1900e-003	0.0000	13.2079	13.2079	3.3000e-004	3.9000e-004	13.3328
Total	**6.4000e-003**	**0.0572**	**0.0737**	**3.5000e-004**	**0.0230**	**1.0200e-003**	**0.0240**	**6.2600e-003**	**9.7000e-004**	**7.2400e-003**	**0.0000**	**33.4452**	**33.4452**	**4.8000e-004**	**3.3200e-003**	**34.4467**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0421	0.6806	1.3694	2.7600e-003		4.2000e-003	4.2000e-003		4.2000e-003	4.2000e-003	0.0000	240.0541	240.0541	0.0504	0.0000	241.3137
Total	**0.0421**	**0.6806**	**1.3694**	**2.7600e-003**		**4.2000e-003**	**4.2000e-003**		**4.2000e-003**	**4.2000e-003**	**0.0000**	**240.0541**	**240.0541**	**0.0504**	**0.0000**	**241.3137**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0500e-003	0.0519	0.0112	2.1000e-004	7.5300e-003	9.2000e-004	8.4500e-003	2.1700e-003	8.8000e-004	3.0500e-003	0.0000	20.2373	20.2373	1.5000e-004	2.9300e-003	21.1138
Worker	4.3500e-003	5.2700e-003	0.0625	1.4000e-004	0.0154	1.0000e-004	0.0155	4.0900e-003	9.0000e-005	4.1900e-003	0.0000	13.2079	13.2079	3.3000e-004	3.9000e-004	13.3328
Total	**6.4000e-003**	**0.0572**	**0.0737**	**3.5000e-004**	**0.0230**	**1.0200e-003**	**0.0240**	**6.2600e-003**	**9.7000e-004**	**7.2400e-003**	**0.0000**	**33.4452**	**33.4452**	**4.8000e-004**	**3.3200e-003**	**34.4467**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.8411	7.4250	6.1995	0.0311		0.2413	0.2413		0.2293	0.2293	0.0000	2,705.5457	2,705.5457	0.5651	0.0000	2,719.6731
Total	**0.8411**	**7.4250**	**6.1995**	**0.0311**		**0.2413**	**0.2413**		**0.2293**	**0.2293**	**0.0000**	**2,705.5457**	**2,705.5457**	**0.5651**	**0.0000**	**2,719.6731**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0135	0.4680	0.0920	2.3200e-003	0.0852	5.5500e-003	0.0907	0.0246	5.3000e-003	0.0299	0.0000	221.8527	221.8527	1.2400e-003	0.0320	231.4081
Worker	0.0454	0.0521	0.6386	1.5800e-003	0.1743	1.0700e-003	0.1754	0.0463	9.9000e-004	0.0473	0.0000	145.4048	145.4048	3.3000e-003	4.0200e-003	146.6844
Total	**0.0589**	**0.5201**	**0.7306**	**3.9000e-003**	**0.2595**	**6.6200e-003**	**0.2661**	**0.0708**	**6.2900e-003**	**0.0771**	**0.0000**	**367.2575**	**367.2575**	**4.5400e-003**	**0.0360**	**378.0925**

Mitigated Construction On-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4762	7.6936	15.4801	0.0311		0.0475	0.0475		0.0475	0.0475	0.0000	2,705.5425	2,705.5425	0.5651	0.0000	2,719.6699
Total	**0.4762**	**7.6936**	**15.4801**	**0.0311**		**0.0475**	**0.0475**		**0.0475**	**0.0475**	**0.0000**	**2,705.5425**	**2,705.5425**	**0.5651**	**0.0000**	**2,719.6699**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0135	0.4680	0.0920	2.3200e-003	0.0852	5.5500e-003	0.0907	0.0246	5.3000e-003	0.0299	0.0000	221.8527	221.8527	1.2400e-003	0.0320	231.4081
Worker	0.0454	0.0521	0.6386	1.5800e-003	0.1743	1.0700e-003	0.1754	0.0463	9.9000e-004	0.0473	0.0000	145.4048	145.4048	3.3000e-003	4.0200e-003	146.6844
Total	**0.0589**	**0.5201**	**0.7306**	**3.9000e-003**	**0.2595**	**6.6200e-003**	**0.2661**	**0.0708**	**6.2900e-003**	**0.0771**	**0.0000**	**367.2575**	**367.2575**	**4.5400e-003**	**0.0360**	**378.0925**

3.4 Well Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Off-Road	0.7959	6.5020	6.1344	0.0310		0.2107	0.2107		0.2004	0.2004	0.0000	2,695.8435	2,695.8435	0.5601	0.0000	2,709.8463
Total	**0.7959**	**6.5020**	**6.1344**	**0.0310**		**0.2107**	**0.2107**		**0.2004**	**0.2004**	**0.0000**	**2,695.8435**	**2,695.8435**	**0.5601**	**0.0000**	**2,709.8463**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.7200e-003	0.3637	0.0666	2.2300e-003	0.0852	2.2500e-003	0.0874	0.0246	2.1500e-003	0.0267	0.0000	213.0797	213.0797	8.8000e-004	0.0305	222.2005
Worker	0.0419	0.0457	0.5809	1.5300e-003	0.1743	1.0100e-003	0.1753	0.0463	9.3000e-004	0.0472	0.0000	141.6895	141.6895	2.9200e-003	3.6600e-003	142.8539
Total	**0.0477**	**0.4094**	**0.6475**	**3.7600e-003**	**0.2595**	**3.2600e-003**	**0.2628**	**0.0708**	**3.0800e-003**	**0.0739**	**0.0000**	**354.7692**	**354.7692**	**3.8000e-003**	**0.0342**	**365.0544**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4762	7.6936	15.4801	0.0310		0.0475	0.0475		0.0475	0.0475	0.0000	2,695.8403	2,695.8403	0.5601	0.0000	2,709.8431
Total	**0.4762**	**7.6936**	**15.4801**	**0.0310**		**0.0475**	**0.0475**		**0.0475**	**0.0475**	**0.0000**	**2,695.8403**	**2,695.8403**	**0.5601**	**0.0000**	**2,709.8431**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.7200e-003	0.3637	0.0666	2.2300e-003	0.0852	2.2500e-003	0.0874	0.0246	2.1500e-003	0.0267	0.0000	213.0797	213.0797	8.8000e-004	0.0305	222.2005
Worker	0.0419	0.0457	0.5809	1.5300e-003	0.1743	1.0100e-003	0.1753	0.0463	9.3000e-004	0.0472	0.0000	141.6895	141.6895	2.9200e-003	3.6600e-003	142.8539
Total	**0.0477**	**0.4094**	**0.6475**	**3.7600e-003**	**0.2595**	**3.2600e-003**	**0.2628**	**0.0708**	**3.0800e-003**	**0.0739**	**0.0000**	**354.7692**	**354.7692**	**3.8000e-003**	**0.0342**	**365.0544**

3.4 Well Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2615	2.0083	2.0548	0.0104		0.0647	0.0647		0.0613	0.0613	0.0000	902.5529	902.5529	0.1876	0.0000	907.2423
Total	**0.2615**	**2.0083**	**2.0548**	**0.0104**		**0.0647**	**0.0647**		**0.0613**	**0.0613**	**0.0000**	**902.5529**	**902.5529**	**0.1876**	**0.0000**	**907.2423**

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.8300e-003	0.1183	0.0208	7.3000e-004	0.0285	8.2000e-004	0.0293	8.2100e-003	7.8000e-004	8.9900e-003	0.0000	69.7425	69.7425	2.8000e-004	9.9600e-003	72.7181
Worker	0.0130	0.0135	0.1737	5.0000e-004	0.0583	3.2000e-004	0.0587	0.0155	2.9000e-004	0.0158	0.0000	46.5345	46.5345	8.6000e-004	1.1200e-003	46.8903
Total	**0.0148**	**0.1318**	**0.1945**	**1.2300e-003**	**0.0868**	**1.1400e-003**	**0.0880**	**0.0237**	**1.0700e-003**	**0.0248**	**0.0000**	**116.2770**	**116.2770**	**1.1400e-003**	**0.0111**	**119.6084**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1593	2.5744	5.1799	0.0104		0.0159	0.0159		0.0159	0.0159	0.0000	902.5518	902.5518	0.1876	0.0000	907.2412
Total	**0.1593**	**2.5744**	**5.1799**	**0.0104**		**0.0159**	**0.0159**		**0.0159**	**0.0159**	**0.0000**	**902.5518**	**902.5518**	**0.1876**	**0.0000**	**907.2412**

Mitigated Construction Off-Site

AVEK - Recovery Facilities - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.8300e-003	0.1183	0.0208	7.3000e-004	0.0285	8.2000e-004	0.0293	8.2100e-003	7.8000e-004	8.9900e-003	0.0000	69.7425	69.7425	2.8000e-004	9.9600e-003	72.7181
Worker	0.0130	0.0135	0.1737	5.0000e-004	0.0583	3.2000e-004	0.0587	0.0155	2.9000e-004	0.0158	0.0000	46.5345	46.5345	8.6000e-004	1.1200e-003	46.8903
Total	**0.0148**	**0.1318**	**0.1945**	**1.2300e-003**	**0.0868**	**1.1400e-003**	**0.0880**	**0.0237**	**1.0700e-003**	**0.0248**	**0.0000**	**116.2770**	**116.2770**	**1.1400e-003**	**0.0111**	**119.6084**

Appendix C
Biological Resources Evaluation

ANTELOPE VALLEY-EAST KERN WATER AGENCY'S HIGH DESERT WATER BANK PROJECT

LOS ANGELES COUNTY, CALIFORNIA

Biological Resources Analysis

Prepared For:

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September 2021

ANTELOPE VALLEY-EAST KERN WATER AGENCY'S HIGH DESERT WATER BANK PROJECT

LOS ANGELES COUNTY, CALIFORNIA

Biological Resources Analysis

The undersigned certify that the statements furnished in this report and exhibits present data and information required for this biological evaluation, and the facts, statements, and information presented is a complete and accurate account of the findings and conclusions to the best of our knowledge and beliefs.

Travis J. McGill
Director/Biologist

Thomas J. McGill, Ph.D.
Managing Director

September 2021

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APPENDIX

Appendix A Site Plans
Appendix B Site Photographs
Appendix C Potentially Occurring Special-Status Biological Resources
Appendix D Mitigation Monitoring and Reporting Program

Section 1 Introduction

This report contains the findings of ELMT Consulting's (ELMT) updated habitat and jurisdictional assessment for Antelope Valley-East Kern Water Agency's (Agency) High Desert Water Bank Project (Project) located west of the City of Lancaster, near the community of Neenach in unincorporated Los Angeles County, California.

In 2017, the Agency evaluated the Project under the California Environmental Quality Act (CEQA) and adopted a Mitigated Negative Declaration (MND). The Project involved the development and operation of a groundwater bank on approximately 1,500 acres with 322 acres designated for habitat management. Recharge would occur through the development of low, shallow berms over approximately 1,200 acres, with approximately 400 acres being used for recharge at any given time. Recharge activities would be similar to the agricultural practice of flooding where the low berms would constantly be re-established.

Since the time of the MND adoption, several design components changed, including the recharge areas and methods and the location of the habitat management area. Under the new design, recharge would occur over 890 acres of fixed, engineered basins. Low, shallow berms would be used in the two large drainages that traverse the site. The location of the 322 acres designated for habitat management also was revised.

The original habitat assessment and associated mitigation measures were identified in a 2017 report by AECOM, "Antelope Valley-East Kern Water Agency, High Desert Water Bank Project, Revised Biological Technical Report." This updated habitat assessment was conducted to:

- Update existing site conditions since the time of the 2017 biological assessment;
- Assess the probability of occurrence of special-status[1] plant and wildlife species that could pose a constraint to project implementation under the new design;
- Provide an analysis of the new habitat management locations to ensure that the revised locations of the habitat management lands were of equal or greater value;
- Assess if the mitigation measures provided in the previous biological assessment were adequate based on the revised design;
- Evaluate the site's natural drainage features, ponded areas, and/or water bodies previously identified to determine areas under the new design that have the potential to fall under the regulatory authority of the of the United States Army Corps of Engineers (Corps), Regional Water Quality Control Board (Regional Board), or California Department of Fish and Wildlife (CDFW) pursuant to Sections 401 and 404 of the Federal Clean Water Act (CWA), the California Porter-Cologne Water Quality Control Act, and Section 1600 *et seq.* of the Fish and Game Code.

[1] As used in this report, "special-status" refers to plant and wildlife species that are federally or State listed, proposed, or candidates; plant species that have been designated a California Native Plant Society (CNPS) Rare Plant Rank; and wildlife species that are designated by the California Department of Fish and Wildlife (CDFW) as fully protected, species of special concern, or watch list species.

For this evaluation, ELMT biologists Travis J. McGill and Jacob H. Lloyd Davies conducted a field survey and evaluated the condition of the habitat within the project site on August 19, 2021.

1.1 PROJECT LOCATION

The project site is generally located north of State Route 138, east of Interstate 5, south of the Tehachapi Mountains, and west of State Route 14 in unincorporated Los Angeles County, California (Exhibit 1, *Regional Vicinity*). The site is depicted on the La Liebre Ranch quadrangle of the United States Geological Survey's (USGS) 7.5-minute topographic map series within Sections 1, 2, 11, and 12 of Township 8 North, Range 17 West (Exhibit 2, *Site Vicinity*). Specifically, the project site is bounded to the north by West Avenue A, to the west by 300th Street West, to the south by the California Aqueduct, and to the west by 180th Street West within the following Assessor Parcel Numbers (APNs) (Exhibit 3, *Project Site*):

3275-002-001	3275-003-002	3275-021-009	3275-021-029
3275-002-002	3275-003-003	3275-021-010	3275-021-030
3275-002-003	3275-003-004	3275-021-011	3275-021-031
3275-002-004	3275-003-005	3275-021-012	3275-021-032
3275-002-005	3275-003-006	3275-021-013	3275-021-033
3275-002-006	3275-003-007	3275-021-014	3275-021-034
3275-002-007	3275-003-008	3275-021-015	3275-021-035
3275-002-008	3275-003-009	3275-021-016	3275-021-036
3275-002-009	3275-003-010	3275-021-017	3275-021-037
3275-002-010	3275-006-007	3275-021-018	3275-021-038
3275-002-011	3275-006-905	3275-021-019	3275-021-039
3275-002-012	3275-007-011	3275-021-020	3275-021-040
3275-002-013	3275-021-001	3275-021-021	3275-021-041
3275-002-014	3275-021-002	3275-021-022	3275-021-042
3275-002-015	3275-021-003	3275-021-023	3275-021-043
3275-002-016	3275-021-004	3275-021-024	3275-021-044
3275-002-017	3275-021-005	3275-021-025	3275-021-045
3275-002-018	3275-021-006	3275-021-026	3275-021-046
3275-002-019	3275-021-007	3275-021-027	
3275-002-020	3275-021-008	3275-021-028	

1.2 PROJECT DESCRIPTON

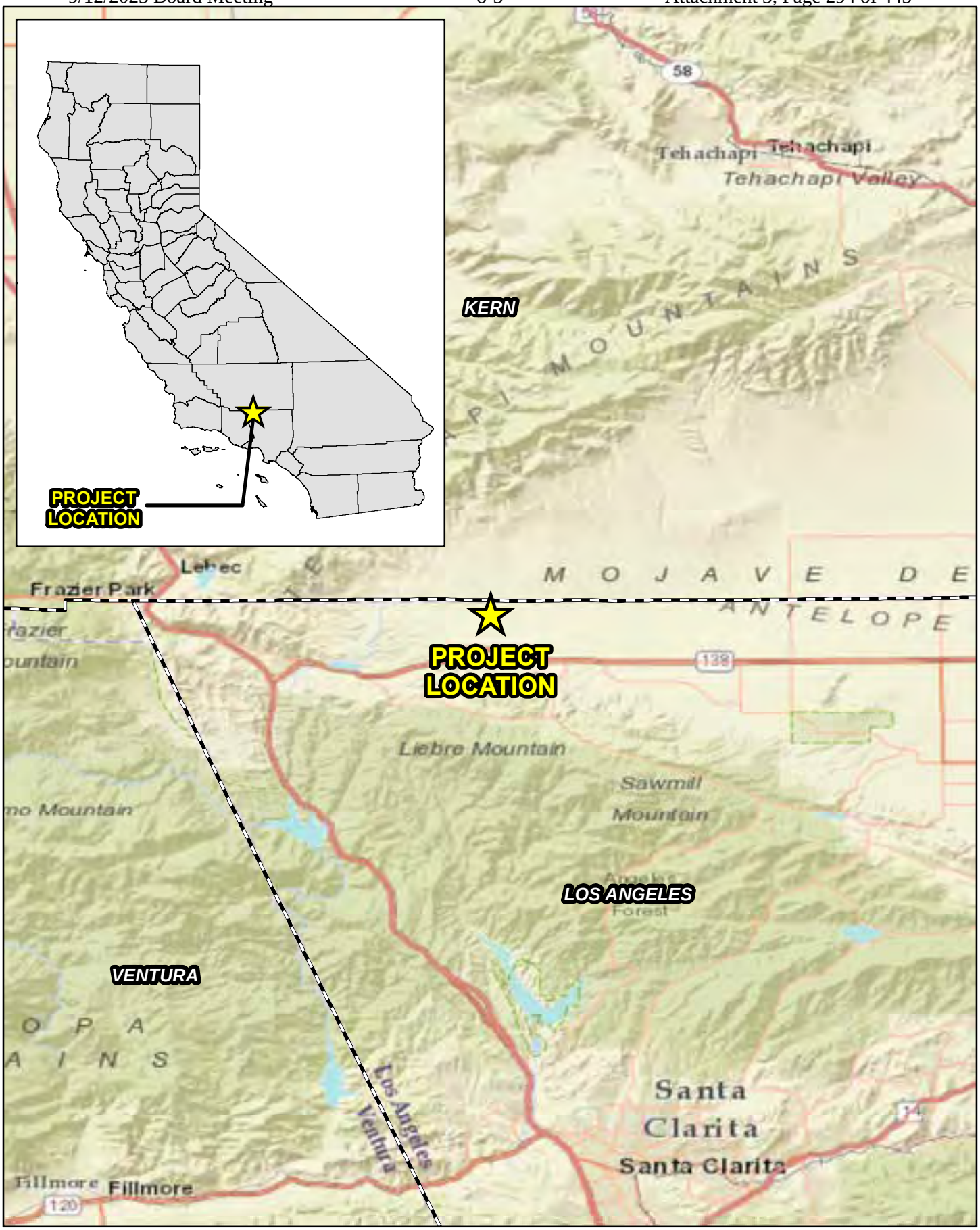
The Project involves the development and operation of a groundwater bank on approximately 1,500 acres of land in the western edges of the Antelope Valley. The project would store State Water Project (SWP) water supplies from the Agency and other banking participants during wet weather year periods when supplies exceed demands and would recover the water for use by the Agency and its partners during dry weather years when demands exceed supplies and other times when there are disruptions to State Water Project supplies. Implementation of this project will require the construction of monitoring and production

water wells, turnout(s) from the California Aqueduct, East Branch, underground and above ground pipelines, recharge basins, and water storage and booster pump facilities.

Since the time of the MND adoption in 2017, various components of the Project design were changed. The following table identifies the various components, the original design and the changes that occurred.

Feature	**2017 Original Project Design**	**2021 Revised Project Design**
Capacity	280,000 AF groundwater Bank 70,000 AF/Yr Recharge/Recovery	No change
Aqueduct Turnout	1 new 150 cfs; rehab existing	1 new 250 cfs; no rehab of existing
Recharge Facilities	1,200 acres low earthen berms with 400 acres inundated annually, rotating throughout site; berms designed to be sacrificial during large storm events and reconstructed.	890 acres consisting of 42 engineered and flood-protected basins defined by engineered, compacted berms, with 890 acres available for use annually, with 890 acres anticipated to be inundated over eight months.
Recovery Facilities	18 (2,500 gpm each)	28 (1,800 to 2,200 gpm each)
Transmission Facilities	Above ground: 3.5 miles Below ground: 9.5 miles	Above ground: 0 Below ground: 11.5 miles
Monitoring Wells	5	No change
Pump Station and pump station building, storage tank, maintenance	Included	Storage tank or Pump Station Building no longer required
Habitat Management Lands	322 Acres	No change to acreage; location change only

Refer to Appendix A, Site Plans.



ANTELOPE VALLEY-EAST KERN WATER AGENCY'S HIGH DESERT WATER BANK PROJECT
BIOLOGICAL RESOURCES REPORT

ELMT CONSULTING

0 2.5 5 10 Miles

Source: World Street Map, Los Angeles County

Regional Vicinity

Exhibit 1330

ANTELOPE VALLEY-EAST KERN WATER AGENCY'S HIGH DESERT WATER BANK PROJECT
BIOLOGICAL RESOURCES REPORT

ELMT CONSULTING

0 1,000 2,000 4,000 Feet

Source: USA Topographic Map, Los Angeles County

Site Vicinity

Exhibit 1331

ANTELOPE VALLEY-EAST KERN WATER AGENCY'S HIGH DESERT WATER BANK PROJECT
BIOLOGICAL RESOURCES REPORT

ELMT

0 625 1,250 2,500 Feet

Source: ESRI Aerial Imagery, World Transportation, Los Angeles County

Project Site

Exhibit 1332

Section 2 Methodology

A literature review and records search were conducted to determine which special-status biological resources have the potential to occur on or within the general vicinity of the project site. In addition to the literature review, a general habitat assessment or field investigation of the project site was conducted. The field investigation was conducted to document existing conditions within the project site and assess the potential for special-status biological resources to occur.

2.1 LITERATURE REVIEW

Prior to conducting the field investigation, a literature review and records search was conducted for special-status biological resources potentially occurring on or within the vicinity of the project site. Previously recorded occurrences of special-status plant and wildlife species and their proximity to the project site were determined through a query of the CDFW QuickView Tool in the Biogeographic Information and Observation System (BIOS), CNDDB Rarefind 5, the California Native Plant Society's (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants of California, Calflora Database, compendia of special-status species published by CDFW, and the United States Fish and Wildlife Service (USFWS) species listings.

All available reports, survey results, and literature detailing the biological resources previously observed on or within the vicinity of the project site were reviewed to understand existing site conditions and note the extent of any disturbances that have occurred on the project site that would otherwise limit the distribution of special-status biological resources. Standard field guides and texts were reviewed for specific habitat requirements of special-status and non-special-status biological resources, as well as the following resources:

- Google Earth Pro historic aerial imagery (1985-2018);
- United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS), Soil Survey[2];
- USFWS Critical Habitat designations for Threatened and Endangered Species; and
- USFWS National Wetlands Inventory (NWI).
- AECOM, 2017, Antelope Valley-East Kern Water Agency, High Desert Water Bank Project, Revised Biological Technical Report

The literature review provided a baseline from which to inventory the biological resources potentially occurring on the subject property. The CNDDB database was used, in conjunction with ArcGIS software, to locate the nearest recorded occurrences of special-status species and determine the distance from the project site.

[2] A soil series is defined as a group of soils with similar profiles developed from similar parent materials under comparable climatic and vegetation conditions. These profiles include major horizons with similar thickness, arrangement, and other important characteristics, which may promote favorable conditions for certain biological resources.

2.2 FIELD INVESTIGATION

ELMT biologists Travis J. McGill and Jacob H. Lloyd Davies evaluated the extent and conditions of the plant communities found within the boundaries of the project site on August 19, 2021. Plant communities identified on aerial photographs during the literature review were verified in the field by walking meandering transects through the on-site plant communities and along boundaries between plant communities. The plant communities were evaluated for their potential to support special-status plant and wildlife species. In addition, field staff identified any natural corridors and linkages that may support the movement of wildlife through the area. Special attention was given to special-status habitats and/or undeveloped areas, which have higher potentials to support special-status plant and wildlife species.

All plant and wildlife species observed, as well as dominant plant species within each plant community, were recorded. Wildlife detections were made through observation of scat, trails, tracks, burrows, nests, and/or visual and aural observation. In addition, site characteristics such as soil condition, topography, hydrology, anthropogenic disturbances, indicator species, condition of on-site plant communities, and presence of potential jurisdictional drainage and/or wetland features were noted.

2.3 SOIL SERIES ASSESSMENT

On-site and adjoining soils were researched prior to the field survey using the USDA NRCS Soil Survey for Los Angeles County, Antelope Valley Area. In addition, a review of the local geological conditions and historical aerial photographs was conducted to assess the ecological changes that the project site has undergone.

2.4 PLANT COMMUNITIES

Plant communities were mapped using 7.5-minute USGS topographic base maps and aerial photography. The plant communities were classified in accordance with Sawyer, Keeler-Wolf and Evens (2009), CDFW (2010) and Holland (1986), delineated on an aerial photograph, and then digitized into ArcGIS. The ArcGIS application was used to compute the area of each plant community in acres.

2.5 PLANTS

Common plant species observed during the field survey were identified by visual characteristics and morphology in the field and recorded in a field notebook. Unusual and less familiar plants were photographed in the field and identified in the laboratory using taxonomic guides. Taxonomic nomenclature used in this study follows the 2012 Jepson Manual (Hickman 2012). In this report, scientific names are provided immediately following common names of plant species (first reference only).

2.6 WILDLIFE

Wildlife species detected during field surveys by sight, calls, tracks, scat, or other sign were recorded during surveys in a field notebook. Field guides were used to assist with identification of wildlife species during the survey included The Sibley Field Guide to the Birds of Western North America (Sibley 2003), A Field

Guide to Western Reptiles and Amphibians (Stebbins 2003), and A Field Guide to Mammals of North America (Reid 2006). Although common names of wildlife species are fairly well standardized, scientific names are provided immediately following common names in this report (first reference only).

2.7 JURISDICTIONAL DRAINAGES AND WETLANDS

Aerial photography was reviewed prior to conducting a field investigation in order to locate and inspect any potential natural drainage features, ponded areas, or water bodies that may fall under the jurisdiction of the Corps, Regional Board, and/or CDFW. In general, surface drainage features indicated as blue-line streams on USGS maps that are observed or expected to exhibit evidence of flow are considered potential riparian/riverine habitat and are also subject to state and federal regulatory jurisdiction. In addition, ELMT reviewed jurisdictional waters information through examining historical aerial photographs to gain an understanding of the impact of land-use on natural drainage patterns in the area. The USFWS NWI and Environmental Protection Agency (EPA) Water Program "My Waters" data layers were also reviewed to determine whether any hydrologic features and wetland areas have been documented on or within the vicinity of the project site.

Section 3 Existing Conditions

3.1 LOCAL CLIMATE

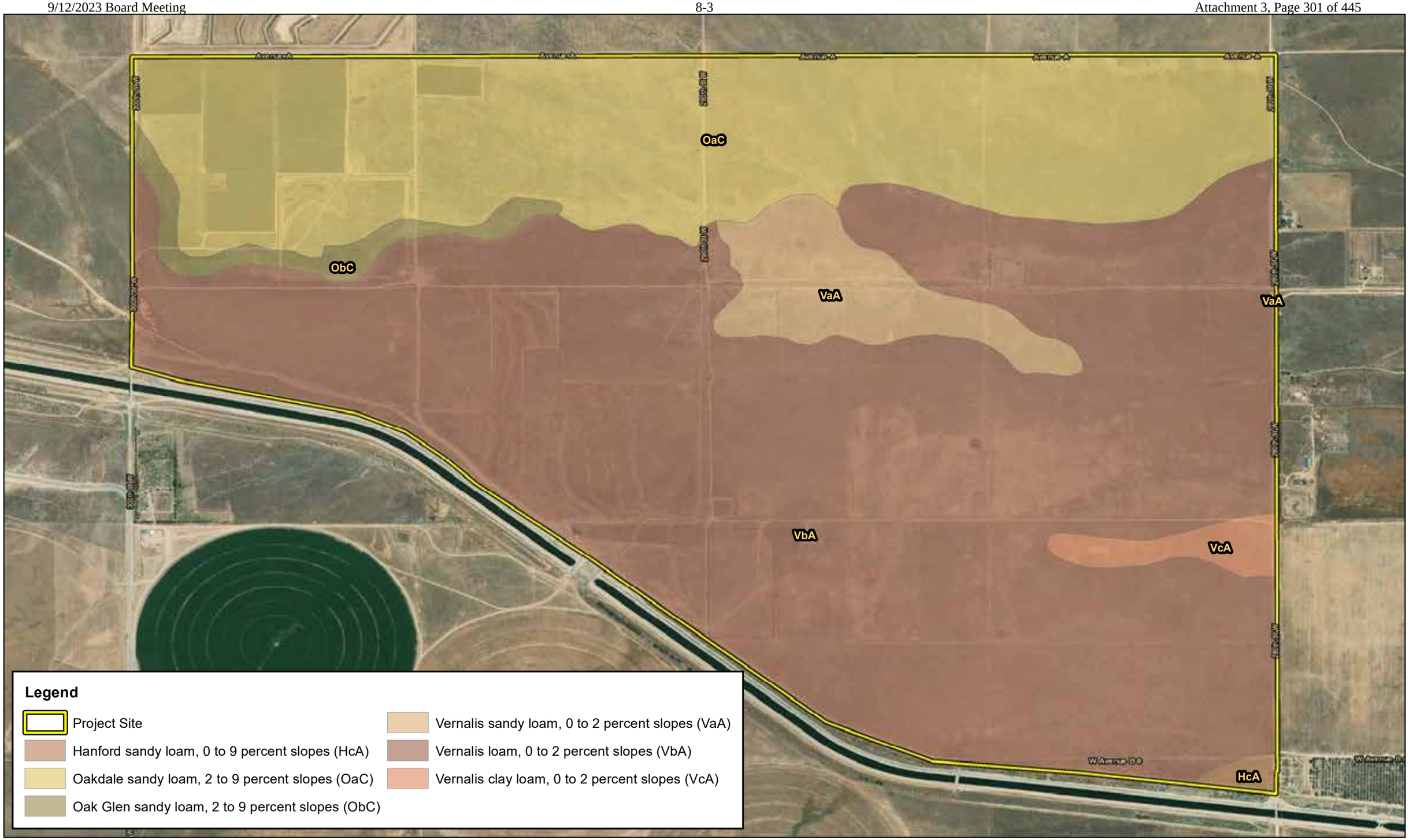
The Mojave Desert is found at elevations of 2,000 to 5,000 feet above mean sea level and is characterized by cool winter temperatures and warm summer temperatures, with its rainfall occurring almost entirely in the winter. Climatological data obtained for the City of Lancaster indicates the annual precipitation averages 7.38 inches per year. Almost all of the precipitation in the form of rain occurs in the months between October and April, with hardly any occurring between the months of May and September. The wettest month is February, with a monthly average total precipitation of 1.78 inches. The average minimum and maximum temperatures for the region are 47 and 77 degrees Fahrenheit (°F) respectively with December (monthly average 30° F) being the coldest month and July and August being the hottest (monthly average 98° F). Temperatures during the site visit were in the low-60s to mid-70s (° F).

3.2 TOPOGRAPHY AND SOILS

On-site surface elevation ranges from approximately 2,930 to 3,040 feet above mean sea level. The highest elevation occurs in the northwest corner, with the rest of the site generally sloping from west to east. According to the NRCS Custom Soil Resource Report, the project site is underlain by the following soil units: Hanford sandy loam (0 to 2 percent slopes), Oakdale sandy loam (2 to 9 percent slopes), Oak Glen sandy loam (0 to 9 percent slopes), Vernalis sandy loam (0 to 2 percent slopes), Vernalis loam (0 to 2 percent slopes), and Vernalis clay loam (0 to 2 percent slopes). (Exhibit 4, *Soils*). Soils supported by the project site have been compacted and disturbed by decades of agricultural land uses and ranching and grazing activities.

3.3 SURROUNDING LAND USES

The project site is located in a primarily undeveloped area in unincorporated Los Angeles County. The site is surrounded immediately by undeveloped, land to the west, north, and east, and the California Aqueduct to the south with undeveloped land beyond. Immediate land uses in the vicinity of the site include agricultural activities in all directions, water detention basins immediately north of the northwest portion of the site, and residential parcels scattered throughout the area. A network of dirt trails and access roads traverse the site and surrounding area, both north and south of the Aqueduct.



ANTELOPE VALLEY-EAST KERN WATER AGENCY'S HIGH DESERT WATER BANK PROJECT
BIOLOGICAL RESOURCES REPORT

ELMT

0 625 1,250 2,500 Feet

Source: ESRI Aerial Imagery, Soil Survey Geographic Database, World Transportation, Los Angeles County

Soils

Section 4 Discussion

4.1 SITE CONDITIONS

The project site encompasses an area that historically supported agricultural and grazing activities. The site is primarily composed of undeveloped, vacant land with varying degrees of disturbance, along with developed land associated with historic and recent land uses. Site conditions appear to be unchanged since the time of the 2017 evaluation.

4.2 VEGETATION

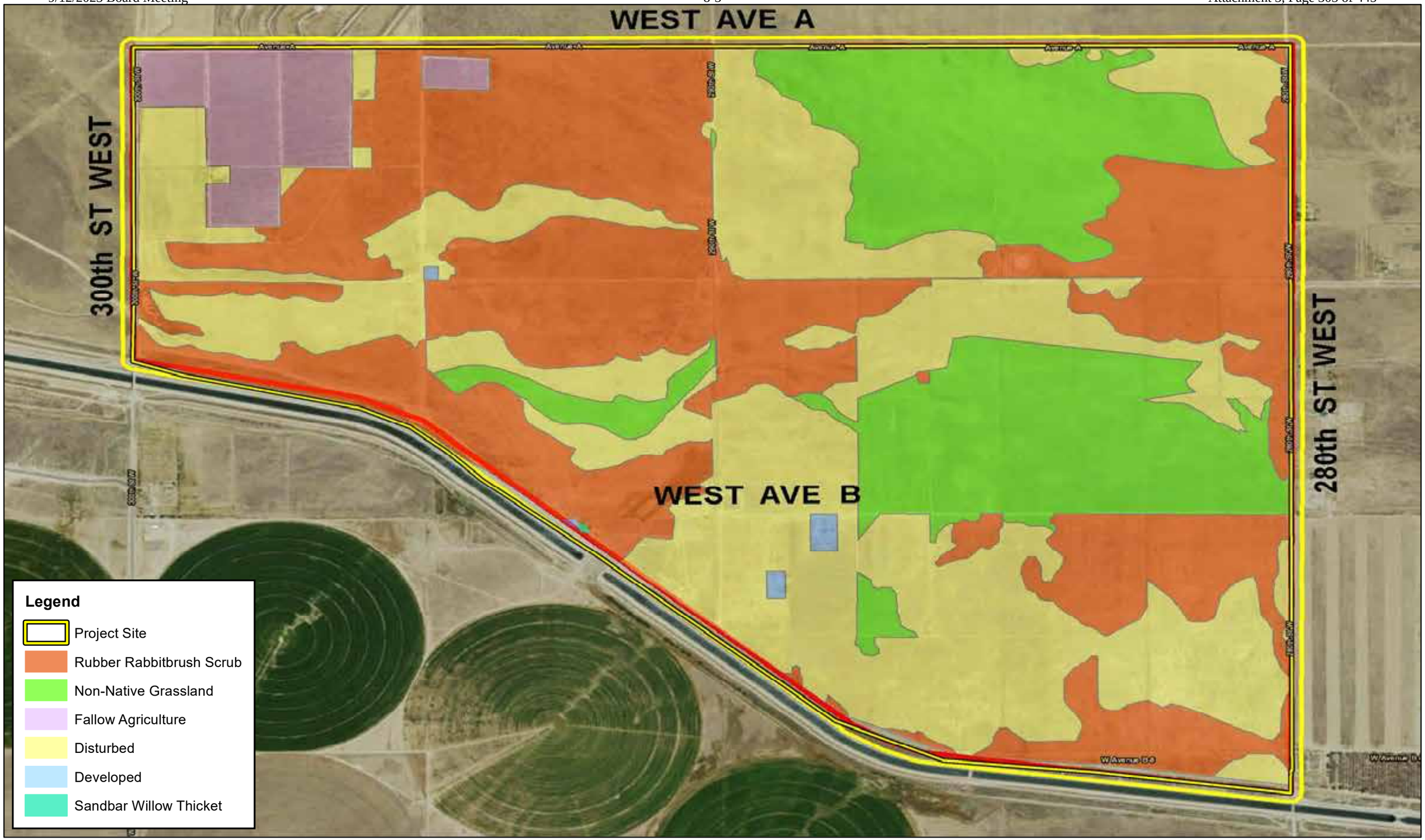
Three (3) native vegetation communities and two (2) anthropogenic land cover types were documented in AECOM's 2017 report: fiddleneck fields, non-native annual grassland, rubber rabbitbrush scrub, fallow agriculture, and developed. During the 2021 field investigation four (4) plant communities were observed within the boundary of the project site: rubber rabbitbrush scrub, sandbar willow thicket, fallow agriculture, and non-native grassland (Exhibit 5, *Vegetation*). In addition, two (2) land cover types that would be classified as disturbed and developed were observed. The fiddleneck fields documented onsite in the 2017 report were renamed as disturbed areas in this report since large stands of fiddleneck were not observed. Additionally, a new plant community was identified in this report, sandbar willow thicket, that was not identified in the 2017 report. The vegetation communities and land cover types are described in further detail below.

4.3.1 Rubber Rabbitbrush Scrub

The rubber rabbitbrush scrub plant community occurs commonly throughout the project site where the prevailing shrubby perennials native to the area have revegetated naturally. This plant community corresponds with the rubber rabbitbrush scrub habitat documented in the 2017 report. This plant community is dominated by rubber rabbitbrush (*Ericameria nauseosa*) in varying densities and supports a sparse herbaceous later. Common plant species observed in this plant community include bladderpod (*Peritoma arboera*), saltbushes (*Atriplex canescens* & *A. polycarpa*), fiddleneck (*Amsinckia* spp.), annual sunflower (*Helianthus annuus*), heliotrope (*Heliotropium curassavicum*), jimsonweed (*Datura wrightii*), California mustard (*Caulanthus lasiophyllus*), Mediterranean mustard (*Hirschfeldia incana*), dove weed (*Croton setiger*), slender buckwheat (*Eriogonum* sp.), and non-native grasses (*Bromus* spp. & *Hordeum murinum*).

4.3.2 Fallow Agriculture

The northwest corner of the project site supports fallow agriculture, remnant from historic land uses. This plant community corresponds with the fallow agriculture habitat documented in the 2017 report. This plant community is composed almost uniformly of dead and mostly dead peach trees (*Prunus persica*), with an often-dense herbaceous layer composed primarily of weedy/early successional species such as Mediterranean mustard, fiddleneck, filaree (*Erodium* spp.), and non-native grasses.



ANTELOPE VALLEY-EAST KERN WATER AGENCY'S HIGH DESERT WATER BANK PROJECT
BIOLOGICAL RESOURCES REPORT

Vegetation

Source: ESRI Aerial Imagery, AECOM 2017 Biological Technical Report, World Transportation, Los Angeles County

4.3.3 Non-Native Annual Grassland

A non-native grassland plant community is found throughout the project site. This plant community corresponds with the non-native annual grassland habitat documented in the 2017 report. This plant community often occurs where agricultural activities or other anthropogenic disturbances are no longer present, and land is revegetated and becomes dominated by non-native grasses. The non-native grassland plant community supported by the project site is dominated by brome species such as bromes and mouse barley. Other common plant species that occur in Mediterranean mustard, western ragweed (*Ambrosia psilostachya*), fiddleneck, dove weed, Russian thistle (*Salsola tragus*), filaree, rubber rabbitbrush, four o'clock (*Mirabilis multiflora* var. *glandulosa* & *A. m. pubescens*), and beard grass.

4.3.4 Disturbed

The majority of the project site supports disturbed land as a result of decades of agricultural activities followed by land abandonment. This land cover type corresponds with the fiddleneck fields habitat documented in the 2017 report. Large stands of fiddleneck were not observed during the 2021. In addition, furrows and low berms have been constructed throughout the site in recent years. Further, an array of dirt roads and trails exists within the site as a result of regular and off-highway vehicle use throughout the area. Disturbed areas supported by the project site vary in vegetation density from barren to dense monoculture. Common plant species observed in the disturbed portions of the site include tumbleweed (*Amaranthus albus*), Russian thistle, Mediterranean mustard, non-native grasses, filaree, Canada horseweed, wire lettuce (*Stephanomeria pauciflora*), horse nettle (*Solanum eleagnifolium*), coyote melon (*Cucurbita palmata*), and fiddleneck.

4.3.5 Developed

Developed areas generally encompass all buildings/structures, parks, and paved, impervious surfaces. Within the boundaries of the project site, developed areas include existing residential structures and buildings, pump stations and other pipeline infrastructure, ornamental landscaping, paved roads, and unpaved roads used frequently enough to ensure substantial soil compaction. Developed areas are largely devoid of vegetation or support only weedy/early successional species adapted to growing in heavily compacted soils. This land cover type corresponds with the disturbed areas documented in the 2017 report.

4.3.6 Sandbar Willow Thicket

The sandbar willow thicket plant community is found only within and near a pump discharge basin near the middle of the southern boundary of the project site. This plant community was not documented in the 2017 report, but was mentioned in the water features section of the 2017 report. This area is fed constantly by water from the adjacent pump station and also supports a small pond feature as a result of overflow within the pump station. This plant community is dominated by sandbar willow (*Salix exigua*) that occurs in high enough density as to form a thicket. Additional plant species observed in the sandbar willow thicket include Fremont cottonwood (*Populus fremontii*), cattail (*Typha* sp.), toad rush (*Juncus bufonius*), salt cedar (*Tamarix ramossisima*), beard grass (*Polypogon* sp.), sprangletop (*Leptochloa fusca*), and water speedwell (*Veronica anagallis-aquatica*).

4.3 GENERAL WILDLIFE

Plant communities provide foraging habitat, nesting and denning sites, and shelter from adverse weather or predation. This section provides a discussion of those wildlife species that were observed during the field survey or that are expected to occur within the project site. The discussion is to be used as a general reference and is limited by the season, time of day, and weather condition in which the field survey was conducted. Wildlife detections were based on calls, songs, scat, tracks, burrows, and direct observation.

4.4.1 Fish

The only hydrogeomorphic feature (e.g., perennial creeks, ponds, lakes, reservoirs) supported by the project site that has marginal potential to support fish species is the pond feature that occurs near the middle of the southern boundary. No fish were observed within the pond feature. Since the only upstream flows to the feature must first pass through the pump station, no naturally-occurring fish species are expected to occur. The only fish species that may be expected to occur would be mosquitofish (*Gambusia affinis*), a small non-native species that is commonly introduced to aquatic systems as a vector control measure. No special-status fish species are expected to occur within the pond feature.

4.4.2 Amphibians

The only hydrogeomorphic feature supported by the project site that is capable of providing suitable habitat for amphibian species is the pond feature that occurs near the middle of the southern boundary. No amphibians were observed within the pond feature. Since the only direct upstream flows to the feature must first pass through the pump station, no amphibians are expected to be introduced via the pump station. However, amphibian species adapted to extremely disturbed conditions that are capable of migrating via flows during storm events may be able to migrate from nearby areas. Common amphibian species that have the potential to occur on-site include western toad (*Anaxyrus boreas*) and chorus frog (*Pseudacris hypochondriaca*). No special-status amphibian species are expected to occur within the pond feature.

4.4.3 Reptiles

The plant communities supported by the project site provide suitable foraging and cover habitat for a variety of reptilian species adapted to conditions within the Mojave Desert. No reptilian species were observed during the field investigation. Common reptilian species that may be expected to occur include side-blotched lizard (*Uta stansburiana elegans*) and Great Basin gopher snake (*Pituophis catenifer deserticola*), desert horned lizard (*Phrynosoma platyrhinos calidiarum*), great basin whiptail (*Aspidoscelis tigris tigris*), southwestern speckled rattlesnake (*Crotalus mitchellii pyrrhus*), western zebra-tailed lizard (*Callisaurus draconoides rhodostictus*), and northern Mohave rattlesnake (*Crotalus scutulatus scutulatus*).

4.4.4 Birds

The plant communities supported by the project site provide suitable foraging and nesting habitat for a variety of resident and migrant bird species adapted to conditions within the Mojave Desert. Avian species detected during the survey included common raven (*Corvus corax*), mourning dove (*Zenaida macroura*), horned lark (*Eremophila alpestris actia*), American kestrel (*Falco sparverius*), western meadowlark

(*Sturnella neglecta*), barn swallow (*Hirundo rustica*), loggerhead shrike (*Lanius ludovicianus*), and black-crowned night-heron (*Nycticorax nycticorax*).

4.4.5 Mammals

The plant communities surrounding and supported by the project site provide limited foraging and denning habitat for a variety of mammalian species adapted to conditions within the Mojave Desert. Most mammal species are nocturnal and are difficult to observe during a diurnal field visit. Mammalian species observed or detected during the field investigation were coyote (*Canis latrans*), black-tailed jackrabbit (*Lepus californicus*) and California ground squirrel (*Otospermophilus beecheyi*). Common mammalian species that could be expected to occur on-site include white-tailed antelope ground squirrel (*Ammospermophilus leucurus*), and desert cottontail (*Sylvilagus audubonii*). No bat species are expected to occur due to a lack of suitable roosting habitat (i.e., trees, crevices, abandoned structures) within and surrounding the project site.

4.4 NESTING BIRDS

No active nests or birds exhibiting nesting behaviors were observed during the field survey, which was conducted during the nesting season. The plant communities supported on-site provide suitable foraging and nesting habitat for year-round and seasonal avian residents, as well as migrating songbirds that have adapted to conditions in the Mojave Desert. In addition, the open areas on-site also provides nesting opportunities for ground-nesting species such as killdeer (*Charadrius vociferus*). No raptors are expected to nest on-site due to lack of suitable nesting opportunities.

Nesting birds are protected pursuant to the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code (Sections 3503, 3503.5, 3511, and 3513 prohibit the take, possession, or destruction of birds, their nests or eggs). If construction occurs between February 1st and August 31st, a pre-construction clearance survey for nesting birds should be conducted within three (3) days of the start of any vegetation removal or ground disturbing activities to ensure that no nesting birds will be disturbed during construction.

4.5 WILDLIFE CORRIDORS AND LINKAGES

Habitat linkages provide links between larger undeveloped habitat areas that are separated by development. Wildlife corridors are similar to linkages but provide specific opportunities for animals to disperse or migrate between areas. A corridor can be defined as a linear landscape feature of sufficient width to allow animal movement between two comparatively undisturbed habitat fragments. Adequate cover is essential for a corridor to function as a wildlife movement area. It is possible for a habitat corridor to be adequate for one species yet inadequate for others. Wildlife corridors are significant features for dispersal, seasonal migration, breeding, and foraging. Additionally, open space can provide a buffer against both human disturbance and natural fluctuations in resources.

According to the Los Angeles County Department of Regional Planning, the project site does not occur within a Significant Ecological Area (SEA) or CDFW designated Essential Connectivity Area (ECA). As such, the site does not occur within any designated open space and has not been identified as a wildlife

corridor or linkage. Therefore, no impacts to areas deemed essential for regional habitat connectivity and wildlife migration will occur due to project-related activities.

As documented in the 2017 report, and verified during the 2021 field investigation, the project site, consists of wide, relatively flat, unobstructed lands, that has the provide to support transitory and dispersal habitat for wildlife species moving between adjacent habitats. Habitat in the vicinity of the project site on the north side of the California Aqueduct is largely continuous and consists of habitats similar to those found on the project site. Only the California Aqueduct acts as a significant barrier to wildlife migration in the vicinity of the project site, partially obstructing movement between habitats north and south of the canal. However, there are canal crossing that allow for north to south wildlife movement, including those at 280th Street W and 300th Street W, and one at the approximate mid-point along the southern boundary of the project site. The proposed project will not impact these crossings. The construction of raised, native earthen berms over approximately 1,200 acres of the project site will have the potential to reduce the quality of the overall transitory and dispersal habitat, but will still allow movements opportunities across the project site and larger region.

Flooding of the basins will temporarily obstruct dispersal and overland movement opportunities in those localized areas on the project site, but will also create watering holes for wildlife to use. However, adjacent suitable properties will remain viable for transitory movements and overland dispersal. The reduction of dispersal habitat quality and intermittent long-term temporary removal of overland dispersal habitat is not expected to significantly impact wildlife movement in the region. Project impacts to wildlife movement and habitat connectivity are expected to be less than significant.

4.6 STATE AND FEDERAL JURISDICTIONAL AREAS

There are three key agencies that regulate activities within inland streams, wetlands, and riparian areas in California. The Corps Regulatory Branch regulates discharge of dredge and/or fill materials into “waters of the United States” pursuant to Section 404 of the Federal Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. Of the State agencies, the Regional Board regulates discharges into surface waters pursuant to Section 401 of the CWA and the California Porter-Cologne Water Quality Control Act and the CDFW regulates alterations to streambed and associated plant communities pursuant to Section 1602 of the California Fish and Game Code.

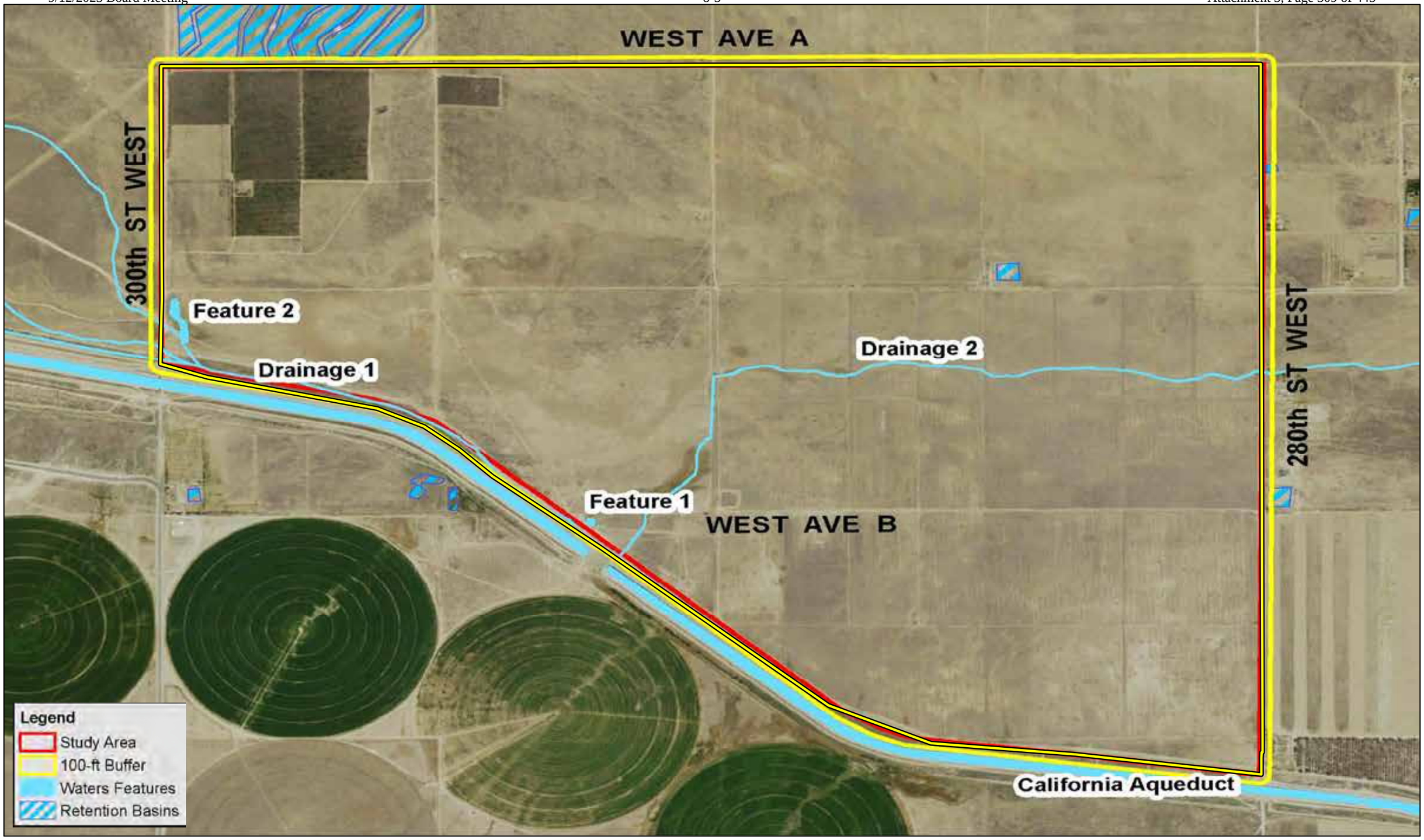
The USFWS NWI and the USGS National Hydrography Dataset were reviewed to determine if any blueline streams or riverine resources have been documented within or immediate surrounding the project site. Based on this review, three (3) riverine resources, four (4) freshwater ponds, and one (1) freshwater emergent wetland were identified within the survey area. No changes to these features were noted between the 2017 and 2021 surveys.

Of the four freshwater ponds documented by the NWI, two of these features are associated with man-made retention basins that were determined to have been destroyed prior to 2004 based on a review of historic aerial imagery; these features within the Project site that were no longer extant. The third freshwater pond documented on the NWI on the southwest corner of the project site was no longer extant. The fourth freshwater pond is located in the middle of the southern boundary of the project site and is associated near a pump discharge basin. This freshwater ponded area supports a sandbar will thicket that is fed constantly

by water from the adjacent pump station and also supports a small pond feature as a result of overflow within the pump station. The NWI also documents a freshwater emergent wetland in the middle of the southern boundary of the project site that was no longer extant; no emergent or hydrophytic vegetation and no topographic depression were observed.

Four features, documented in the 2017 report continue to be observed onsite (refer to Exhibit 6, *Drainage Features*):

- Feature 1: A single, raised retention basin with approximately 5-foot-tall dirt embankments is located in the middle of the southern boundary of the project site, north of the aqueduct crossing. This feature is relatively small, encompassing approximately 0.1 acres, and contained surface waters approximately 8-10 inches in depth during the field survey. The feature is fed by a buried discharge pipe at the northwest corner of the basin, which appears to originate at the pump station immediately west of the feature. Substrate and banks were of native soils. This feature supports the narrowleaf willow thicket plant community. Since this feature is man-made, does not possess a surface hydrologic connection to downstream waters, and was created as a retention basin in the uplands, it will likely not be considered jurisdictional by the Corps, Regional Board, and/or CDFW.
- Feature 2: Documented as a potential seasonal wetland feature on the southwest corner of the project site in the 2017 report, this feature was further degraded during the 2021 field investigation with little to no evidence of water ponding. This feature will likely be considered jurisdictional by the Corps, Regional Board, and/or CDFW.
- Drainage 1: An unnamed drainage feature conveys flows onto the southwest corner through a set of culverts that convey flows under 300th Street West. No water was present during the 2017 or 2021 field surveys. Two pairs of culverts appear to contribute flows; the southern pair is approximately 12 inches in diameter each and show direct hydrological linkage to the channel. The norther set of culverts are approximately 36 inches in diameter, and open into a deep plunge pool that may overflow into the channel during high flow events. From 300th Street W, flows are conveyed southwest roughly parallel to the unnamed access road north of the California Aqueduct. Flows cross over one existing road and disperse into upland habitat at the downstream end of the drainage in the middle of the southern boundary of the project site with no apparent connection to other features. Drainage 1 is approximately 3,880 feet, with an average width of 2 to 4 feet. This feature will likely be considered jurisdictional by the Corps, Regional Board, and/or CDFW.
- Drainage 2: A second unnamed drainage feature, referred to as Oso Canyon Floodway on the revised engineering plans, was previously documented as forming in the middle of the southern boundary of the project site from overland flows and roadway run-off near the crossing of the California Aqueduct. No surface water was present in the channel during the field surveys. The channel loses its defined banks as it continues northeast, becoming wide, poorly defined, and well-vegetated with upland species (i.e., overland sheet flow). The drainage is modified in several places, including areas where the channel has been filled in to build roadway crossings and flows pour over the road and enter the channel on the other side. At one point, flows appear to travel along an existing dirt roadway for approximately 920 feet, before crossing and continuing east as overland sheet flow across the grasslands. At the downstream end, flows from the grassland collect into a deep, wide, incised channel for the last 425 feet before crossing 280th Street W and continuing east



ELMT

0 625 1,250 2,500 Feet

Source: ESRI Aerial Imagery, AECOM 2017 Biological Technical Report, World Transportation, Los Angeles County

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BIOLOGICAL RESOURCES REPORT

Drainage Features

Exhibit 1345

- out of the project site, eventually connecting with an unnamed ephemeral drainage that conveys flows eastward before dispersing in the uplands. Drainage 2 is approximately 7,880 feet long with an average width between 8 and 20 feet. This feature will likely be considered jurisdictional by the Corps, Regional Board, and/or CDFW.

4.7 SPECIAL-STATUS BIOLOGICAL RESOURCES

The CNDDB Rarefind 5, CNDDB Quickview Tool in BIOS and the CNPS Electronic Inventory of Rare and Endangered Vascular Plants of California were queried for reported locations of special-status plant and wildlife species as well as special-status natural plant communities in the La Liebre Ranch and Neenach School USGS 7.5-minute quadrangles. These two quadrangles were queried due to the proximity of the project site to quadrangle boundaries, on-site conditions, and regional topography. The habitat assessment evaluated the conditions of the habitat(s) within the boundaries of the project site to determine if the existing plant communities, at the time of the survey, have the potential to provide suitable habitat(s) for special-status plant and wildlife species.

The updated literature search identified ten (10) special-status plant species, fourteen (14) special-status wildlife species, and four (4) special-status plant communities as having the potential to occur within the La Liebre Ranch and Neenach School quadrangles. Special-status plant and wildlife species were evaluated for their potential to occur within the project boundaries based on habitat requirements, availability and quality of suitable habitat, and known distributions. Species determined to have the potential to occur within the general vicinity are presented in *Table C-1: Potentially Occurring Special-Status Biological Resources*, provided in Appendix C. Refer to Table C-1 for a determination regarding the potential occurrence of special-status plant and wildlife species within the project site.

4.8.1 Special-Status Plants

According to the updated review of the CNDDB and CNPS, ten (10) special-status plant species have been recorded in La Liebre Ranch and Neenach School quadrangles (refer to Appendix C). No special-status plant species were observed on-site during the field investigation. The project site has been sufficiently degraded by decades of agricultural activities and no longer supports naturally-occurring plant communities and unmixed soils required by special-status plant species. Based on habitat requirements for the identified special-status species, and known distributions, it was determined that the plant communities found on-site do not have the potential to support any of the special-status species known to occur within the vicinity of the project site.

The 2017 report determined that three special-status plant species [round-leaved filaree (*California macrophylla*), Tracy's eriastrum (*Eriastrum tracyi*), and Piute Mountains navarretia (*Navarretia setiloba*)] had a low potential to occur onsite due to soil types within the project site and the distance from known occurrences. These three species are no longer identified in the updated literature review as having the potential to occur within the La Liebre Ranch and Neenach School quadrangles. As previously noted, due to decades of agricultural activities, no special-status plant species are expected to occur onsite and are presumed absent.

4.8.2 Special-Status Wildlife

According to the updated review of the CNDDB, fourteen (14) special-status wildlife species have been reported in the La Liebre Ranch and Neenach School quadrangles (refer to Appendix C). The only special-status wildlife species observed onsite during the field surveys was California horned lark (*Eremophila alpestris actia*) and loggerhead shrike (*Lanius ludovicianus*). Based on habitat requirements for specific species and the availability and quality of on-site and adjacent habitats, it was determined that the proposed project site has a high potential to support burrowing owl (*Athene cunicularia*) and ferruginous hawk (*Buteo regalis*); a moderate potential to support tricolored blackbird (*Agelaius tricolor*); and a low potential to support golden eagle (*Aquila chrysaetos*), coastal whiptail (*Aspidoscelis tigris stejnegeri*), coast horned lizard (*Phrynosoma blainvillii*), white-faced ibis (*Plegadis chihi*), American badger (*Taxidea taxus*), and yellow-headed blackbird (*Xanthocephalus xanthocephalus*). Additionally, the Crotch bumble bee (*Bombus crotchii*), Tehachapi pocket mouse (*Perognathus alticolus inexpectatus*), desert kit fox (*Vulpes macrotis*), and Swainson's hawk (*Buteo swainsoni*), desert tortoise (*Gopherus agassizii*) listed in the 2017 biological technical report were determined to have a low potential to occur onsite or are presumed absent. It was further determined that the project site does not have the potential to support any of the other special-status wildlife species known to occur in the vicinity of the project site.

Based on the results of the updated literature review and field investigation, the following describes the potential for the special-species listed in the 2017 biological technical report to occur onsite.

Crotch Bumble Bee

No bumble bee species were observed during the 2017 or 2021 field surveys. However, as noted in the 2017 report, the project site continues to have a low potential to provide suitable habitat for this species. Suitable food plants including phaecelia (*Phaecelia* sp.) and lupines (*Lupinus* sp.) are present at low to moderate densities. Other wildflowers occur at higher densities, including fiddlenecks, but it is unknown if Crotch bumble bee will feed on these species.

Tricolored Blackbird

The project site does not support suitable nesting habitat for tricolored blackbirds since aquatic habitats are very limited. Even though the sandbar willow thicket, associated with the retention basin, supports willows and emergent riparian vegetation, it does not support large stands of dense of cattails or bulrushes needed to provide suitable nesting opportunities. However, the project site has the potential to provide suitable foraging habitat for tricolored blackbirds in the grasslands. Since tricolored blackbirds have been observed in the area, it was determined that this species has a moderate potential to occur onsite.

Burrowing Owl

No burrowing owls were observed within the project site during the 2017 or 2021 field surveys. The project site is unvegetated and/or vegetated with a variety of low-growing plant species that allow for line-of-sight observation favored by burrowing owls and the site supports suitable burrows (>4 inches in diameter) capable of providing roosting and nesting opportunities.

Tehachapi Pocket Mouse

No Tehachapi pocket mice were observed during the 2017 or 2021 field surveys. Potentially suitable habitat is present within the project site and small mammal burrowing activity was common. However, the project site occurs just below the documented elevation range for this species is not expected to occur onsite.

American Badger

No American badgers or signs of American badger, including burrows or evidence of predation attempts, were observed during the field surveys. The project site was determined to support low quality habitat for this species. Suitable prey species including kangaroo rats, rabbits, and California ground squirrels, as well as nesting birds, were observed at sufficient densities to support American badgers.

Desert Kit Fox

No desert kit fox or sign of desert kit fox were observed during field surveys. However, the project site does occur within the range for this species and provides low quality habitat. Suitable prey species, including kangaroo rats, desert cottontail, and black-tailed jackrabbits, were observed in sufficient densities to support desert kit fox.

Swainson's Hawk

There are no Swainson's hawk records within the Study Area 7.5-minute quadrangle or any adjacent 7.5-minute quadrangle, or within a 15-mile radius of the Study Area (CDFW 2017a). No Swainson's hawks or potential Swainson's hawk nests were observed within the project site during the 2017 or 2021 field surveys. However, the project site occurs within the range of Swainson's hawk, at the western edge of this species' extent within the Antelope Valley. Potential nesting habitat is extremely limited within the Study Area, although utility poles and snags and a few larger trees do occur. Potentially suitable foraging habitat that supports suitable prey species including burrowing mammals is present in the open shrubland and grassland habitats that are common throughout the Study Area. Although Swainson's hawks were not observed, this species does was determine to have a low to moderate potential to utilize the project site for foraging opportunities.

Desert Tortoise

No desert tortoises, or their sign, including scat, tracks, burrows, egg shell fragments, pallets, courtship rings, etc., were observed during the 2017 or 2021 field surveys. Given the distance from any documented occurrences, the absence of observed sign during surveys, and the fact that the project site occurs outside the USFWS-accepted current range and outside the bounds of suitable habitat as modelled by Nussear *et al.*, this species is not expected to occur within the project site.

4.8 CRITICAL HABITAT

Under the federal Endangered Species Act, "Critical Habitat" is designated at the time of listing of a species or within one year of listing. Critical Habitat refers to specific areas within the geographical range of a species at the time it is listed that include the physical or biological features that are essential to the survival and eventual recovery of that species. Maintenance of these physical and biological features requires special management considerations or protection, regardless of whether individuals or the species are present or

not. All federal agencies are required to consult with the United States Fish and Wildlife Service (USFWS) regarding activities they authorize, fund, or permit which may affect a federally listed species or its designated Critical Habitat. The purpose of the consultation is to ensure that projects will not jeopardize the continued existence of the listed species or adversely modify or destroy its designated Critical Habitat. The designation of Critical Habitat does not affect private landowners, unless a project they are proposing is on federal lands, uses federal funds, or requires federal authorization or permits (e.g., funding from the Federal Highways Administration or a CWA Permit from the Corps). If a there is a federal nexus, then the federal agency that is responsible for providing the funding or permit would consult with the USFWS.

The project site is not located within federally designated Critical Habitat. The nearest Critical Habitat designation is located approximately 4 miles west of the project site for California condor (*Gymnogyps californianus*) (Exhibit 7, *Critical Habitat*). Therefore, no impacts to federally designated Critical Habitat will occur from implementation of the proposed project.

4.9 HABITAT MANAGEMENT LANDS

The proposed project includes onsite habitat management lands encompassing approximately 322 acres of the 1,500-acre site. Habitat management lands will include undisturbed areas of native and naturalized habitats, as well as areas encompassing onsite waters features, and will provide foraging, sheltering, transitory, and breeding habitat for native wildlife and plant species.

The previous project design identified the 322 acres of conservation lands along the southern boundary of the project site, and on the southeast and northwest corners of the project site. Additionally, the previous design covered Drainage 2 in the middle of the project site. The new project design identifies the lands as primarily occurring along the southern boundary of the project site, paralleling the California Aqueduct, a larger swath in the middle of the project site encompassing Drainage 2, and a smaller area on the northwest corner of the project site. Refer to Appendix A for the location of the previous and current conservation lands.

Even though the location of the 322 acres of conservation lands was redesigned, the two larger blocks of habitat along the southern boundary (adjacent to the California Aqueduct) and in the middle of the project site (encompassing Drainage 2) provide higher quality habitat for wildlife movement and foraging opportunities. Instead of the conservation lands begin confined to the southern boundary and northwest and southeast corners. The larger blocks of habitat, along with the constructed basins, provide higher quality local wildlife movement opportunities across the site, while providing potential watering holes.

ANTELOPE VALLEY-EAST KERN WATER AGENCY'S HIGH DESERT WATER BANK PROJECT
BIOLOGICAL RESOURCES REPORT

ELMT CONSULTING

0 1.25 2.5 5 Miles

Source: ESRI Aerial Imagery, USFWS Critical Habitat, Los Angeles County

Critical Habitat

Exhibit 1350

Section 5 Conclusion and Recommendations

The revised project design will allow recharge to occur in wet years over approximately eight months within 890 acres of fixed engineered basins, as opposed to only 400 acres for 12 months in wet years in the previous design. However, overall, while the original design would only utilize 400 acres annually for recharge, the design including rotating the 400 acre recharge area throughout the approximately 1,200 acre site, similar to agricultural farming thus disturbing all of the 1,200 acres over time. With the revised design being fixed basins of approximately 890 acres, and recharge occurring over a shorter time frame, wildlife will have a fixed, consistent landscape in which to forage and nest as well as fixed areas for water sources. Overall, this would provide a benefit of stability to the on-site wildlife.

Further, the re-location of the 322 acres designated for habitat management (conservation lands) was also evaluated. The former location provided larger blocks of habitat in the northern and southern portions of the property with narrow pathways of refuge and movement in Drainage 1 and Drainage 2. The revised design essentially eliminates the southern block and reduces the northern block but provides a wider corridor of preservation in Drainage 2 as well as a wider strip along the aqueduct to facilitate wildlife movement between the northern and southern portions of the site, as well as good habitat in the central drainage area. The larger blocks of habitat, along with the constructed basins, provide higher quality local wildlife movement opportunities across the site, while providing potential watering holes.

Based on the result of the updated literature review and field investigation, and revised project design, the conclusions and recommendations provided in AECOM's 2017 Biological Technical Report remain valid. Impacts to special-status plant and wildlife species will be less than significant with incorporation of the mitigation measures (BIO-1 thru 12) detailed in the 2017 report and summarized below. Appendix D, *Mitigation Monitoring and Reporting Program*, provides the detailed list of the biological mitigation measures.

Special-Status Plant Species

No special-status plant species were observed during the field investigation. Based on habitat requirements for the identified special-status species, known species distributions, and the quality and availability of habitats present, it was determined that the project site does not have the potential to support any of the special-status plant species known to occur in the vicinity of the site. The project site spent the majority of the last century supporting agricultural and grazing activities, and natural plant communities are no longer present.

Even though no special-status plant species are expected to occur onsite dur to previous anthropogenic disturbances, Mitigation Measure BIO-7 (refer to Appendix D) from the 2017 biological report will be implemented to ensure that no impacts to special-status plant species will occur prior to project implementation.

Special-Status Wildlife Species

In order to ensure impacts to special-status wildlife species do not occur from implementation of the project, Mitigation Measures BIO-1, -2, -3, -4, -5, -8, and -8 (refer to Appendix D) from the 2017 biological report

will be implemented to ensure that impacts to jurisdictional drainage features, if any occur, are quantified and permitted through the appropriate regulatory agencies.

Jurisdictional Drainages, Riparian Habitat, and Special-Status Natural Communities

As documented in the 2017 biological report, and verified during the 2021 field investigation, several ephemeral drainage features, occur within the project site. The proposed Project includes habitat management lands encompassing the drainage features. Inundation containment berms will be constructed around drainages in order to avoid intrusion on jurisdictional boundaries and maintain adequate areas for flows. The freshwater emergent wetland (Feature 1) occurs outside the disturbance footprint of the proposed Project and is associated with existing infrastructure and will not be disturbed. No impacts to waters features are anticipated. If the proposed project will impact any of the features onsite, or if berms will be pushed to the banks of these features, further review will be required, and regulatory approvals will need to be obtained prior to project implementation.

Further, no sensitive habitats were identified within the project site. Thus, no sensitive natural communities will be impacted from project implementation.

Mitigation Measures BIO-6 and BIO-10 (refer to Appendix D) from the 2017 biological report will be implemented to ensure that impacts to jurisdictional drainage features, if any occur, are quantified, and permitted through the appropriate regulatory agencies (i.e., Corps, Regional Board, and/or CDFW).

Wildlife Corridors

Implementation of the proposed project will have temporary impacts to local wildlife dispersal and overland movement opportunities but will not have a significant impact regional habitat connectivity or wildlife migration.

Mitigation Measure BIO-11 (refer to Appendix D) from the 2017 biological report will be implemented to ensure that the onsite conservation lands continue to provide foraging, nesting, and denning opportunities for special-status and general wildlife species.

Local, Regional, and State Plans

The project site is not located within an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state Habitat Conservation Plan. Therefore, impacts to any local, regional, or state habitat conservation plans are not expected to occur from development of the proposed project, and mitigation is not required.

Section 6 References

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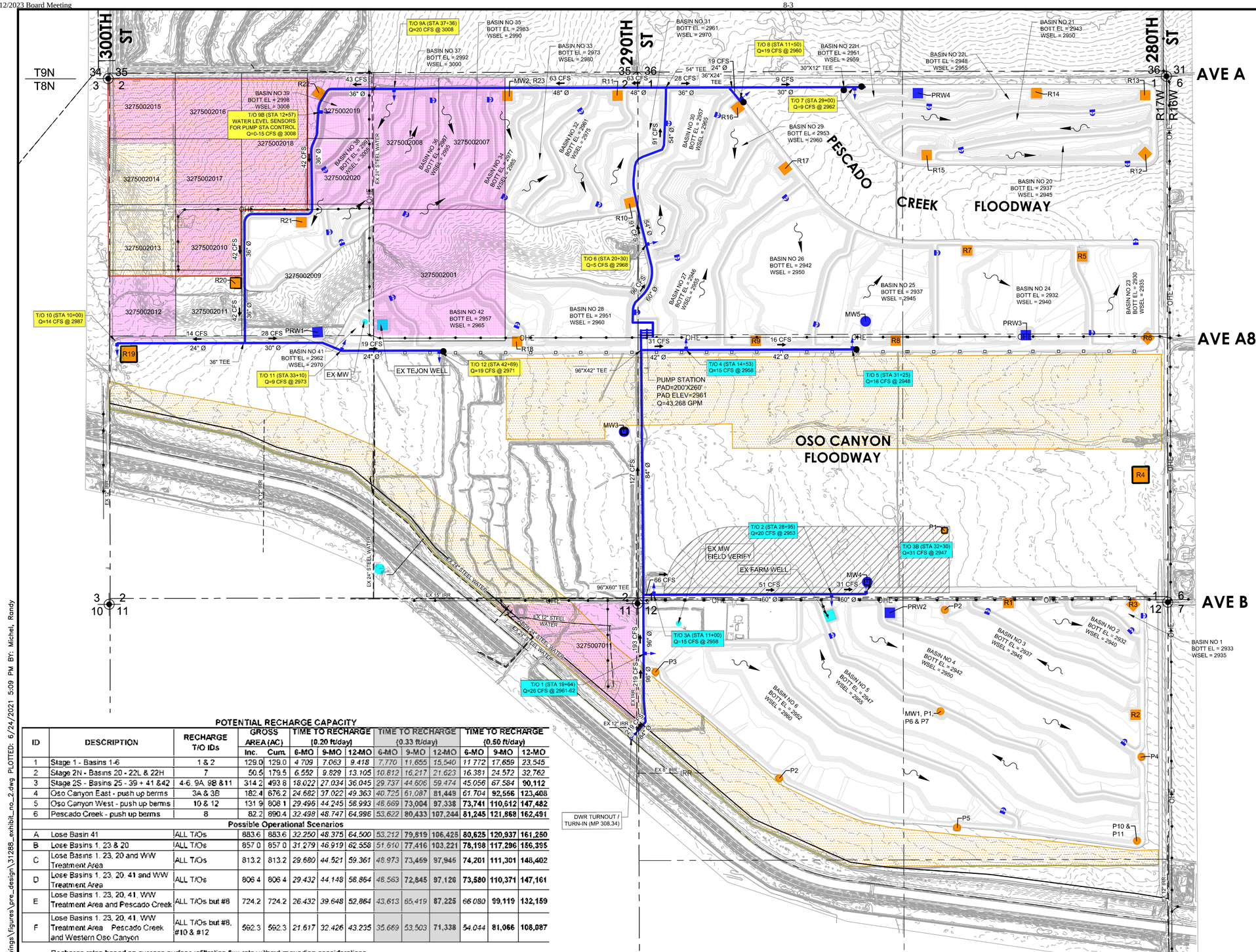
Appendix A Site Plans



LEGEND:

- USGS SECTION CORNER, (T8N, R17W)
- USGS SECTION LINE / MONUMENT LINE
- EXISTING SHALLOW WELL (LOW PRODUCTION)
- PILOT RECOVERY WELL
- FUTURE RECOVERY WELL
- EXISTING MONITORING WELL
- AVEK MONITORING WELL
- AVEK PIZOMETER LOCATION
- RECHARGE BASIN OVERFLOW SPILLWAY - GENERAL LOCATION
- DWR TURNOUT / TURN-IN STRUCTURE
- T/O 2 (STA 28+95) Q=20 CFS @ 2952 — DELIVERY TURNOUT ID, FILL RATE @ HGL (GRAVITY-FED BASIN)
- T/O 6 (STA 37+45) Q=20 CFS @ 3008 — DELIVERY TURNOUT ID, FILL RATE @ HGL (PUMP-FED BASIN)
- NC — ISOLATION VALVE - FULL CLOSED
- NO — ISOLATION VALVE - FULL OPEN
- 219 CFS, 84" Ø — DELIVERY PIPELINE, SIZE AND FLOW
- 36 CFS, 42" Ø — RETURN PIPELINE, SIZE AND FLOW
- RECHARGE BASIN CIRCULATION PATTERN

LAND USE LEGEND:

- CONSERVATION LANDS (322 ACRES)
- 3275002014 — APN PARCEL NUMBER (PERTINENT NUMBERS SHOWN)
- PARCELS OWNED BY TEJON RANCH
- POTENTIAL FUTURE RAW WATER TREATMENT - SET ASIDE AREA

NOTE: AERIAL IMAGE AND LIDAR MAPPING FLOWN MAY 2020.

POTENTIAL RECHARGE CAPACITY

ID	DESCRIPTION	RECHARGE T/O IDs	GROSS AREA (AC) Inc.	GROSS AREA (AC) Cum.	TIME TO RECHARGE (0.20 ft/day) 6-MO	9-MO	12-MO	TIME TO RECHARGE (0.33 ft/day) 6-MO	9-MO	12-MO	TIME TO RECHARGE (0.50 ft/day) 6-MO	9-MO	12-MO
1	Stage 1 - Basins 1-6	1 & 2	129.0	129.0	4.709	7.063	9.418	7.770	11.655	15.540	11.772	17.659	23.545
2	Stage 2N - Basins 20 - 22L & 22H	7	50.5	179.5	6.552	9.829	13.105	10.812	16.217	21.623	16.381	24.572	32.762
3	Stage 2S - Basins 25 - 39 + 41 &42	4-6, 9A, 9B &11	314.2	493.8	18.022	27.034	36.045	29.737	44.606	59.474	45.056	67.584	90,112
4	Oso Canyon East - push up berms	3A & 3B	182.4	676.2	24.682	37.022	49.363	40.725	61.087	81,449	61.704	92,556	123,408
5	Oso Canyon West - push up berms	10 & 12	131.9	808.1	29.496	44.245	58.993	48.669	73,004	97,338	73,741	110,612	147,482
6	Pescado Creek - push up berms	8	82.2	890.4	32.498	48.747	64.996	53.622	80,433	107,244	81,245	121,868	162,491
	Possible Operational Scenarios												
A	Lose Basin 41	ALL T/Os	883.6	883.6	32.250	48.375	64.500	53.212	79,819	106,425	80,625	120,937	161,250
B	Lose Basins 1, 23 & 20	ALL T/Os	857.0	857.0	31.279	46.919	62.558	51.610	77,416	103,221	78,198	117,296	156,395
C	Lose Basins 1, 23, 20 and WW Treatment Area	ALL T/Os	813.2	813.2	29.680	44.521	59.361	48.973	73,459	97,946	74,201	111,301	148,402
D	Lose Basins 1, 23, 20, 41 and WW Treatment Area	ALL T/Os	806.4	806.4	29.432	44.148	58.864	48.563	72,845	97,126	73,580	110,371	147,161
E	Lose Basins 1, 23, 20, 41, WW Treatment Area and Pescado Creek	ALL T/Os but #8	724.2	724.2	26.432	39.648	52.864	43.613	65,419	87,225	66.080	99,119	132,159
F	Lose Basins 1, 23, 20, 41, WW Treatment Area Pescado Creek and Western Oso Canyon	ALL T/Os but #8, #10 & #12	592.3	592.3	21.617	32.426	43.235	35.669	53,503	71,338	54.044	81,066	108,087

Recharge rates based on average surface infiltration flux rate without mounding considerations

NO.	DATE	REVISIONS	APPROVED

Stantec
38 TECHNOLOGY DRIVE, SUITE 100
IRVINE, CA 92618
949.923.6000 stantec.com

DAHL consultants

PRELIMINARY SUBJECT TO CHANGE

JOSEPH F. LONG — NAME
PROJECT MANAGER R.C.E. 54329 — 6/24/2021 DATE

PRELIMINARILY NOT FOR CONSTRUCTION
THIS DOCUMENT ILLUSTRATES CURRENT PRELIMINARY DESIGN FEATURES SUBJECT TO REVISION DURING FINAL DESIGN. INTENDED FOR PLANNING, PRESENTATION AND REVIEW DISCUSSION ONLY. DO NOT USE FOR PERMITTING, CONSTRUCTION, OR OTHER PURPOSE BEYOND THIS INTENDED USE.

ANTELOPE VALLEY - EAST KERN WATER AGENCY

HDWB - PRELIMINARY DESIGN
SITE LAYOUT WITH CONSTRUCTION
ITEMS FOR RECHARGE OPERATIONS

DELIVERY SYSTEM

PRELIMINARY DESIGN

EXHIBIT NO 2

HIGH DESERT WATERBANK -PRELIMINARY DESIGN WORKSHOP

JUNE 2021

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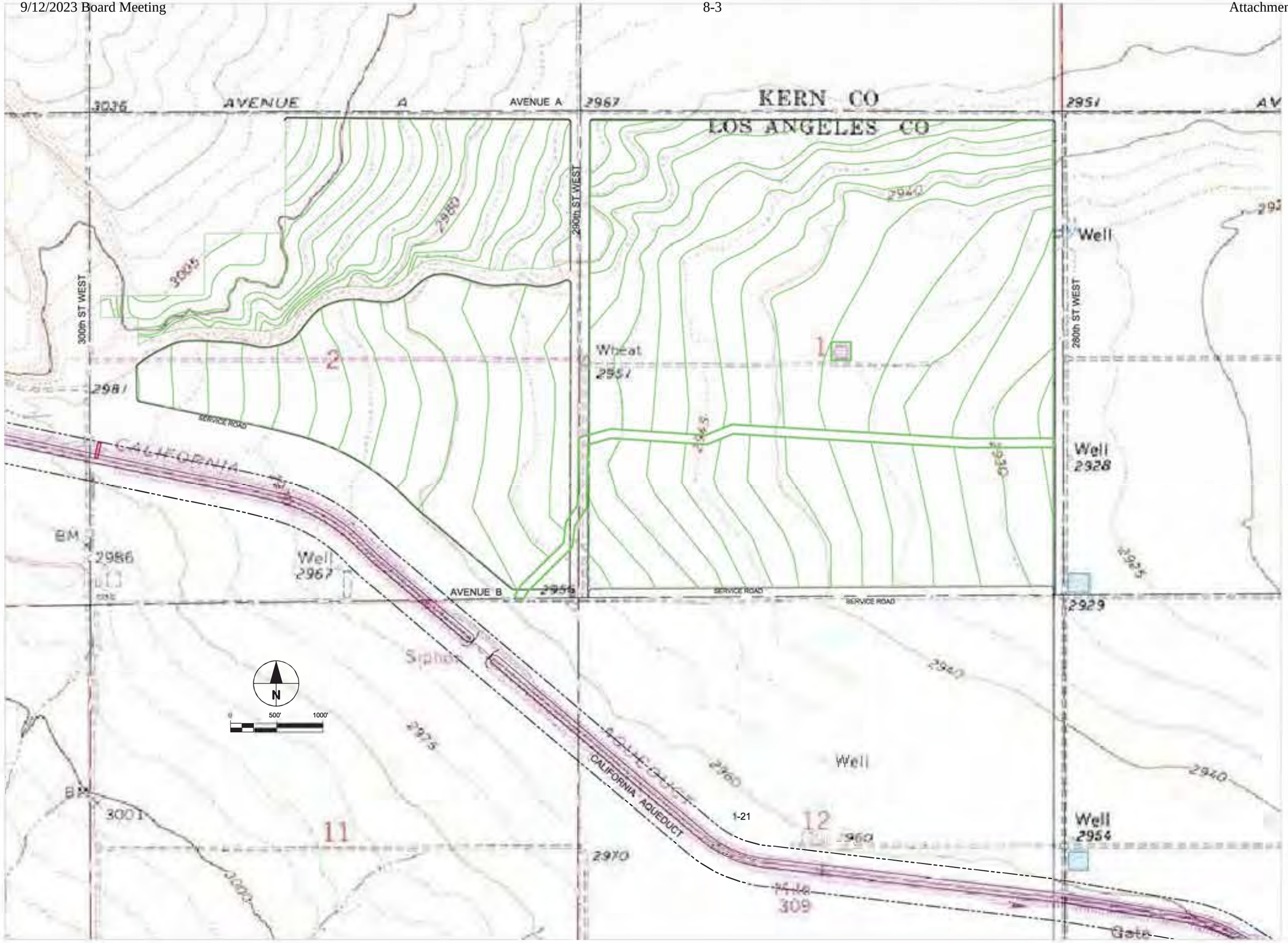

CONSULTANT
AECOM

AECOM Water
5001 E. Commercenter Dr.
Bakersfield Ca. 93309
661.283.2323 tel 661.395.0359 fax
www.aecom.com

REGISTRATION

CLIENT

ANTELOPE VALLEY-
EAST KERN
WATER AGENCY

6500 WEST AVENUE N
PALMDALE CA. 9355-2855
661.943.3201 tel 661 943.3204 fax
www.avek.org

A PUBLIC AGENCY

ISSUE/REVISION

I/R	DATE	DESCRIPTION
	YYYY-MM-DD	

PROJECT

HIGH DESERT WATER
BANK

PROJECT NUMBER

60537613

SHEET TITLE

ORIGINAL SCHEMATIC FLOOD
RECHARGE OPERATIONS

SHEET NUMBER

FIGURE 2

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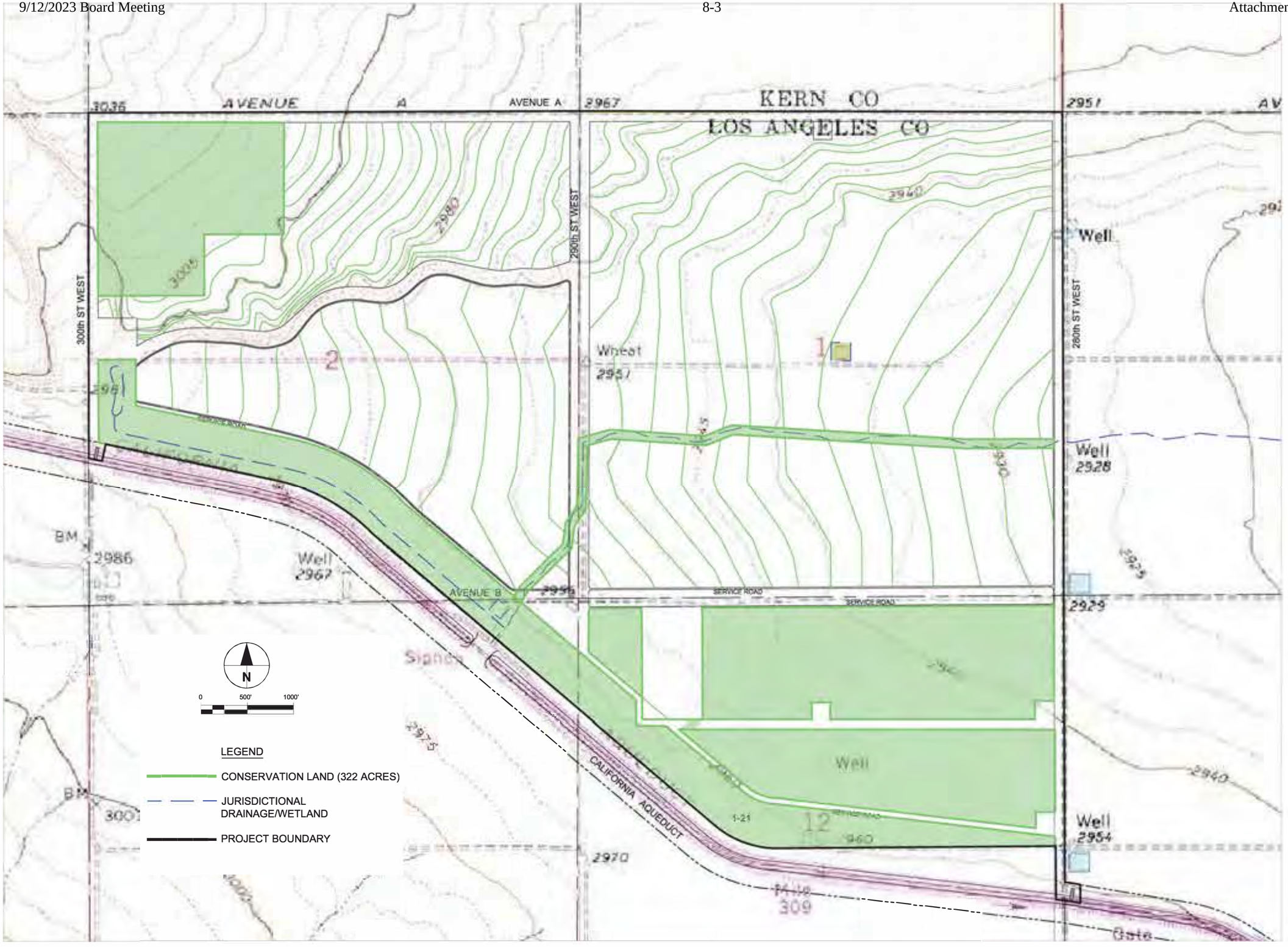

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I/R	DATE	DESCRIPTION
	YYYY-MM-DD	

PROJECT
HIGH DESERT WATER BANK

PROJECT NUMBER
60537613

SHEET TITLE
ORIGINAL CONSERVATION PLAN

SHEET NUMBER
FIGURE 13

Project Management Initials: Designer: Checked: Approved: ANSI D 22" x 34"
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Appendix B Site Photographs

Photograph 1: From the northeast corner of the project site looking west along the northern boundary.

Photograph 2: From the northeast corner of the project site looking south along the eastern boundary.

Photograph 3: From the southeast corner of the project site looking north along the eastern boundary.

Photograph 4: From the southeast corner of the project site looking west along the southern boundary.

Photograph 5: From the southwest corner of the project site looking east along the southern boundary.

Photograph 6: From the southeast corner of the project site looking north along the western boundary.

Photograph 7: Representative photograph of the fallow agriculture supported in the northwest portion of the project site.

Photograph 8: Rubber rabbitbrush scrub occurs throughout the project site in varying densities.

Photograph 9: A small patch of sandbar willow thicket grows adjacent to the pump station water basin.

Photograph 10: Non-native grassland occurs throughout the project site.

Photograph 11: Disturbed land occurs throughout the site. This area supports suitable burrows for roosting by burrowing owls.

Photograph 12: Rubber rabbitbrush scrub surrounding remnant foundations from historic agricultural activities.

Appendix C Potentially Occurring Special-Status Biological Resources

Table C-1: Potentially Occurring Special-Status Biological Resources

Scientific Name Common Name	**Status**	**Habitat Description**	**Observed On-site**	**Potential to Occur**
SPECIAL-STATUS WILDLIFE SPECIES				
Agelaius tricolor tricolored blackbird	Fed: None CA: **THR**; SSC	Highly colonial yearlong resident of California that frequents emergent wetlands, croplands, grassy fields, flooded land and along edges of ponds. Usually nests near fresh water, preferably in emergent wetland with tall, dense cattails (*Typha sp.*) or tules (*Schoenoplectus sp.*), but also in thickets of willow (*Salix sp.*), blackberry (*Rubus sp.*), and tall herbs.	No	**Low** There is no suitable habitat present within the project site; however, suitable habitat is present outside of site boundaries beyond the California Aqueduct. No suitable nesting habitat is present on-site.
Anniella pulchra northern California legless lizard	Fed: None CA: SSC	Occurs primarily in areas with sandy or loose loamy soils under sparse vegetation of beaches, chaparral, or pine-oak woodland; or near sycamores, oaks, or cottonwoods that grow on stream terraces. Often found under or in the close vicinity of logs, rocks, old boards, and the compacted debris of woodrat nests.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Aquila chrysaetos golden eagle	Fed: None CA: FP; WL	Occupies nearly all terrestrial habitats of the western states except densely forested areas. Favors secluded cliffs with overhanging ledges and large trees for nesting and cover. Hilly or mountainous country where takeoff and soaring are supported by updrafts is generally preferred to flat habitats. Deeply cut canyons rising to open mountain slopes and crags are ideal habitat.	No	**Low** The project site provides limited foraging habitat. Suitable nesting habitat may be found in the mountains to the south.
Aspidoscelis tigris stejnegeri coastal whiptail	Fed: None CA: SSC	Found in a variety of ecosystems, primarily hot and dry open areas with sparse foliage such as chaparral, woodland, and riparian areas.	No	**Low** The project site provides limited foraging and cover habitat.
Athene cunicularia burrowing owl	Fed: None CA: SSC	Prefers habitat with short, sparse vegetation with few shrubs and well-drained soils in grassland, shrub steppe, and desert habitats. Primarily a grassland species, but it persists and even thrives in some landscapes highly altered by human activity. Occurs in open, annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. The overriding characteristics of suitable habitat appear to be burrows for roosting and nesting and relatively short vegetation with only sparse shrubs and taller vegetation.	No	**High** The project site provides line-of-sight opportunities favored by burrowing owls. In addition, the site supports suitable burrows (>4 inches in diameter) for roosting. No burrowing owls and/or sign were observed during the field investigation.

Scientific Name Common Name	**Status**	**Habitat Description**	**Observed On-site**	**Potential to Occur**
Bombus crotchii Crotch bumble bee	Fed: None CA: CE	Colonial species that lives almost exclusively from coastal California east towards the Sierra-Cascade Crest and can be found uncommonly in western Nevada and south through Baja California. Inhabits grassland and scrub habitats in hotter and drier climates than most other bumblebee species and is only capable of tolerating a narrow range of climatic conditions. Feeds on a variety of annual and perennial plant species, classifying it as a dietary generalist. This species usually nests underground, often in abandoned rodent dens.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Buteo regalis ferruginous hawk	Fed: None CA: WL	Occurs primarily in open grasslands and fields, but may be found in sagebrush flats, desert scrub, low foothills, or along the edges of pinyon-juniper woodland. Feeds primarily on small mammals and typically found in agricultural or open fields.	No	**High** The project site provides suitable foraging habitat. Suitable nesting habitat may be found in the mountains to the south.
Lanius ludovicianus loggerhead shrike	Fed: None CA: SSC	Prefers open habitats with bare ground, scattered shrubs, and areas with low or sparse herbaceous cover including open-canopied valley foothill hardwood, riparian, pinyon-juniper, desert riparian, creosote bush scrub, and Joshua tree woodland. Requires suitable perches including trees, posts, fences, utility lines, or other perches.	Yes	**Present** Suitable foraging and nesting habitat are present within the project site.
Perognathus alticola inexpectatus Tehachapi pocket mouse	Fed: None CA: SSC	Occurs in native and non-native grasslands, Joshua tree woodland, pinyon-juniper woodland, yellow pone woodland, and oak savannah. Constructs burrows in loose, sandy soil.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Phrynosoma blainvillii coast horned lizard	Fed: None CA: SSC	Occurs in a wide variety of vegetation types including coastal sage scrub, annual grassland, chaparral, oak woodland, riparian woodland and coniferous forest. In inland areas, this species is restricted to areas with pockets of open microhabitat, created by disturbance (i.e. fire, floods, roads, grazing, fire breaks). The key elements of such habitats are loose, fine soils with a high sand fraction; an abundance of native ants or other insects; and open areas with limited overstory for basking and low, but relatively dense shrubs for refuge.	No	**Low** The project site provides suitable foraging habitat and limited burrowing habitat. Soils on-site are generally too compact and rocky, for burrowing.
Plegadis chihi white-faced ibis	Fed: None CA: WL	Prefers to feed in fresh emergent wetland, shallow lacustrine waters, muddy ground of wet meadows, and irrigated or flooded partures and croplands. Nests in dense, fresh emergent wetland.	No	**Low** There is no suitable habitat present within the project site; however, suitable habitat is present outside of site boundaries beyond the California Aqueduct. No suitable nesting habitat is present on-site.

Scientific Name Common Name	**Status**	**Habitat Description**	**Observed On-site**	**Potential to Occur**
Setophaga petechia yellow warbler	Fed: None CA: SSC	Nests over all of California except the Central Valley, the Mojave Desert region, and high altitudes and the eastern side of the Sierra Nevada. Winters along the Colorado River and in parts of Imperial and Riverside Counties. Nests in riparian areas dominated by willows, cottonwoods, sycamores, or alders or in mature chaparral. May also use oaks, conifers, and urban areas near stream courses.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Taxidea taxus American badger	Fed: None CA: SSC	Primarily occupy grasslands, parklands, farms, tallgrass and shortgrass prairies, meadows, shrub-steppe communities and other treeless areas with sandy loam soils where it can dig more easily for its prey. Occasionally found in open chaparral (with less than 50% plant cover) and riparian zones.	No	**Low** The project site provides limited foraging and burrowing habitat.
Xanthocephalus xanthocephalus yellow-headed blackbird	Fed: None CA: SSC	Uncommon yearlong resident of southern California throughout freshwater emergent wetlands, and moist, open areas along agricultural areas, and mudflats of lacustrine habitats. Prefers to nest in dense wetland vegetation characterized by cattails, tules, or other similar plant species along the border of lakes and ponds.	No	**Low** There is no suitable habitat present within the project site; however, suitable habitat is present outside of site boundaries beyond the California Aqueduct. No suitable nesting habitat is present on-site.
SPECIAL-STATUS PLANT SPECIES				
Androsace elongata* ssp. *acuta California androsace	Fed: None CA: None CNPS: 4.2	Occurs in chaparral, cismontane woodland, coastal scrub, meadows and seeps, pinyon and juniper woodland, and valley and foothill grasslands. Found at elevations ranging from 492 to 4,280 feet. Blooming period is from March to June.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Calochortus palmeri* var. *palmeri Palmer's mariposa-lily	Fed: None CA: None CNPS: 1B.2	Occurs in meadows and seeps, chaparral, and lower montane coniferous forest in vernally moist places. From 3,281 to 7,841 feet in elevation. Blooming period is from April to July.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site. The project site occurs outside of the known elevation range for this species.
Chorizanthe spinosa Mojave spineflower	Fed: None CA: None CNPS: 4.2	Grows in alkaline or non-alkaline soils in chenopod scrub, Joshua tree woodland, Mojavean desert scrub, and playas. Found at elevations ranging from 20 to 4,265 feet. Blooming period is from March to July.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Delphinium parryi* ssp. *purpureum Mt. Pinos larkspur	Fed: None CA: None CNPS: 4.3	Grows in chaparral, Mojavean desert scrub, and pinyon and juniper woodlands. Found at elevations ranging from 3,280 to 8,530 feet. Blooming period is from May to June.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site. The project site occurs outside of the known elevation range for this species.
Goodmania luteola golden goodmania	Fed: None CA: None CNPS: 4.2	Grows on alkaline or clay soils within Mojavean desert scrub, meadows and seeps, playas, and valley and foothill grassland habitats. Found at elevations ranging from 70 to 7,220 feet. Blooming period is from April to August.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.

Scientific Name Common Name	**Status**	**Habitat Description**	**Observed On-site**	**Potential to Occur**
Microseris sylvatica sylvan microseris	Fed: None CA: None CNPS: 4.2	Grows within chaparral, cismontane woodland, Great Basin scrub, pinyon and juniper woodland and valley and foothill grassland (serpentine) habitats. Found at elevations ranging from 150 to 4,920 feet. Blooming period is from March to June.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Muhlenbergia utilis aparego grass	Fed: None CA: None CNPS: 2B.2	Native to north and central America. Grows in wet habitats, including riverbanks and meadows, sometimes alkaline soils. Found at elevations ranging from 25 to 2,325 feet. Blooming period is from October to March.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Perideridia pringlei adobe yampah	Fed: None CA: None CNPS: 4.3	Grows in serpentinite, often clay soils in chaparral, cismontane woodland, coastal scrub, and pinyon-juniper woodlands. Blooming period is from April to June or July, depending on seasonal rainfall. Grows in elevation from 984 to 5,906 feet.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Syntrichopappus lemmonii Lemmon's syntrichopappus	Fed: None CA: None CNPS: 4.3	Occurs in sandy or gravelly soils within chaparral, Joshua tree woodland, and Pinyon and juniper woodland habitats. Found at elevations ranging from 1,640 to 6,004 feet above msl. Blooming period is from April to May (June).	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Yucca brevifolia western Joshua tree	Fed: None CA: **CE** CNPS: N/A	Occurs in a variety of arid habitats within the Mojave Desert. Found at elevations ranging from 1,600 to 6,600 feet. Blooming period is from March to June.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
SPECIAL-STATUS PLANT COMMUNITIES				
Southern Cottonwood Willow Riparian Forest	CDFW Sensitive Habitat	Dominated by cottonwood (*Populus* sp.) and willow (*Salix* sp.) trees and shrubs. Considered to be an early successional stage as both species are known to germinate almost exclusively on recently deposited or exposed alluvial soils.	No	**Absent**
Southern Riparian Scrub	CDFW Sensitive Habitat	Riparian zones dominated by small trees or shrubs, lacking taller riparian trees.	No	**Absent**
Valley Needlegrass Grassland	CDFW Sensitive Habitat	Occur as patches of native grasslands within valleys. Dominated by perennial bunch grasses with herbaceous annuals intermixed. Supports early successional sub-shrub and suffrutescent species.	No	**Absent**
Valley Oak Woodland	CDFW Sensitive Habitat	Habitat varies from savanna-like to forest-like with partially closed canopies. Dominated almost exclusively by valley oak and comprised mostly of winder-deciduous, broad-leaved species.	No	**Absent**

U.S. Fish and Wildlife Service (Fed) - Federal
END – Federal Endangered
THR – Federal Threatened
DL - Delisted

California Department of Fish and Wildlife (CA) - California
END – California Endangered
THR – California Threatened
CTHR – California Candidate Threatened
DL - Delisted

California Native Plant Society (CNPS) - *California Rare Plant Rank*
1B Plants Rare, Threatened, or Endangered in California and Elsewhere
2B Plants Rare, Threatened, or Endangered in California, but More Common

Threat Ranks
0.2- Moderately threatened in California
0.3- Not very threatened in California

FP – California Fully Protected
SSC – California Species of Special Concern
WL – California Watch List
CE – Candidate Endangered

Elsewhere
4 Plants of Limited Distribution – A Watch List

Appendix D Mitigation Monitoring and Reporting Program

Antelope Valley – East Kern Water Agency

High Desert Water Bank

California Environmental Quality Act (CEQA)

Mitigated Negative Declaration

SCH No. 2017061030

Mitigation Monitoring and Reporting Program

December 2017

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1. General

The Mitigated Negative Declaration (MND) for the Antelope Valley – East Kern Water Agency (AVEK or Agency) High Desert Water Bank (the Project) specified a number of mitigation measures to be undertaken during implementation of the proposed project. During implementation, it is essential that all of these be fully complied with and that compliance be documented in a timely manner. Failure to comply with and or document compliance could result in a challenge to the project that could result in project delays.

This Mitigation Monitoring and Reporting Program (MMRP) has been prepared for the project and has been adopted concurrently with the findings of the Initial Study and Mitigated Negative Declaration. This plan is intended to track compliance of all of the mitigation measures adopted with the Mitigated Negative Declaration.

2. Responsibility for Compliance and Documentation

Implementation of the MMRP will be the responsibility of the Agency. The Agency will assign a project manager to oversee all aspects of implementation of the proposed project and ensure that the mitigation and monitoring commitments made in the MND are carried out in a timely and effective manner. In implementing the MMRP, the Agency will often rely on the expertise of outside consultants and contractors. To ensure the effectiveness of this mitigation and monitoring, the Agency will:

- Make the MMRP an element of all project-related requests for proposals and contract specifications, specifying that construction contractors will be responsible for appropriate acquisition of permits for construction and implementation of relevant mitigation and monitoring elements, as specified in this MMRP;
- Independently review contractor compliance on a regular basis and require corrective actions in a timely manner when the Agency determines that such actions are required;
- Maintain files, open to the public for inspection, documenting compliance with the MMRP;
- Designate an Agency staff member to receive and respond to all public and Agency comments, complaints, and/or questions regarding compliance with the MMRP; and
- Provide regulatory agencies with appropriate and timely documentation of compliance as specified in regulatory permits issued for the proposed project.

Additionally, the Agency will require that construction contractors designate a principal mitigation and monitoring manager (Principal) and back-up mitigation and monitoring manager (Alternate) and shall ensure that at least one of these is on-site during all phases of construction. These persons may perform other tasks, but shall have adequate time, training, and expertise to perform the required monitoring and documentation. The Principal shall be the contractor's construction field supervisor or assistant field supervisor. The Principal or Alternate shall independently verify compliance with required mitigation measures and shall indicate verification by filling out and signing the appropriate compliance checklist, thereby certifying compliance with all measures.

3. Permits and Coordination

The MND identifies a number of permits which may need to be obtained for various aspects of the Proposed Project, as well as commitments to coordinate design, pre-construction, and

construction activities with various local, regional, State, and Federal agencies. Permits and coordination commitments are:

- Encroachment Permits for any work within Public Right of Way.
- National Pollutant Discharge Elimination System Construction Activities General Permit.
- Department of Water Resources Turnout Construction and Operations Permit.
- Department of Water Resources Encroachment Permit (if needed)
- Caltrans heavy or oversized equipment Transportation Permit (if needed).

4. Incidents and Compliance Reporting

Timely reporting of compliance and of any incidents which may result in non-compliance is essential. Contracts for construction and for independent compliance contractors shall therefore specify that, if the designated construction contractor for an activity determines that any aspect of construction is not in substantive compliance with the mitigation requirements for the activity, the contractor shall immediately take action to remedy the problem. The designated Principal or Alternate shall notify the Agency within not more than 24 hours following determination that any aspect of construction activity is not in compliance with mitigation requirements, shall explain how the incident has been addressed, and shall provide any other information requested by the Agency. Following action to address the out-of-compliance incident, the designated Principal or Alternate must complete an "incident report" and submit a copy of the report to the Agency's project manager within one week of the incident.

5. Mitigation and Monitoring Program Update

The Agency recognizes that laws, regulations, and policies related to construction activities may change during construction. The Agency's project manager is responsible for periodically reviewing the status of laws, regulations, and guidelines applicable to their construction activity. The Agency will implement any new rules in effect at the time of approval.

6. Staff Awareness

Staff must be informed of mitigation and monitoring requirements prior to construction. New staff must be oriented when they come on site. The Principal/Alternate therefore needs to review compliance requirements and monitoring requirements for the job with all personnel on site to ensure that they know the requirements, know the importance of compliance, know that violations must be reported, and know that compliance is a condition of employment on this job. Similarly, a summary list of mitigation and monitoring requirements shall be posted in a conspicuous location at the job site so that they may be referred to at any time.

7. Training

If specialized expertise is necessary for mitigation or monitoring, Agency staff or the delegated construction contractor shall provide such training to the persons responsible for compliance and/or monitoring. For example, if biological pre construction surveys identify the presence of a special status species, the Agency shall retain the services of a qualified biologist familiar with this species to provide environmental training for the identification and protection of same.

8. On Going Documentation

Compliance will be monitored on a timely basis, depending on the nature of the activity and the

Mitigation requirement. Where appropriate. photo documentation of pre-construction conditions, of activities during construction, of any incidents that may constitute a violation of mitigation requirements, and of post construction conditions are encouraged. However, if photo documentation is adopted as a monitoring tool, it must be used consistently to ensure that there are records of all activities for which compliance must be documented. Labels must be explanatory and contain adequate information about the photographer, date, time, and conditions when the photo was taken. Photo documentation shall be backed up with paper copies and/or records on CD/DVD. Agency staff may audit records of compliance with mitigation and monitoring requirements at any time and compliance records must be readily available and in good order. Logs of mitigation and monitoring compliance should be maintained and supporting documentation should be provided in parallel to the log. The Agency and its project manager and other contractors will maintain such records in a form suitable for the required monitoring and reporting. It is anticipated that contractors will generally have appropriate monitoring templates for typical construction activities. In other cases, the format of compliance monitoring records may be available from the regulatory Agency approving the monitoring (if any).

9. Pre-Construction Training

Prior to initiation of construction activity, the Agency will review the mitigation commitments in this MMRP and will determine the need for pre-construction training. The Agency and its contractors will prepare appropriate training materials and provide appropriate training to construction staff to ensure that they fully understand compliance and reporting requirements. It is anticipated that pre-construction training may be necessary for the following:

- Activities that involve excavation (cultural, biological, dust, noise, traffic)
- Activities that involve use of heavy equipment (dust, noise)
- Activities in the vicinity of trees (biological)
- Activities in the vicinity of public and private utilities

10. Mitigation and Monitoring Requirements

The following includes a list of all of the mitigation measures identified in the MND.

AGRICULTURAL RESOURCES

AG-1: Prime Farmland Avoidance – The Agency will not perform recharge operations on the 60 acres of semi active farmed Prime Farmland on the northwest corner of the property.

AIR QUALITY

AQ-1: Minimization Measure for NOx Related Emissions - Construction contractor shall use off road construction diesel engines that meet, at a minimum, the Tier 4 interim California Emissions Standards, unless such an engine is not available for a particular item of equipment. Tier 3 engines will be allowed on a case by case basis when the contractor has documented that no Tier 4 interim equipment or emissions equivalent retrofit equipment is available for a particular equipment type that must be used to complete construction. Documentation shall consist of signed written statements from at least two construction equipment rental firms.

BIOLOGICAL RESOURCES

BIO-1 : Burrowing Owls – Prior to ground-disturbing activities and other habitat disturbance, clearance surveys for active burrowing owl burrows shall be conducted of all areas subject to disturbance. Prior to ground-disturbance associated with construction of the Project, including vegetation clearance and grubbing, preconstruction clearance surveys shall be conducted by a

qualified biologist within the Project site and a 500-foot buffer of the site in order to locate active burrowing owl burrows. Pre-construction clearance surveys shall be conducted no more than two (2) weeks prior to construction. Surveys will be conducted following guidelines provided in the *Staff Report on Burrowing Owl Mitigation* (CDFW 2012).

Within two (2) weeks prior to inundation, trained AVEK personnel shall review all areas subject to inundation for presence of burrows with entrances suitable for burrowing owl occupation and potential burrowing owl sign. Any identified potentially occupied burrows will be investigated further by a qualified biologist prior to inundation. Training will be conducted by a qualified biologist for AVEK personnel who conduct pre-inundation surveys prior to the commencement of the first inundation survey. Training will discuss burrowing owl identification and sign and burrow recognition, their status, and the laws governing their protection. Training will be conducted by a qualified biologist on an annual basis for all Project operations personnel as a refresher.

If no burrowing owls are detected, no further mitigation will be required. If burrowing owls are observed during any survey, the following measures will be implemented:

- Occupied burrows will not be disturbed during the nesting season (April 1 through October 15).
- Occupied burrows will not be subject to inundation during operation of the water bank.
- Avoidance shall be the preferred approach for occupied burrows whenever feasible. If occupied burrows are observed during the non-breeding season (October 16 through March 31), a 160-foot buffer will be established; no construction or other physical work activities will occur within the buffer. If occupied burrows are observed during the breeding season (April 1 through October 15), and a 650-foot buffer shall be established; no construction or other physical work activities will occur within the buffer.
- When destruction of occupied burrows is unavoidable, destruction shall occur only during the non-nesting season (October 16 through March 31). Prior to destruction of occupied burrows within the Project site, any unsuitable burrows outside the disturbance footprint will be enhanced (enlarged, cleared of debris) to facilitate occupation.
- If owls must be moved away from the Project area, passive relocation techniques (e.g., installation of one-way exclusion doors at burrow entrances) will be used instead of trapping. ~~A~~ Passive relocation techniques will be employed for a minimum of one week in order to allow owls to acclimate to alternate burrows.

In order to provide protections for burrowing owls throughout construction and operations of the Project, a Burrowing Owl Protection Plan shall be developed prior to construction of the recharge basins. This plan will provide acceptable strategies for avoiding and minimizing impacts to burrowing owls and burrowing owl habitat on the Project site.

BIO-2 : Desert Kit Fox and American Badger – Clearance surveys for occupied desert kit fox and American badger dens shall be conducted prior to any Project disturbance activities, including initial construction and ongoing operations such as inundation of the recharge basins.

Within two (2) weeks prior to the start of construction, a qualified biologist shall conduct pre-construction clearance surveys of the work area and a 150-foot buffer for signs of desert kit fox and American badger, including active and inactive natal and non-natal dens, scat, prey remains, and tracks. All suitable denning locations shall be investigated for use.

Within two (2) weeks prior to inundation of the basins, trained AVEK personnel shall review all areas subject to inundation for potential sign of American badger or desert kit fox, including active and inactive natal and non-natal dens. Any identified potential sign of presence will be investigated further by a qualified biologist prior to inundation. Training will be conducted by a qualified biologist for AVEK personnel who conduct pre-inundation surveys prior to the commencement of the first inundation survey. Training will discuss American badger and desert kit fox identification and sign and den recognition, their status, and the laws governing their protection. Training will be conducted by a qualified biologist on an annual basis for all Project operations personnel as a refresher.

If dens are observed, the following measures will be implemented:

- Occupied dens will not be subject to inundation during operation of the water bank.
- Inactive dens shall be excavated by hand with a shovel to prevent badgers/kit foxes from re-using dens during construction.
- If active natal dens are observed during the survey, a buffer of 300 feet shall be established around the den; no construction or work activities will occur within the buffer. The den shall be monitored and the buffer maintained until a qualified biologist has determined that the den is no longer active, at which time it shall be excavated by hand to prevent re-use. Passive relocation of American badger and desert kit fox shall not take place while young are still in dens and dependent on the parents for food, or while females may be pregnant.
- If active, non-natal dens are observed within the Project site or buffer, badgers/kit foxes shall be discouraged from using these dens prior to clearing, grubbing, and/or grading of the site, by partially blocking the entrance of the den with sticks, debris, and soil for 3 to 5 days. Access to the den shall be incrementally blocked to a greater degree over this period, encouraging the badger/kit fox to vacate the den of its own volition. After badgers/kit foxes have stopped using active dens within the Project boundary, the dens shall be hand-excavated with a shovel to prevent re-use.
- If newly active badger/kit fox dens are found during construction activities, all work in the area shall cease until the biologist can safely close the den.
- If a desert kit fox or American badger is encountered during Project activities, all work that could result in a direct injury, disturbance, or harassment shall immediately stop and the Project biologist shall be notified.
- Where desert kit foxes have the potential to occur, all heavy equipment and vehicles left on-site overnight will be inspected at the beginning of each work day to verify that no individuals have taken shelter under the equipment. If a desert kit fox is observed, the project biologist shall be notified and the animal shall be observed from a distance until it has moved out of the area of its own accord.

BIO-3 : Nesting Birds - If construction activities occur within the breeding bird season (February 1 through September 15), all vegetation clearing and initial ground disturbing activities will be preceded by a nesting bird survey. Nesting bird surveys will be conducted by a qualified biologist of all areas that may support nesting and will be subject to disturbance, as well as a 300-foot buffer for passerine species and 500-foot buffer for raptors. Surveys will be conducted no more than 7 days prior to construction activities.

- If an active nest is observed, a no-disturbance buffer will be established until a qualified biologist has determined the nest has either failed or has successfully fledged and the young are no longer dependent on the nest. The no-disturbance buffer will measure no less than 500 feet for raptors, and 300 feet for all other species.

BIO-4 : Animal Movement and Entrapment (Trenches) - All trenches that are to be left open overnight shall be either securely covered or have wildlife escape ramps installed during non-work hours to prevent entrapment of common and special-status wildlife species. All steep-walled pipeline and utility trenches shall be inspected in the mornings and prior to backfilling to prevent mortality of common and special-status wildlife species. All entrapped wildlife shall be removed or allowed to escape voluntarily via escape ramps prior to construction resuming.

BIO-5 : Animal Movement and Entrapment (Pipes) – All pipes, culverts, or similar structures on-site with a diameter of 2 to 24 inches shall be inspected for special-status species prior to moving or welding. Openings shall be capped or otherwise covered if sections cannot be inspected to prevent the entry and potential loss of wildlife. If a common or special-status species is discovered inside a pipe, the animal shall be safely removed by a qualified biologist. The pipe segment shall not be moved until the animal has escaped, or the pipe segment shall be moved a single time out of the path of construction. Alternatively, stored pipe may be kept capped at all times until used during construction. Vertical, open-ended pipes used as fence posts, property line demarcations, sign posts, etc., will be capped or otherwise plugged to prevent the entrapment and possible injury and mortality of wildlife.

BIO-6 : Erosion and Sediment Control - Best available erosion and sediment control measures will be employed to prevent downstream dispersal of sediments during and following Project-related activities. These measures may include sediment basins, gravel bags, silt fences, geo-bags, or gravel and geotextile fabric berms, erosion control blankets, coir rolls, jute net, and straw bales. The use of erosion control materials potentially harmful to wildlife species, including monofilament netting (erosion control matting) or similar material, will not be employed.

BIO-7 : Special-Status Plants - Prior to construction of the recharge basins, floristic surveys shall be conducted of all potentially suitable habitats on the Project site. Floristic surveys shall be conducted by a qualified biologist following CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW 2009). If no special-status plants are observed, no further mitigation will be necessary. If special-status plants are observed during surveys, the following measures will be implemented:

- Individuals will be protected in place to the extent feasible through implementation of avoidance and buffers.
- If special-status plant individuals or populations must be impacted, individuals will be salvaged and/or transplanted to suitable habitat within the established on-site habitat management lands. If salvage is not feasible, mitigation at a 2:1 ratio will be provided within habitat management lands. In the case of annual species, top soil salvage may be employed to preserve the existing seed bank where appropriate enhancement of existing populations may be employed at the same 2:1 ratio.

BIO-8 : Swainson's Hawk - Prior to construction of the recharge basins, focused Swainson's hawk surveys shall be conducted. Surveys for Swainson's hawk shall be conducted by a qualified biologist following the methods outlined in Swainson's Hawk Survey Protocols, Impact Avoidance, and Minimization Measures for Renewable Energy Projects in the Antelope Valley of Los Angeles and Kern Counties, California (CDFW 2010). Surveys shall include all potential Swainson's hawk nesting habitat within a 5 mile radius of the Project site. Surveys shall include all potential nest trees, towers or other potential nest sites (including nests used within the last 5 years) outside the nesting season for Swainson's hawk.

If no active Swainson's nests are observed, no further mitigation will be necessary. If an active Swainson's hawk nest is detected during focused surveys, the following measures will be

implemented:

- No removal of active Swainson's hawk nests will be conducted during Project construction and/or operations.
- No construction activities will be conducted within a 0.5-mile radius of an active Swainson's hawk nest. Prior to construction activities, a qualified biologist will conduct a focused Swainson's hawk nest survey within an up to 0.75-mile radius of proposed construction activities to identify any active nests.
- If active Swainson's hawks nests are identified within a 0.5-mile radius of the Project site, a Habitat Management Plan will include specific, detailed measures to avoid and minimize impacts to Swainson's hawks in or near the Project site during both construction and operation of the Project.

BIO-9 : Tri-colored Blackbirds - While the Initial Study indicates that impacts to tricolored blackbird foraging habitat due to Project-related activities are less than significant, at the request of the CDFW focused nesting season surveys will be conducted as follows: Prior to construction of the recharge basins, focused nesting tri-colored blackbird surveys shall be conducted of all potentially suitable nesting habitats and documented nesting colonies within the Project site and within a 3-mile radius of the Project site for any active nesting colonies.

BIO-10 : Jurisdictional Drainages and Wetlands - Prior to construction of the recharge basins or any ground-disturbing activities within waterways and wetlands on the site, a formal Jurisdictional Delineation will be conducted of all potential jurisdictional waters within the Project site. Fill or disturbance of any jurisdictional waters or wetlands will be permitted through the appropriate agency (i.e., Sections 401 and 404 of Clean Waters Act, or Section 1600 of California Fish and Game Code). Impacts to jurisdictional waters and wetlands will be avoided to the extent feasible, and shall not occur prior to issuance of any required local, state, and federal permits.

BIO-11 : Habitat Mitigation - AVEK will designate a significant allotment of land as habitat management lands. The purpose of these areas is to provide foraging habitat for Swainson's hawk, tricolored blackbird, nesting and foraging habitat for burrowing owl, and denning and foraging habitat for desert kit fox and American badger. The details of the management of these lands shall be described in a *Habitat Management Plan* to be prepared prior to construction of the recharge basins.

BIO-12 : General Biological Measures –

Worker Environmental Awareness Training - Prior to construction, a Worker Environmental Awareness Training shall be prepared and presented by a qualified biologist to all construction personnel at the start of Project-related activities. The training shall discuss sensitive-status species with the potential to occur within the Project footprint, including their regulatory status, description, and habitat requirements, and any sensitive habitat areas that may be encountered. The program shall emphasize the importance of minimizing disturbance, and describe the federal, state, and local regulations protecting biological resources and the potential penalties for non-compliance with these laws and statutes.

Equipment Staging - All construction equipment, staging areas, materials and personnel shall be restricted to existing roadways and road shoulders, designated work areas, or previously disturbed off-site areas that are not habitat for special-status species.

Site Cleanliness - All trash and food items shall be contained and removed from the site regularly to prevent attracting predators and scavengers, such as dogs, coyotes, desert kit fox, or common ravens, to the Project area.

Hazardous Waste Cleanup - Any spills of petroleum products or other chemicals, which may represent a hazard to wildlife, shall be cleaned up promptly and in accordance with appropriate laws and regulations.

CULTURAL RESOURCES

CR-1: Cultural Resources Monitoring – The Project site has been identified to have a low to moderate potential of finding significant archaeological resources lacking surface manifestations that may be encountered during Project construction. To lessen the impact of unknown archeological resources, the Agency will develop a Cultural Resources Monitoring and Mitigation Plan prior to start of ground disturbance. This plan will implement part time monitoring by a qualified archeologist and or a Native American Monitor. In the event that project construction activities result in a finding of significant importance, the qualified archeologist may increase the level of monitoring. If no findings occur during the part time monitoring, the archeologist may further reduce or eliminate the monitoring. During a find of a potentially significant archaeological resource, the resource will be inventoried and evaluated to ascertain whether the resource meets the criteria for listing on the California Register of Historical Resources. After the discovery, all work being conducted within the vicinity of the discovery will be halted or diverted away from the site of discovery until a qualified archaeologist can assess the potential significance of the find.

CR-2: Regulation Compliance – The Agency will comply with Health and Safety Code Section 7050.5, CEQA Section 15064.S(e), and Public Resources Code Section 5097.98, which mandate the process to be followed in the unlikely event of an accidental discovery of any human remains in a location other than a dedicated cemetery.

GEOLOGY AND SOILS

GEO-1: SWPPP - To control water and wind erosion during construction and operation of the Project, the Agency will prepare a Stormwater Pollution Prevention Plan (SWPPP) in compliance with the requirements of the National Pollutant Discharge Elimination System (NPDES) Construction General Permit.

GEO-2: Seismic Design - Although the proposed Project has little inherent potential for causing seismic safety effects, the Agency will ensure that all facilities are designed to withstand the anticipated seismic forces, consistent with local and State building codes and relevant regulations.

GEO-3: Pipeline Shut Off Valves - The Agency will install shut off valves on major pipelines to minimize the potential for flooding during seismic events.

GEO-4: Groundwater Monitoring Plan - Although the potential for the Project to raise groundwater levels to within 30 to 50 feet of the ground surface is small, to address potential impacts to local groundwater levels, the Agency will develop a monitoring program to monitor changes in water levels in the area affected by groundwater recharge operations. If monitoring identifies groundwater level rise to 75 feet below ground surface, the Agency will modify management of recharge to prevent water levels from rising to levels where liquefaction effects could occur. The Groundwater Monitoring Plan will also include provisions for monitoring of groundwater quality and the development of a native groundwater quality baseline which would be identified prior to commencement of recharge operations.

HAZARDS AND HAZARDOUS MATERIALS

HAZ-1: Spill Prevention Plan - Consistent with Agency's existing practices, the Agency will require from its construction contractors the preparation and implementation of a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities and operations. The plan and methods shall be in conformance with all State and Federal regulations. The Agency shall provide for routine inspection of the construction and operations areas to verify that the measures specified in the SPCCP are properly implemented and maintained and further ensure that contractors are notified immediately if there is a noncompliance issue and will require compliance.

HAZ-2 : Bird Strike Hazard Notification - The Agency will notify the Flight Safety Office at Edwards Air Force Base and all local airports of the potential bird strike hazard as follows:

- Prior to application of water to the recharge basins, and
- If large birds or large concentrations of small birds are observed in or near the recharge area.

HAZ-3: Bird Strike Hazard Minimization Measures - The Agency will implement actions to reduce the attractiveness of the recharges basins to birds by:

- Use of recharge basins with shallow water depths which will be generally unsuitable for the larger migratory birds,
- Monitor recharge area water and if aquatic macroinvertebrates are found to be developing in large numbers and/or foraging by shorebirds is observed, temporarily dry out recharge areas, thereby reducing the insect and aquatic macroinvertebrate forage that would attract and hold shorebirds.
- Whenever water is present in the recharge basins, the project operator will monitor the basins daily for bird activity and if found discourage their use via means acceptable to the Department of Fish and Game.

HAZ-4: Mosquito Borne Disease Minimization Measures – The Agency will consult with the Antelope Valley Mosquito and Vector Control District to develop and implement a mosquito management plan. The plan would consist of a Project specific mosquito abatement program that would include quantitative abatement thresholds. The Agency and/or its representative would monitor mosquito larvae production in the recharge basins, drainages, and distribution. Larvae populations would be tracked using methods and thresholds approved by the Mosquito Abatement District, and suppression measures would be employed when thresholds are exceeded. The primacy mode of suppression would be to monitor for mosquito presence and if mosquito larvae are found, to cycle recharge temporarily so that units of recharge would be dried.

HYDROLOGY AND WATER QUALITY

HWQ-1: Drainage Design - Recharge areas will be constructed so that they will not divert sheet flooding and other runoff away from the recharge areas. This will allow flood water to flow into the recharge areas where flows will be somewhat retarded by the recharge berms. Berms will be designed with berm heights below the calculated flood depth elevations and intended to be sacrificial. Flood flows would enter the site, go through the berms, overtop or destroy the

berms in sequence, and eventually exit the project site along the eastern boundary of the proposed project in a manner similar to pre-project conditions.

HWQ-2: **Stormwater Pollution Prevention Plan (SWPPP)** - To reduce or eliminate Construction related water quality effects, before onset of any construction activities, the Agency or its contractor will prepare a Storm Water Pollution Prevention Plan. The SWPPP will include temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover). These measures will be employed to control erosion from disturbed areas. Measures for the control of pollutants during construction include:

- Use of existing access points to minimize dust and tracking materials onto Public Streets,
- Designated Parking, Storage, and Service Areas protected by silt fence and oil absorbents and sloped to control drainage,
- Minimize diesel storage,
- Stockpile spill cleanup materials,
- Regular vehicle inspection for leaks.
- Fuel off-channel with a secondary containment system for spills,
- Use quick connects whenever possible,
- Fueling by authorized personnel only, and
- Spill cleanup materials readily available.

The SWPPP shall include a Fugitive Dust Control Plan (FDCP) that will include extensive measures to control and manage soil erosion. The FDCP will provide for management of open soils that will contribute to management of runoff.

Consistent with the SWPPP and the Agency's current construction management practices, the Agency or its agent will perform routine inspections of the construction area to verify that the BMPs specified in the SWPPP are properly implemented and maintained. The Agency will notify its contractors immediately if there is a noncompliance issue and will require compliance.

HWQ-3: Spill Prevention Plan - Consistent with Agency's existing practices, the Agency will require from its construction contractors the preparation and implementation of a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities and operations. The plan and methods shall be in conformance with all State and Federal regulations. The Agency shall provide for routine inspection of the construction and operations areas to verify that the measures specified in the SPCCP are properly implemented and maintained and further ensure that contractors are notified immediately if there is a noncompliance issue and will require compliance.

HWQ-4: Protection of Off Site Wells. To address potential impacts to groundwater and adjacent well owners, the Agency will develop a monitoring program to monitor changes in water levels and well production in the area affected by groundwater recharge operations. The program will specify that:

- Extractions of groundwater shall not exceed 90% of the amount of water recharged,
- Water quality in recovered water and in groundwater flowing away from the Project will be monitored to ensure that water quality remains appropriate for designated beneficial uses,

- During recharge operations, water levels will be monitored and recharge operations will be suspended in the event that offsite water levels rise to within 75 feet of the ground surface, and
- During recovery operations, water levels in offsite wells will be monitored and operations will be adjusted if offsite wells are found to be adversely affected by project operations,

HWQ-5: Management of Herbicides and Pesticides - The Agency will comply with all regulations of the California Department of Pesticide Regulation regarding the use of herbicides and pesticides in areas designated for groundwater recharge.

NOISE

NOISE-1: Construction Noise Monitoring and Minimization Measures – The Agency and its construction contractors will monitor noise levels for construction activities near and along 280th Street West corresponding to the eastern boundary of the proposed Project area which includes potential noise receptors (residential homes). In the event that noise levels exceed the County of Los Angeles designated thresholds, the construction contractor will implement noise reduction measures to include:

- Providing construction equipment with sound control devices.
- With the exception of well drilling operations, restrict construction activities to day time hours.
- In the event that construction activities occur close to sensitive noise receptors, implementing appropriate additional noise mitigation measures, including but not limited to:
    - Changing the location of stationary construction equipment,
    - Shutting off idling equipment,
    - Rescheduling construction activity
    - Notifying adjacent residents in advance of construction work, and
    - Installing acoustic barriers around stationary construction noise sources.

NOISE-2: Operation Noise Minimization Measures – The Agency proposes to construct approximately 7 groundwater wells in the vicinity of 280th St. West which have the potential to increase the ambient noise level for the nearby residential homes on the east side of 280th St. West during groundwater recovery operations. The Agency proposes to equip these wells with insulated well enclosures that will reduce the operational noise level in the area to less than significant.

TRIBAL CULTURAL RESOURCES

TCR-1: Inadvertent Finds –

1. If human remains or funerary objects are encountered during any activities associated with the project, work in the immediate vicinity (within a 100-foot buffer of the find) shall cease and the County Coroner shall be contacted pursuant to State Health and Safety Code §7050.5 and that code enforced for the duration of the project.

2. In the event that Native American cultural resources are discovered during project activities, all work in the immediate vicinity of the find (within a 60-foot buffer) shall cease and a qualified archaeologist meeting Secretary of Interior (SOI) standards shall be hired to

assess the find. Work on the other portions of the project outside of the buffered area may continue during this assessment period. Additionally, San Manuel Band of Mission Indians will be contacted if any such find occurs and be provided information and permitted/invited to perform a site visit when the archaeologist makes his/her assessment, so as to provide Tribal input.

3. If significant Native American historical resources, as defined by CEQA (as amended, 2015), are discovered and avoidance cannot be ensured, an SOI-qualified archaeologist shall be retained to develop an cultural resources Treatment Plan, as well as a Discovery and Monitoring Plan, the drafts of which shall be provided to San Manuel Band of Mission Indians for review and comment.

    a. All in-field investigations, assessments, and/or data recovery enacted pursuant to the finalized Treatment Plan shall be monitored by a San Manuel Band of Mission Indians Tribal Participant(s).
    b. The Lead Agency and/or applicant shall, in good faith, consult with San Manuel Band of Mission Indians on the disposition and treatment of any artifacts or other cultural materials encountered during the project.

UTILITIES AND SERVICE SYSTEMS

UTIL-1: Electrical Service Upgrade Minimization Measures – In the event that the existing electrical grid system needs to be expanded to meet the proposed project demands, the Agency will require that the Electric Company comply with all mitigation measures identified in this Initial Study during the construction of the expansion.

Appendix D
Cultural Resources Evaluation

CRM TECH
1016 E. Cooley Drive, Suite A/B
Colton, CA 92324

September 4, 2021

Compass Consulting Enterprises, Inc.
PO Box 2627
Avalon, CA 90704
Julie Gilbert, Principal

RE: Report of Review of Project Design Changes Potential to Impact Cultural Resources
High Desert Water Bank Project
Antelope Valley – East Kern Water Agency
Northwestern Los Angeles County

CRM Tech is pleased to present this analysis of the revised site design for the High Desert Water Bank (HDWB) Project and its potential impact on cultural resources.

BACKGROUND

An Archaeological Phase 1 Cultural Resource Assessment was completed for the project, as it was designed at that time, in 2017 (AECOM 2017). During their cultural resource investigation, AECOM found that there are two isolates and the four sites within the project area. AECOM, however, further determined that these cultural resources are not eligible for listing in the California Register of Historical Resources and that they do not meet CEQA criteria for uniqueness (AECOM 2017:38).

Based on the results of all research procedures for the Phase 1 archaeological assessment for the project area, AECOM determined that there is a "low-moderate" potential that archaeological resources will be encountered during earth-disturbing activities for the project, but that such a possibility still exists (AECOM 2017:41). Based on this consideration, AECOM recommended that a monitoring mitigation plan that included part-time archaeological and Native American monitoring be developed and implemented for the project (AECOM 2017:41-42).

Based on, and in agreement with, the information, conclusions, and recommendations of the 2017 Phase 1 cultural resource assessment, CRM TECH developed the recommended monitoring mitigation plan for the project, as it was designed at the time (Hogan 2020). Because none of the known, recorded sites within the project area are considered "significant" cultural resources and because the project area appears to have a "low-moderate" potential that archaeological resources will be encountered during earth-disturbing activities for the project, the Cultural Resources Monitoring and Mitigation Plan recommends that the monitoring program begins with part-time/"spot-check" monitoring during earth-disturbing construction activities for the project. These periodic "spot-checks" could be increased or decreased in frequency depending on the rate and type of soil disturbance, the types of soils being disturbed, and what types of cultural resources are being impacted (Hogan 2020:5).

PROJECT UNDERSTANDING

In 2021, the design of the HDWB project was revised. As a result of the new, current design plans include different areas of excavation for recharge basins than previously proposed, there are changes in the number and locations of the recovery pipelines and recovery wells, and the linear feet of underground pipelines has been increased.

METHODS

To determine if the revised project plans increased or altered the project's potential impact on significant cultural resources, CRM TECH reviewed the revised design plans, the Phase I cultural resource assessment report, and the records of the previously recorded resources, including the locations of all potential historical sites, isolates, and potential Native American sacred sites. CRM TECH also reviewed the Cultural Resources and Tribal Cultural Resources sections of the Initial Study, especially the Mitigation Measures section, to determine if additional mitigation was necessary as a result of the design changes. No field work was deemed necessary.

CONCLUSION

The revised design for the HDWB project does not change the cultural sensitivity of the project area. The cultural resources known to be present within the project area are not "significant" cultural resources. As such, impacts to them are not considered significant impacts to the environment.

Based on these considerations, the changes in the project design do not require any changes to the Mitigation Measures set forth in the original Initial Study sections regarding Cultural and Tribal Cultural Resources or the Cultural Resources Monitoring and Mitigation Plan that was developed for the project in 2020 (Hogan 2020). As before, an initial monitoring program consisting of "spot-checking" the earth-disturbing activities should be implemented for the new design. These periodic "spot-checks" could be increased or decreased in frequency depending on the rate and type of soil disturbance, the types of soils being disturbed, and what types of cultural resources are being impacted. If and when cultural resources are encountered, the archaeologist will halt and divert work in the immediate area and initiate procedures so that the resource can be protected, preserved, and evaluated, as described in the existing Cultural Resources Monitoring and Mitigation Plan.

Do not hesitate to contact our office if you have any questions or would like additional information.

Cordially,

Michael Hogan, Ph.D.
Principal
CRM TECH

References Cited:

AECOM
2017 Archaeological Phase I for the High Desert Water Bank Project, Los Angeles County, California. Report provided by the Client.

Hogan, Michael
2020 Cultural Resources Monitoring and Mitigation Plan for the High Desert Water Bank Project, Los Angeles County, California. On file, CRM TECH.

Appendix E
Drainage Evaluation

Stantec

Initial Drainage Evaluation for AVEK-High Desert Water Bank

Final Report

March 1, 2021

Prepared under the supervision of Joseph Long, Professional Civil Engineer in the State of California.

Prepared by:

David T. Phelps, PE
Todd Ramsey, EIT
Elizabeth Simon, EIT

Revision	Description	Author		Quality Check		Independent Review	
0.04	Draft	T Ramsey and E Simon	7/26/20	D. Phelps	8/5/20	Joseph Long	8/20/20
0.05	Draft	T Ramsey	2/20/21	D. Phelps	2/23/21	Joseph Long	3/01/21

INITIAL DRAINAGE EVALUATION FOR AVEK-HIGH DESERT WATER BANK

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Prepared by Todd Ramsey
(Todd Ramsey)

Reviewed by
(David T. Phelps)

Prepared under the supervision of _____, Professional Civil Engineer in the State of California.
(Joseph Long)

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1.0 INTRODUCTION

1.1 GENERAL

The Antelope Valley East Kern Water Agency (AVEK) is developing the High Desert Water Bank (HDWB) located in the westerly limits of Antelope Valley south of Los Angeles County/Kern County line, north of the State Water Project East Branch, east of 300th St. and west of 280th St. near Neenach, California. The proposed water bank development will occupy approximately 1,200 acres consisting of recharge basins, influent conveyance systems, recovery wells and discharge conveyance systems. Ancillary facilities include power distribution, SCADA controls and other support systems.

The project site is situated near the confluence of several discrete watersheds draining portions of the Tehachapi Mountains to the north and the San Gabriel Mountains to the south. During storm events the proposed project area becomes inundated covering significant portions of the site. Flood mitigation improvements will be required to protect the proposed water bank facilities. This document provides an analysis of the hydrologic conditions of the project area, evaluation of flood mitigation measures and recommended site improvements that control on-site flooding without worsening downstream flood conditions.

1.2 LOCATION

The HDWB project is located within Los Angeles County, California, generally 50 miles north of Los Angeles, and 25 miles west of Lancaster. The site improvements are bounded by Avenue A on the north, 280th Street on the east, the California Aqueduct on the South and 300th Street on the west. More specifically, the site is located within Sections 1, 2 and 12 of Township 8 North and Range 12 West and as shown on Figures 1 and 2.

1.3 HYDROLOGIC SETTING

This site receives stormwater runoff from the Tehachapi Mountains to the north, from the San Gabriel Mountains to the south, and from the west, where these two mountain ranges come together. The offsite tributary watershed from the west consists of 42 square miles for Oso Canyon Creek which contains several tributary watersheds. The northern tributary watershed consists of 19 square miles contributing to Pescado Creek and Antelope Canyon Creek. The average offsite watershed elevation is about 3720 feet above MSL. The average existing site elevation is 2960 feet. Vegetative cover on the site area consists of lower mountain grasslands, rangeland brush and various other native vegetation.

1.4 PURPOSE AND SCOPE OF WORK

The purpose of this Technical Memorandum is to document hydrologic methods used and assumptions made to evaluate the existing drainage patterns tributary to the distributary floodway and quantify

magnitudes of flow. The scope of this TM is to document concept drainage improvements required to convey drainage through and/or around the site in support of proposed improvements.

N

0 30,000' 60,000'

1–INCH = 30,000 FT

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Notes:
MAPPING SOURCE:
GOOGLE EARTH 2020

LEGEND:

- US INTERSTATE HIGHWAY
- PAVED HIGHWAY
- COUNTY BOUNDARY
- PROJECT SITE BOUNDARY
- URBAN COMMUNITY

Client/Project
AVEK - HIGH DESERT WATER BANK PROJECT

Stantec Project No. 184031288

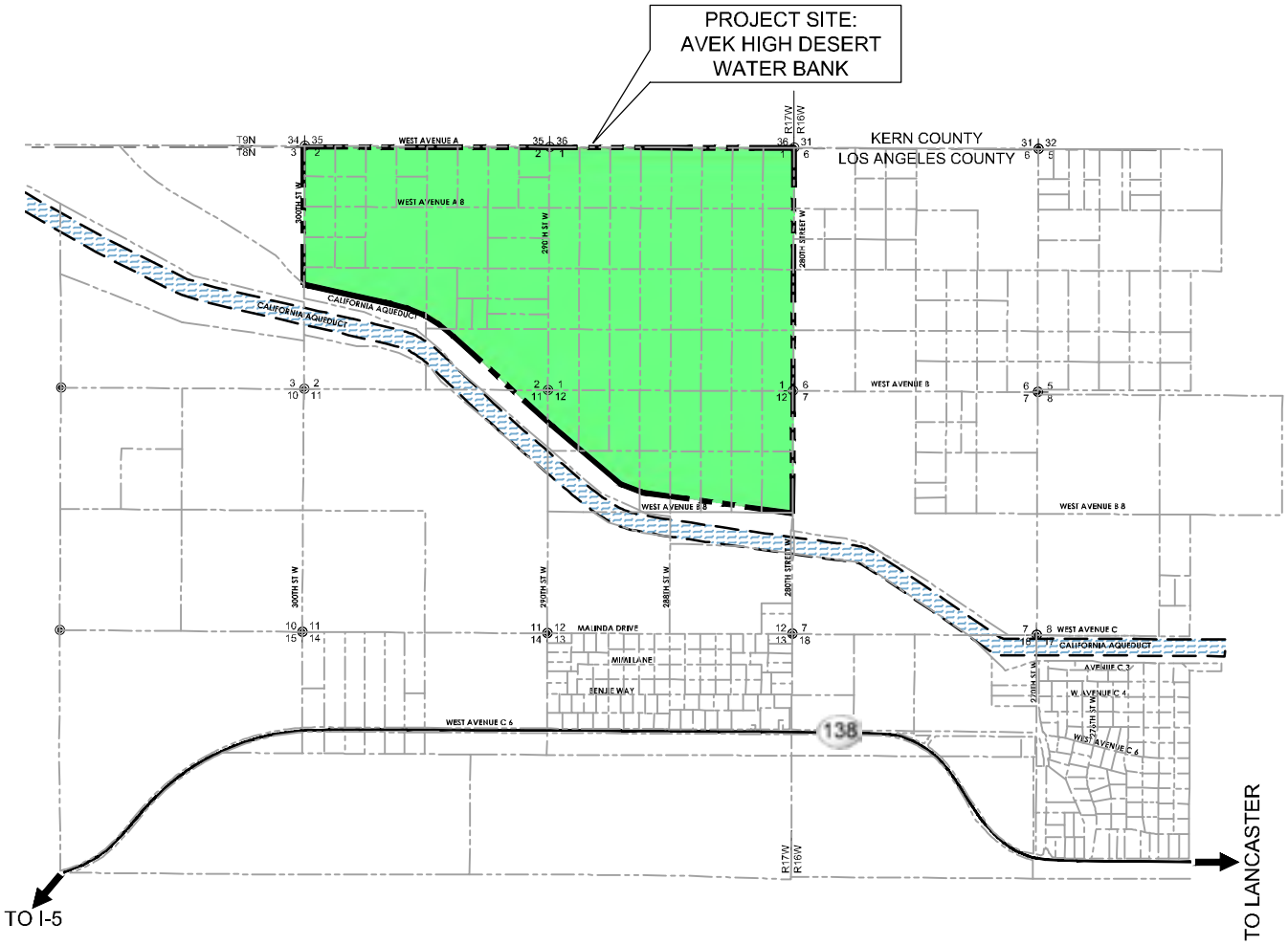
Title
LOCATION MAP

Revision 0.00

Date 2020/08/25

HOIRZ : NAD 83
VERT : NGVD 88

FIGURE 1402



LEGEND:

- PROJECT SITE
- PARCEL BOUNDARY
- USGS SECTION CORNER
- CALIFORNIA AQUEDUCT
- 138 HIGHWAY 138

N

0 4000' 8000'

1-INCH = 4,000 FT

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Client/Project
AVEK - HIGH DESERT WATER BANK PROJECT

Stantec Project No. 184031288

Title
VICINITY MAP

Revision 0.00

Date 2020/8/10

HOIRZ : NAD 83
VERT : NGVD 88

FIGURE 1403

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2.0 FEMA AND FLOODPLAIN DATA

There is a Federal Emergency Management Agency (FEMA) floodplain located across the HDWB site. The proposed site improvements will provide conveyance and containment of these flows through and around the site. No habitable infrastructure is planned for the HDWB project.

The FEMA Flood Insurance Rate Map (FIRM) for the project area is panel 0075 of 2350 (06037C0075F) for Los Angeles County, California and unincorporated areas. The current FIRM of record is dated 09/26/2008, portions of which are reproduced on Figure 3.

The western and northern portions of the flooded area (in blue) is designated as FEMA Flood Hazard Zone A. FEMA Zone A is defined as "Areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies". The eastern portions of the flooded area (purple) are designated as Zone X. FEMA Zone X is defined as "Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from the 1% annual chance flood", with the "areas of 1% annual chance flood with average depths of less than 1 foot" definition being the most applicable at this location. The northern boundary of the site, Avenue A, separates Kern County from Los Angeles county.

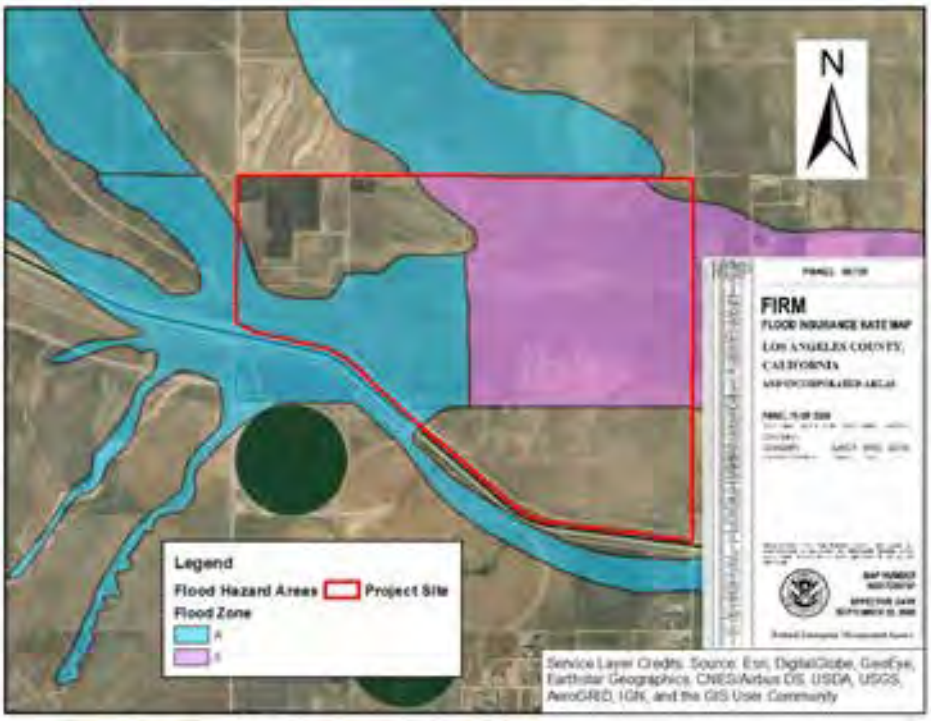


Figure 3 – FEMA Flood Insurance Rate Map

3.0 MAPPING AND SURVEY DATA

The topography used to evaluate this watershed is obtained from the National Oceanic and Atmospheric Association (NOAA) Data Access Viewer. Some of this topographic mapping consisted of LiDAR mapping obtained from https://coast.noaa.gov/dataviewer/#/ and is used to generate DEMs and contours for the basis of the AVEK HDWB watershed evaluation. To fill any mapping gaps, 30-meter raster datasets from the National Elevation Dataset are retrieved from the NRCS/USDA Geospatial Data Gateway: https://datagateway.nrcs.usda.gov/

COORDINATE SYSTEM:

NAD83/92, California State Plane Zone V, as provided by the NOAA data server.

HORIZONTAL AND VERTICAL CONTROL:

NAD 83 horizontal and NAVD 88 vertical.

4.0 DATA COLLECTION AND REVIEW

Several sources of data are used to compile information for the project area; these include the following.

United States Geological Survey (USGS)

- LiDAR survey data produced by USGS and obtained via the NOAA Data Access Viewer
    - 2016 USGS LARIAC LiDAR
    - 2018 USGS LiDAR: Southern CA Wildfires
- Stream gauge data from StreamStats website, https://streamstats.usgs.gov/ss/, as well as regression equations from *Scientific Investigations Report 2012-5113: Methods for Determining Magnitude and Frequency of Floods in California, Based on Data through Water Year 2006*.
- Quadrangle sheets via ArcGIS base map feature

Land use description, 1987 Report United States Department of Agriculture (USDA)

Soil data for regions of Antelope Valley, Angeles Valley, and Southeastern Kern County, obtained via the NRCS Web Soil Survey - https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htmNational Oceanic and Atmospheric Administration (NOAA)

- Rainfall point precipitation estimates for 2, 5, 10, 25, 50, and 100-year storm events, obtained via Atlas 14 Precipitation Frequency Data Server - https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html

National Resources Conservation Service (NRCS)

- Topographic information: 30-m digital elevation model (DEM) rasters from the National Elevation Dataset (NED) for portions of the study area, obtained via the NRCS/USDA Geospatial Data Gateway

5.0 HYDROLOGIC ANALYSIS

5.1 METHODOLOGY AND SOFTWARE SELECTION

Hydrologic analysis is completed using U.S. Army Corps of Engineers (USACE) Hydrologic Engineering Center Hydrologic Modeling System (HEC-HMS) in the upland steep-slope areas and River Analysis System (HEC-RAS) to estimate two-dimensional flow over the flatter braided network areas. ArcGIS is used for geographical calculations and mapping. USDA Technical Release 55 (TR-55) methodology is utilized to calculate time of concentration values subsequently used in the HEC-HMS model. Rainfall-on-grid is applied to the flatter areas when estimating rainfall-runoff using HEC-RAS 2D. A hydrology map is included in Appendix A.

Developed and maintained by the USACE, HEC-HMS and HEC-RAS are widely accepted models for hydrologic analysis incorporating a variety of calculation methods and routing options. HEC-HMS features a completely integrated work environment including a database, data entry utilities, computation engine, and result reporting tools. The components of HEC-HMS include a basin model, meteorological model, and control specifications. HEC-HMS software does not have constraints on watershed size or time of concentration.

HEC-RAS is only capable of one-dimensional hydraulic modeling at the time of its first release in 1995, after being converted from HEC-2 by the United States Army Corps of Engineers (USACE). In February 2016, HEC-RAS version 5.0.0 incorporated two-dimensional modeling capabilities. Instead of being limited to a river reach and cross-sections, topography datasets in the form of geotiffs can be imported and associated with the HEC-RAS geometry file. When using the geotiff datasets, a computational mesh boundary can be established along with inflow and outflow boundary condition lines set along the edge of this flow area to better model overland flow. Flat, alluvial basins, such as the lower basin surrounding the AVEK project site, are an ideal application for two-dimensional flow modeling.

Due to the nature of the project area and size of watershed, which includes portions of Los Angeles County and Kern County, rainfall runoff models assembled using HEC-HMS and HEC-RAS are recommended as the most suitable method to estimate rainfall/runoff response for this study. As mentioned above, TR-55 methodology is used in conjunction with HEC-HMS to define watershed input parameters.

Rainfall depth-area ratios from NOAA Technical Report NWS 24 (NWS-24) are considered as an additional model input parameter. However, due to the shape of the watershed, the more conservative approach of not area reducing rainfall input is selected for this project.

Rainfall-runoff hydrographs produced by the HMS model are extracted at most of the mountain basin concentration points. A two-dimensional flow model domain is established in HEC-RAS, bounded by the mountain subbasins modeled in HMS, and encapsulating the lower, flatter basin containing the project site. Figure 4 illustrates the portion of the watershed that is modeled in HEC-HMS and the portion

modeled using HEC-RAS. The HEC-RAS Model domain overlaps the subbasins at some locations, generally for the purpose of establishing a better placement for the inflow boundary condition lines.

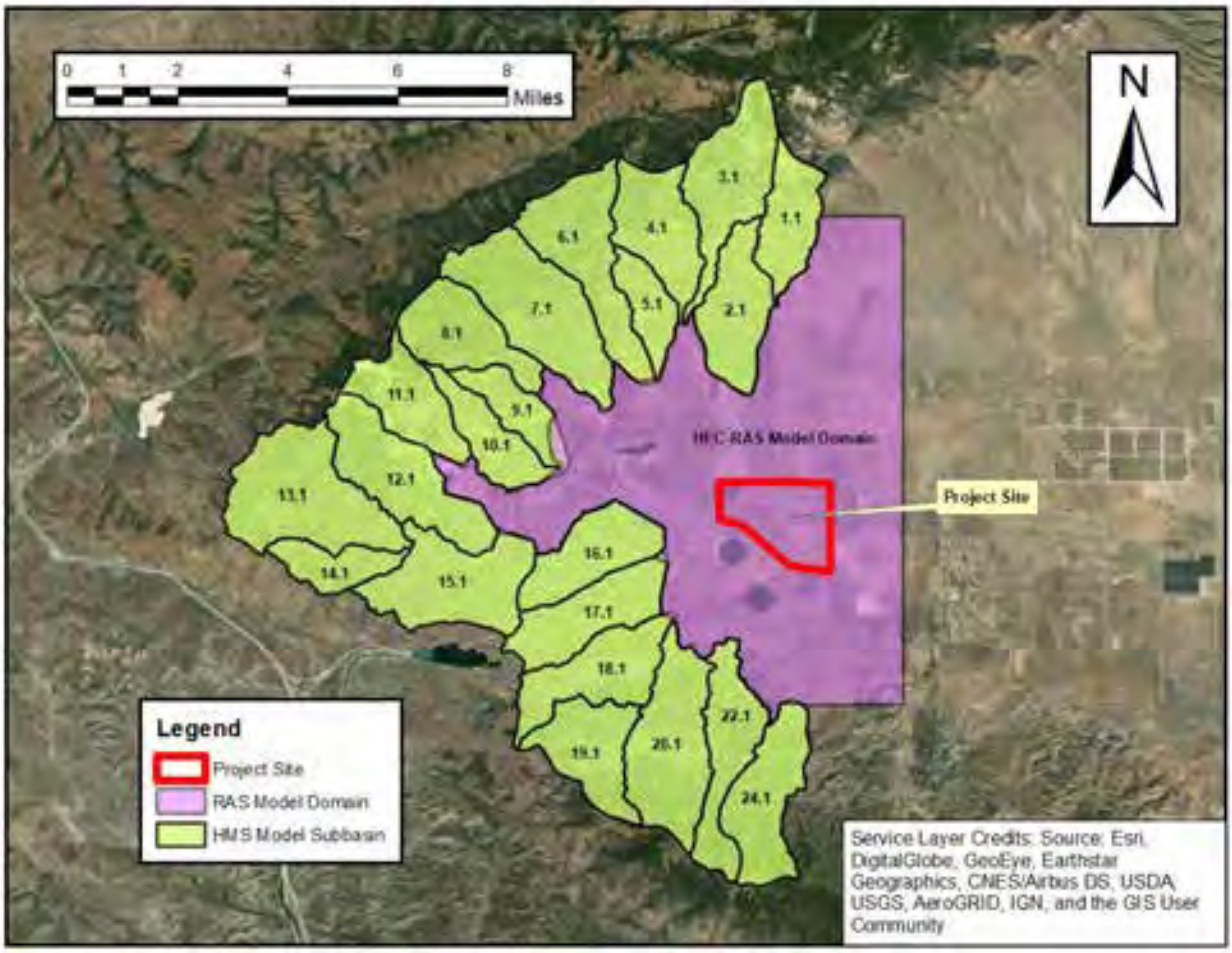


Figure 4 – Hydrologic Model Setup

5.2 WATERSHED PARAMETER ESTIMATION

Watershed parameters assigned to the hydrologic model are ascertained from the data sources described above and estimated as indicated below.

5.2.1 Watershed Delineation

The overall watershed is delineated using digital elevation maps (DEMs) assembled from LiDAR data obtained from the NOAA Data Access Viewer. (https://coast.noaa.gov/dataviewer/#/). The DEMs are assembled into the form of a raster image with a three-foot resolution.

The drainage area of the contiguous watershed is approximately 93 square miles. About half of that area consists of steep mountain subbasins with incised drainage courses. The lower half consists of

distributary alluvial braids that may cross drainage boundaries depending on the rainfall event. As described above and to better estimate the rainfall runoff response of the lower alluvial areas, HEC-RAS 2D is utilized to model the rainfall runoff over these areas, combined with the flows routed from the upper subbasins over the terrain. See Figure 5 - Subbasin Map for a depiction of the subbasins. All watershed area boundaries and calculations are performed by GIS software and verified visually against the contours.

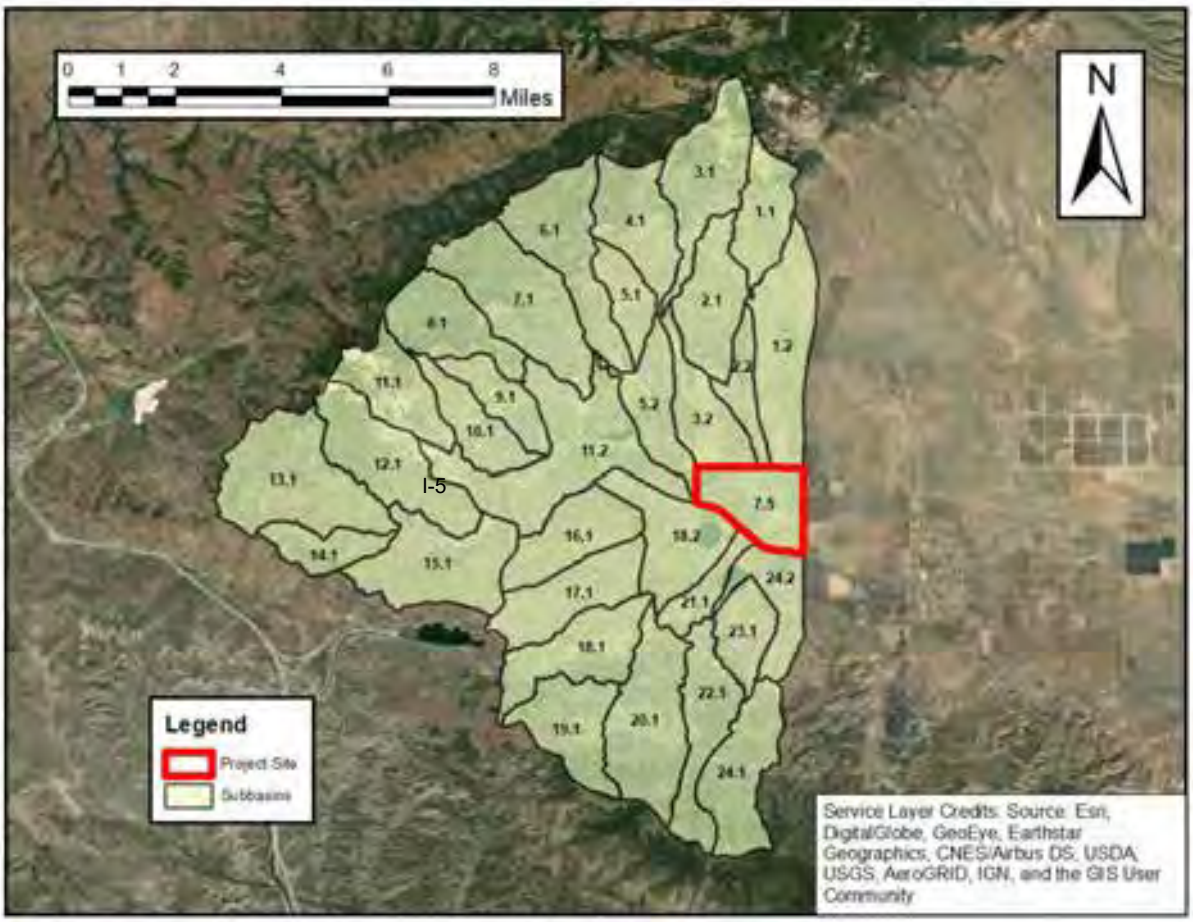


Figure 5 - Subbasin Map

5.2.2 Statistical Parameters

The statistical data available for the watershed consist of point precipitation values as published by the National Oceanic and Atmospheric Association (NOAA) and the Natural Resource Conservation Service. There are no known rain gauges within this watershed. Furthermore, no historic rainfall data is available in this project area.

5.2.2.1 Rainfall Depth and Distribution

The precipitation depth for a given storm can vary widely from one area to another due to the unique topography and climate of the project watershed, specifically the mountain and high desert climates. The decimal-degree 'x' and 'y' coordinates of the centroid of the watershed is computed in GIS and entered on NOAA's Atlas 14 website. The resulting point precipitation-frequency data is then downloaded to obtain the point depths of rainfall over the watershed for the various storm events. This precipitation data is included in Appendix C for review.

A NRCS (formerly SCS) Type 1 temporal distribution is assumed for the 24-hour storm event. In HEC-HMS, the meteorological models for the various storm events (24-hour: 2-year, 5-year, 10-year, 25-year, 50-year and 100-year storms) are set to use a "Hypothetical Storm", with the "SCS Type I" storm being selected. To account for the rainfall in HEC-RAS – which does not compute infiltration - an SCS Type I excess-runoff hyetograph is produced using the weighted curve number of the full 2D domain along with the point depths of the respective storm events. These hyetographs are then coded as "Precipitation" boundary conditions ("rain-on-grid") in the Unsteady Flow editor window for each storm event. The worksheet used to produce these hyetographs are included in Appendix E.4.

5.2.3 Physical Parameters

The physical parameters defining the hydrologic response of the watershed to rainfall are listed below. Worksheets are developed to calculate these physical parameters according to the methods provided in the CALTRANS Hydrology Manual and the NRCS Technical Release 55 (TR-55). The summary tables for the curve numbers and times-to-concentration are provided in Appendix B, and the worksheets for the curve numbers and times-to-concentration are included in Appendices E.1 and E.2, respectively.

5.2.3.1 Soils Data, Vegetative Cover and Curve Number

The curve number is a numerical value used to determine the expected runoff from the area based on soil type and surface cover. These values are developed using the USDA NRCS Curve Number Method as outlined in TR-55. The curve numbers are assigned based on land use and the Hydrologic Soil Group (HSG) of the underlying soil within the watershed. Soils are classified as having a HSG of "A," "B," "C," or "D," which corresponds to the particular soil's ability to store runoff. Soils of HSG 'A' have the lowest runoff potential, while soils of HSG 'D' have the highest runoff potential.

The project watershed is primarily undeveloped land with significant portions of mountainous and high desert subregions. Research of the area including USGS reports and virtual site walks indicate the area may be characterized as semiarid rangeland with primary cover of desert shrub. The hydrologic condition of the area is characterized as poor, corresponding to less than 30% of the ground being covered by vegetation. These classifications fall in line with the definitions established in TR-55.

Soils information is obtained from the NRCS/USDA Web Soil Survey database. The area-of-interest polygon drawn on the website matched the AVEK watershed extents. The soils shapefile and associated report for this area is downloaded, and the hydrologic soil groups are assigned to each unique soil-type polygon per the report. Figure 6 details the HSG distribution within the watershed, with the primary soil

HSG shown over each area. Some soil mixtures are comprised of a soil type of one HSG and another soil type of a second HSG. In this case, the percentages are normalized to take out the effects of any minor soil-mixture components, and the curve number is calculated taking into account this compound HSG.

It can be observed by inspection of Figure 6 that there is a heavy presence of 'B' and 'C' HSG soils, indicative of moderate runoff potential.

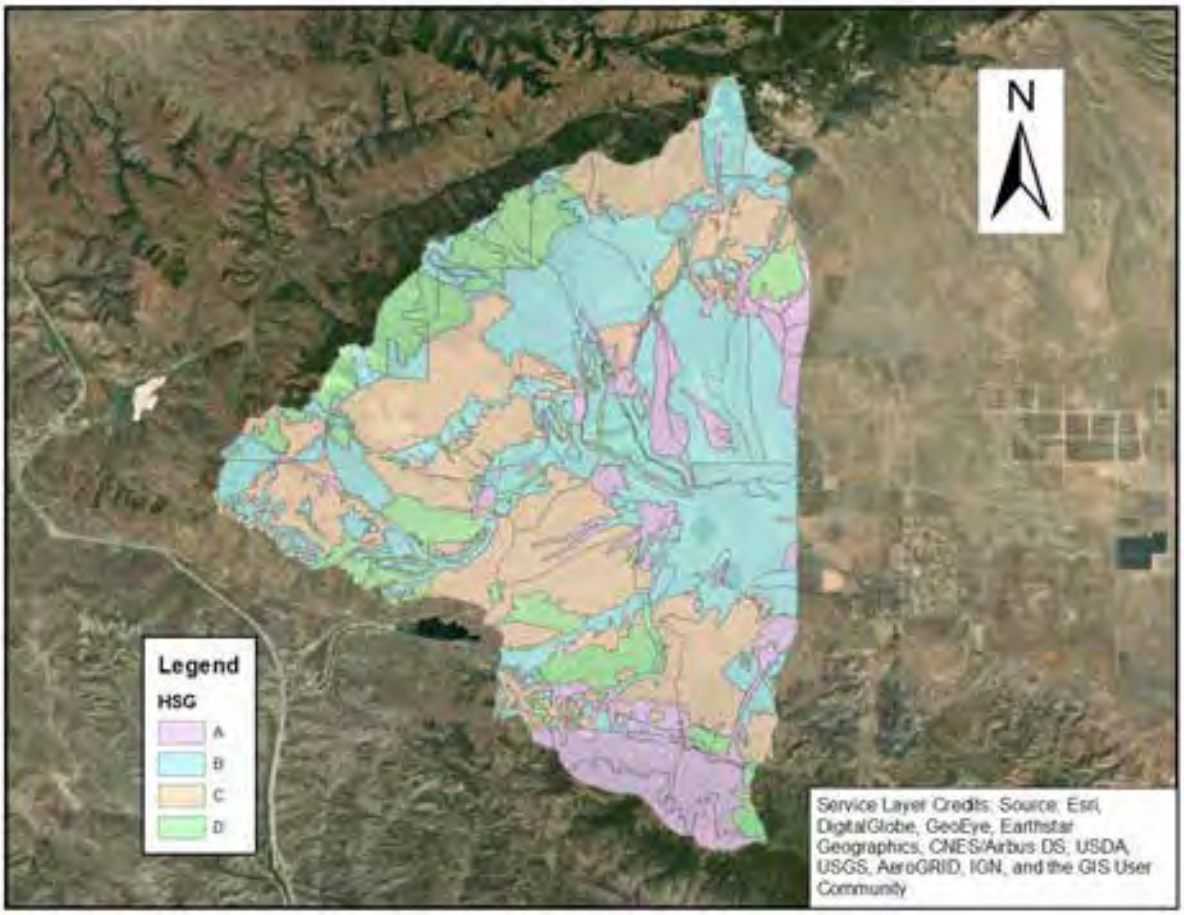


Figure 6 – Soils

Utilizing GIS, the "Intersect" tool is run to combine the soils and subbasins shapefile, and the data from this shapefile exported to Excel. The area-weighted curve numbers are calculated for each subbasin, as well as the area encompassed by the HEC-RAS 2D model domain, for use with the rain-on-grid hyetograph. The curve-number calculation spreadsheet is included in Appendix E.1. The HEC-HMS model subbasin elements had a curve number assigned based on these calculations.

5.2.4 Unit Hydrograph Time of Concentration

Time of concentration (Tc) represents the time required for a drop of water that falls on the most hydrologically remote portion of a watershed to reach the watershed outlet or concentration point located

within the watershed. The NRCS TR-55 method is used to develop the Tc's implemented in the modeling efforts of the project area. This method estimates runoff through a watershed using the concepts of sheet flow, shallow concentrated flow, and open channel flow. Sheet flow is defined as flow over plane surfaces by TR-55. It is usually present near the headwaters of a stream and generally considered applicable for only the first few hundred feet of a stream. Sheet flow lengths are generally limited to 300-ft, per the National Engineering Handbook. Shallow concentrated flow occurs where flow is shallow and unconfined by boundaries of a channel. According to TR-55, open channels flow occurs when channels are identifiable in aerial photographs or indicated on USGS quadrangle sheets.

Due to the size of the watershed and subareas when divided, the methods of calculating Tc by evaluating the time of concentration in the sheet flow, shallow concentrated flow and channel flow regimes are used in combination. Intercept and roughness coefficients are estimated based on research of the area's groundcover. They are incorporated in the Tc calculation via the TR-55 equations and Manning's equation as parameters for the travel times of the three flow regimes. The TR-55 equations are used to calculate the travel time in sheet flow and shallow concentrated flow, while Manning's equation is used to evaluate the travel time in channel flow.

The Tc calculation spreadsheet is included in Appendix E.2. Figure 7 details the flow paths for which the time of concentration is calculated.

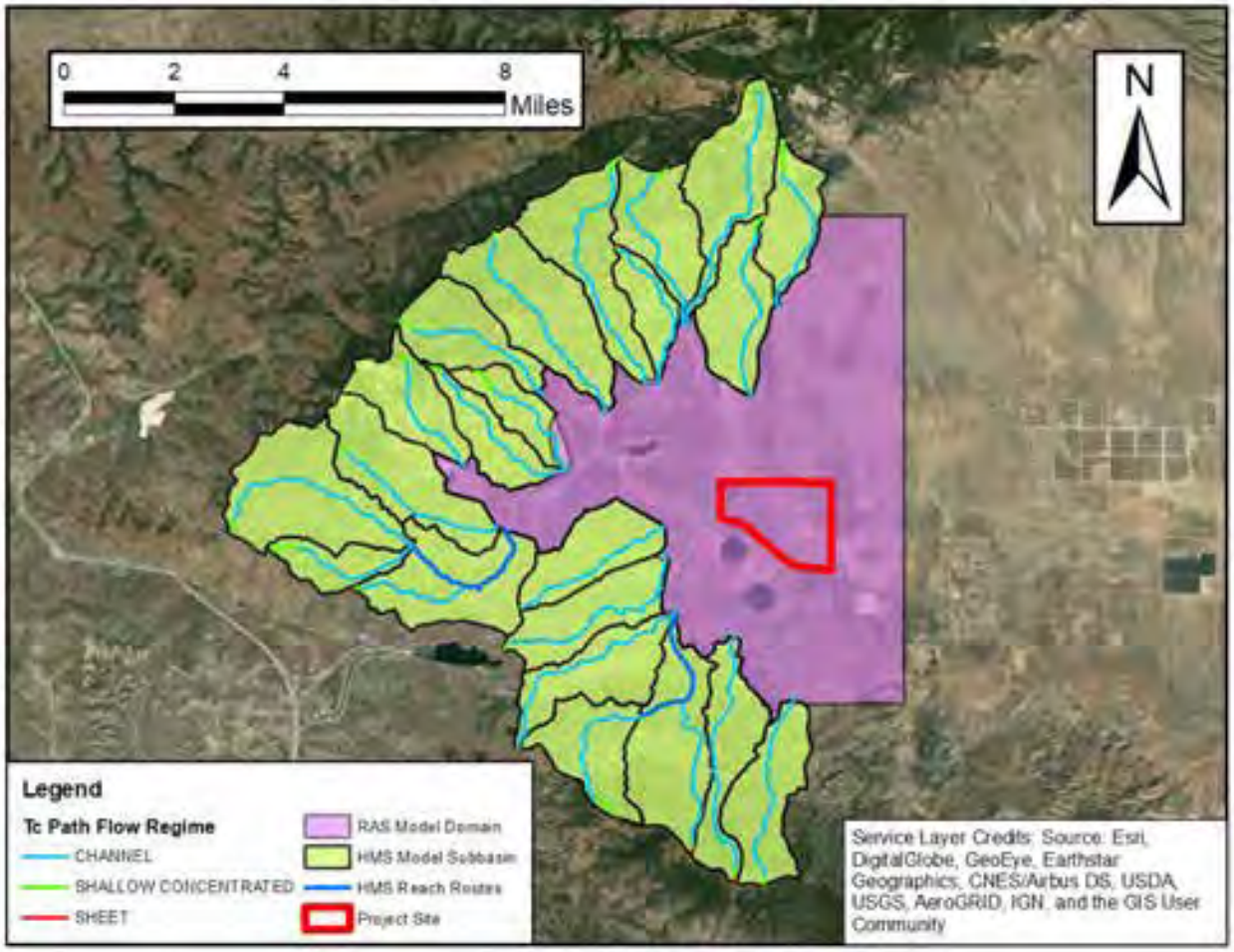


Figure 7 – HEC-HMS Flow Paths

5.2.5 Routing Reaches

Routing reaches are used to translate an upstream hydrograph through the downstream sub-basin to the next hydrologically connected watershed. The reach route lag time entered in HEC-HMS is equal to the total travel time, computed using Manning's equation. The length of the reach route is then divided by the velocity at normal depth to determine the travel time. Position and length of the modeled reaches are determined by analyzing topographic information. All length calculations are performed by GIS software. The calculations for the reach route lag times are included in Appendix E.3.

5.3 HYDROLOGIC MODELING METHOD

After verifying the input parameters in the HEC-HMS basin model, meteorologic models are assembled for 2, 5, 10, 25, 50, and 100-year storm events. In each meteorological model, the SCS Type I storm distribution is selected, and the associated frequency-storm's point depth entered per the NOAA data obtained from Atlas 14. Figure 8 displays the layout of the HMS basin model.

Figure 8 – HEC-HMS Basin Model Layout

The resulting hydrographs at each of the HMS outflow nodes are referred to as 2D "Inflow" nodes. The 2D "inflow" nodes generated in HMS are saved to a series of spreadsheets. Appendix E.5 contains this dataset. These 2D "inflow" hydrographs are then entered into the HEC-RAS Unsteady Flow files, one for each storm. Figure 9 shows the geometry setup of the two-dimensional RAS model.

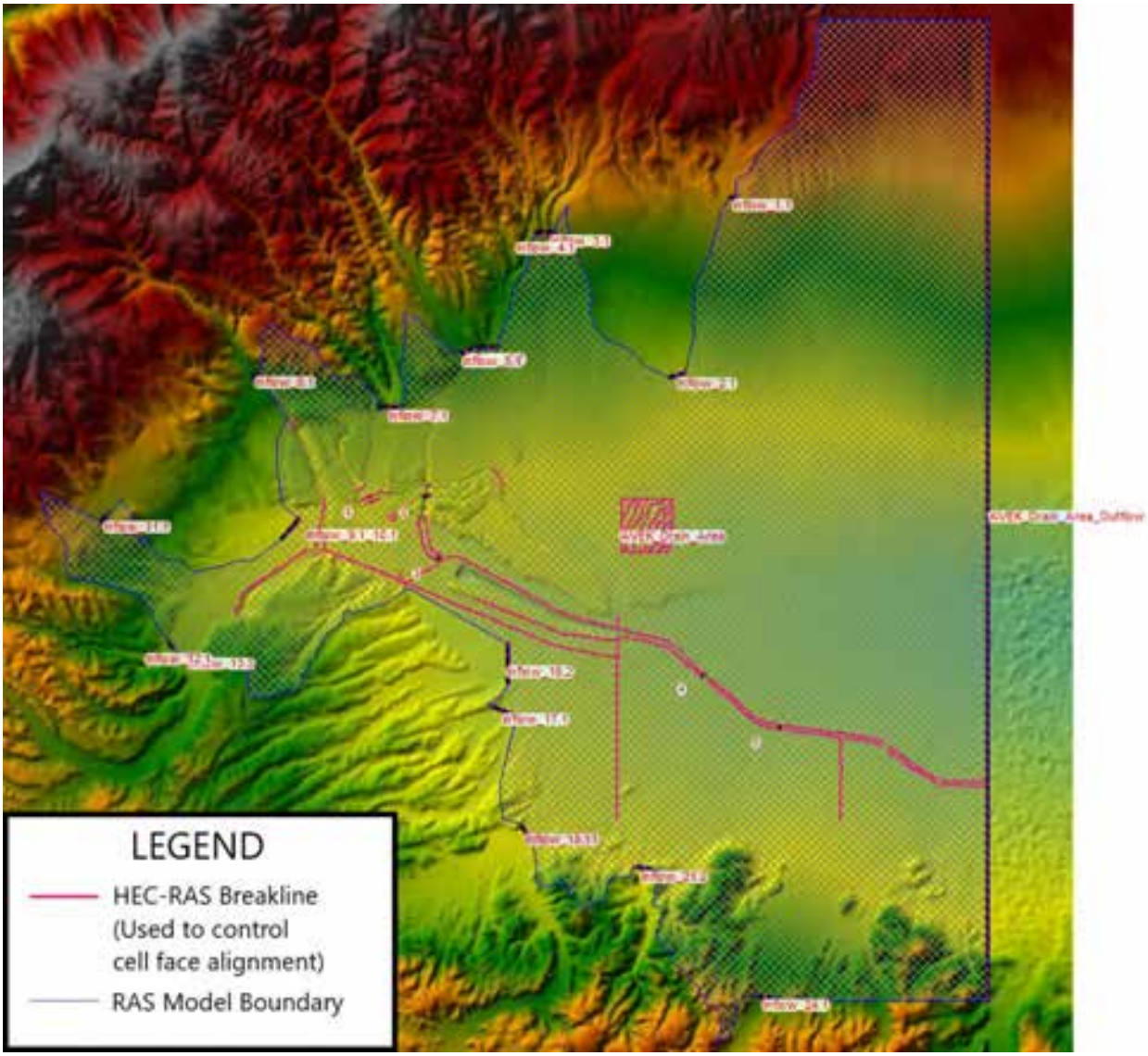


Figure 9 – HEC-RAS Model Geometry Layout

The boundary condition lines along the northern, western and southern boundaries of the RAS domain match up with the HMS outflow (AKA 2D "Inflow") nodes shown on Figure 8. Each one of these lines corresponds to a hydrograph, discussed above, for which the corresponding HMS outflow hydrograph is transferred into HEC-RAS 2D.

As discussed in 5.2.2.1, the precipitation hyetographs for the HEC-RAS rain-on-grid are generated via a spreadsheet (included in Appendix E.4) using the weighted curve number over the 2D domain and the SCS Type I storm distribution.

6.0 HYDROLOGIC RESULTS

6.1 PEAK FLOW RESULTS

Following the computation of the basin modeling for each storm event scenario in HEC-RAS, the results are compiled and tabulated for verification, comparison and reporting measures. The peak flow results are measured in HEC-RAS using RASMapper, a program embedded in HEC-RAS for viewing the results. In RASMapper, profile lines are drawn across the sections-of-interest, and the hydrographs exported for the peak flow and volume accumulations to be calculated via spreadsheet. All of the results for each of the storm event scenarios modeled are located in Appendix D for reference and review. Appendix A (the hydrology map) includes the locations of the concentration points below, as do Figures 13, 14 and 15.

A brief summary of the Hydrologic results produced from HEC-RAS 2D follows in Table 1.

Table 1 Summary of Peak Discharge for each storm event (EXIST / PROP), in cfs

Concentration Point	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
1	3,820 / NC	7,310 / NC	10,540 / NC	14,790 / NC	17,670 / NC	20,110 / NC
2	1,310 / NC	2,770 / NC	4,070 / NC	5,940 / NC	7,370 / NC	8,870 / NC
3	5,130 / NC	10,100 / 10,070	14,630 / 14,570	20,780 / 20,700	25,080 / 24,990	28,910 / 28,810
4	40 / NC	100 / NC	190 / NC	350 / NC	490 / NC	630 / NC
5	0 / 40	0 / 100	0 / 180	0 / 340	0 / 490	10 / 630
6	40 / NC	100 / NC	190 / 180	360 / 340	500 / 470	640 / 620
7	5 / NC	10 / NC	20 / NC	30 / NC	40 / NC	60 / NC
8	650 / NC	1,510 / NC	2,310 / 2,330	3,880 / 3,920	5,210 / 5,250	6,430 / 6,490
9	1,460 / 640	3,170 / 1,490	4,690 / 2,330	6,960 / 3,890	8,590 / 5,250	10,010 / 6,480
10	4,150 / 5,070	8,170 / 10,020	12,180 / 14,560	17,620 / 20,810	21,490 / 25,220	25,000 / 29,170
9 + 10 (total site runoff)	5,610 / 5,710	11,340 / 11,510	16,870 / 16,890	24,580 / 24,700	30,080 / 30,470	35,010 / 35,650

Note: NC = No Change or same as existing conditions

The total rainfall-runoff volume estimated at concentration points 9 and 10 (the major outlet points of the site) for the 100-year storm event is 15,240 acre-feet for existing conditions. This total rainfall-runoff volume is slightly less under proposed conditions – 15,078 acre-feet – due to some storage effects of the site improvements.

Figure 10 shows the maximum depth distribution of existing condition flooding over the project site for the 100-year storm. Figure 11 shows the maximum velocity distribution for the same event.

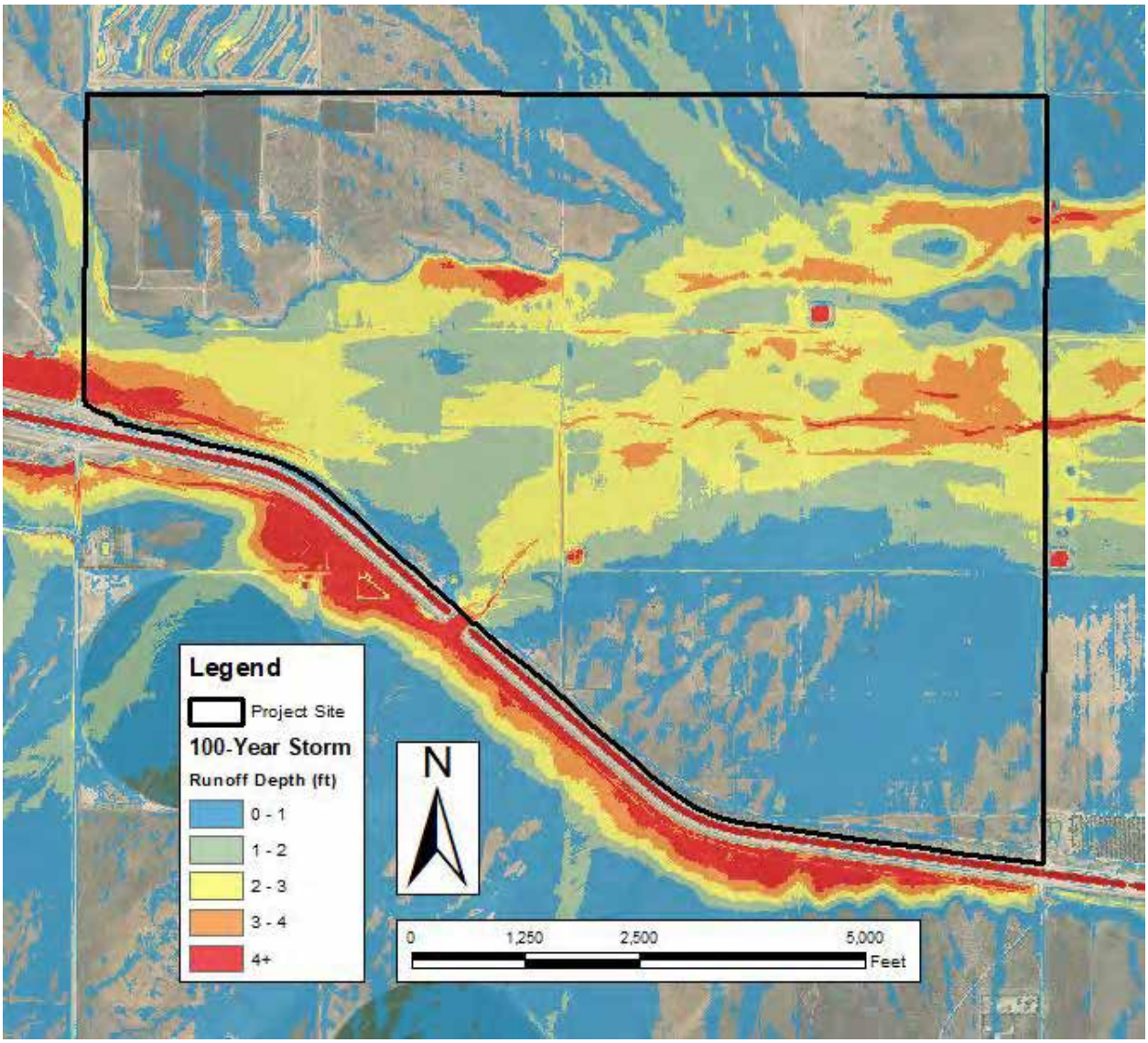


Figure 10 – Project Site 100-Year Existing Conditions Flooding – Maximum Depth

As the flow from the north, west and south directions enters the site, two-dimensional distributary runoff patterns occur. In order to model the impact of any proposed drainage improvements most effectively, it is recommended that HEC-RAS be used along with its two-dimensional modeling capabilities to model the proposed improvements to the site.

The Manning's n roughness coefficient of 0.045 is applied to majority of two-dimensional flow domain areas and is consistent with the firm soil and light amount of vegetation observed in the floodplain. The selected value follows recommendations published in the USGS Water-Supply Paper 2339 (1989).

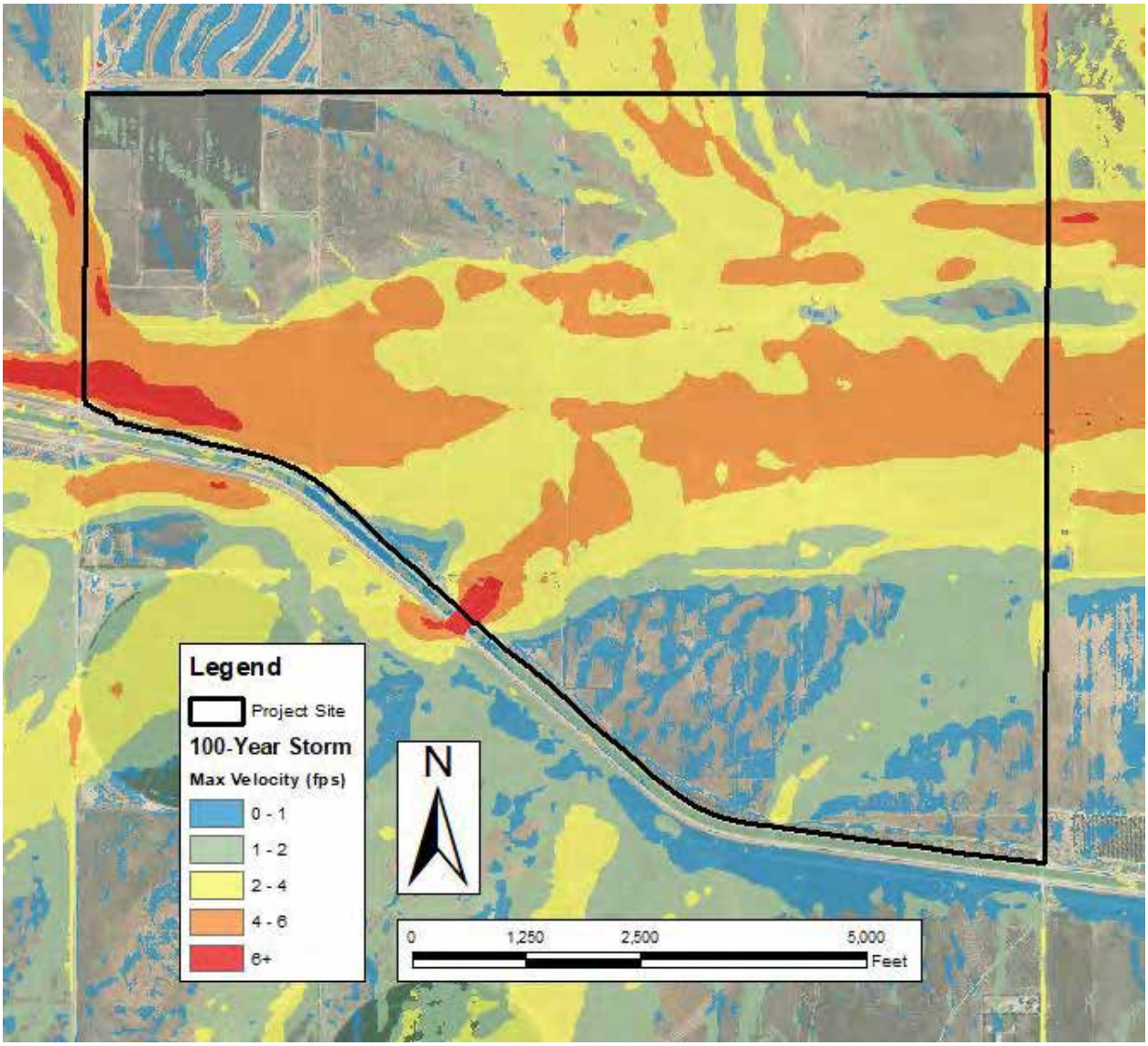


Figure 11 – Project Site 100-Year Existing Conditions Flooding – Maximum Velocity

The depths and velocities shown are the instantaneous maximum depth and velocities at each location. This means that the maximum value at one location might occur at a different time than the time of peak flow velocity at another location. The same is true for Figures 14 and 15, which detail the same information with proposed improvements in-place.

7.0 MODEL VERIFICATION

Although calibration of the HEC-HMS and HEC-RAS 2D modeling are not possible due to a lack of rainfall and/or watershed gauge data, verification of the modeling is possible. Two independent methods of verification are available for this site. The first consists of comparing results against known USGS stream gauges. The second independent verification method is comparison of results against USGS regression analysis using regional flood-frequency equations for rural un-gauged streams in California as indicated in *Scientific Investigations Report 2012-5113: Methods for Determining Magnitude and Frequency of Floods in California, Based on Data through Water Year 2006*.

7.1 VERIFICATION OF SUB-AREAS

The HDWB project area lies within USGS Desert Region 6. There are only two USGS stream gauges located within USGS Desert Region 6. These gauges are about 25 miles away from the HDWB site. The USGS stream gauges are 10264530 Pine Creek (https://nwis.waterdata.usgs.gov/nwis/peak?site_no=10264530&agency_cd=USGS&format=html) near Palmdale, CA and 10264605 Joshua Creek https://nwis.waterdata.usgs.gov/nwis/peak?site_no=10264605&agency_cd=USGS&format=html near Mojave, CA. These gauges have drainage areas of 1.78 sq. mi. and 3.83 sq. mi., respectively.

The USGS Scientific Investigations Report 2012-5113 indicates the following regression equation with one percent annual exceedance probability (100-year storm event) within Region 6. According to the same report, the one percent annual exceedance probability contains an average standard error of 444.3 percent.

$$Q_{100} = 1350(DRNAREA)^{0.506}$$

To determine the applicability of this regression equation for comparison against the USGS stream gauges and, transitively, modeled subareas, flow values are calculated for similar sizes of drainage sub-areas represented by the two selected USGS gauges. These values are indicated alongside flows measured by the USGS stream gauges and flows from selected project subareas of similar scale in Table 2.

Table 2 Subarea Model Comparison: 100-Year Discharge (cfs)

Component	Area (SQ MI)	HEC-HMS Model	USGS Gauges	Regression Model	Regression Model Lower Limit	Regression Model Upper Limit
USGS Gauge # 10264530	1.78	-	457	1,807	332	9,837
USGS Gauge # 10264605	3.83	-	1,190	2,663	489	14,497
HEC-HMS Subarea #10.1	1.93	1,490	-	1,883	346	10,249
HEC-HMS Subarea # 3.1	3.60	2,098	-	2,581	474	14,050

There is very little correlation between flows from the various discharge calculation methods. This is expected since flooding in this area is highly variable for various reasons including large ranges in rainfall patterns, infiltration characteristics, and others. Additionally, according to the USGS Scientific Investigations Report, flood-frequency analysis in the California desert is complicated due to short annual peak-flow records and numerous zero flows and low outliers for many stream gauges. Due to the large standard error associated with the desert regression model, the HEC-HMS results fall within the allowable range. However, the size of the range provides little confidence in comparative value of the regression model results.

7.2 VERIFICATION OF OVERALL WATERSHED

Similarly, a comparison between the regression model predicted discharge for the overall watershed area and the discharge computed with the hydrologic model are included in Table 3. The results show that the hydrologic model discharge is greater than that calculated by the regression analysis, but within the range of its standard error. Given the poor draining soils in the project watershed (heavy presence of soils with HSG C) and general lack of vegetation, a higher runoff value cannot be disputed.

Table 3 Overall Model Comparison: Discharge in cfs for entire watershed (92.62 sq mi)

Storm Event	Model Q (CFS)	Gauge Q (CFS)	Regression Model	USGS STD Error (%)	USGS Upper Limit
100-yr	35,010	N/A	13,350	444.3	72,665
50-yr	30,080	N/A	7,516	356.9	34,339
25-yr	24,580	N/A	3,985	297.6	15,845
10-yr	16,870	N/A	1,493	248.1	5,198
5-yr	11,340	N/A	593	226.2	1,935
2-yr	5,610	N/A	102	214.2	320

8.0 MODELING OF CONCEPT DRAINAGE IMPROVEMENTS

The recommended drainage improvements consist of various compacted berms to contain the stormwater runoff within conveyance corridors at existing grade. To evaluate the impact of these drainage improvements, these features are coded into HEC-RAS. There are two methods to do this (1) embedding the feature into the surface model directly or (2) utilizing the HEC-RAS SA/SD (storage area/two-dimensional) connection lines. The first method (embedding) requires several steps to manipulate and patch the surface DEM with the proposed features. The simplified method of utilizing connection lines with elevated surface to represent compacted berm features provides the same results with less input required.

The simplified method (SA/SD connections) is much more efficient when evaluating multiple alignments and /or berm locations. Figure 12 shows the 3D-polyline patch lines and HEC-RAS connection lines over the existing topography, and Figure 13 shows the proposed topography with the berms in-place, in addition to HEC-RAS berms.

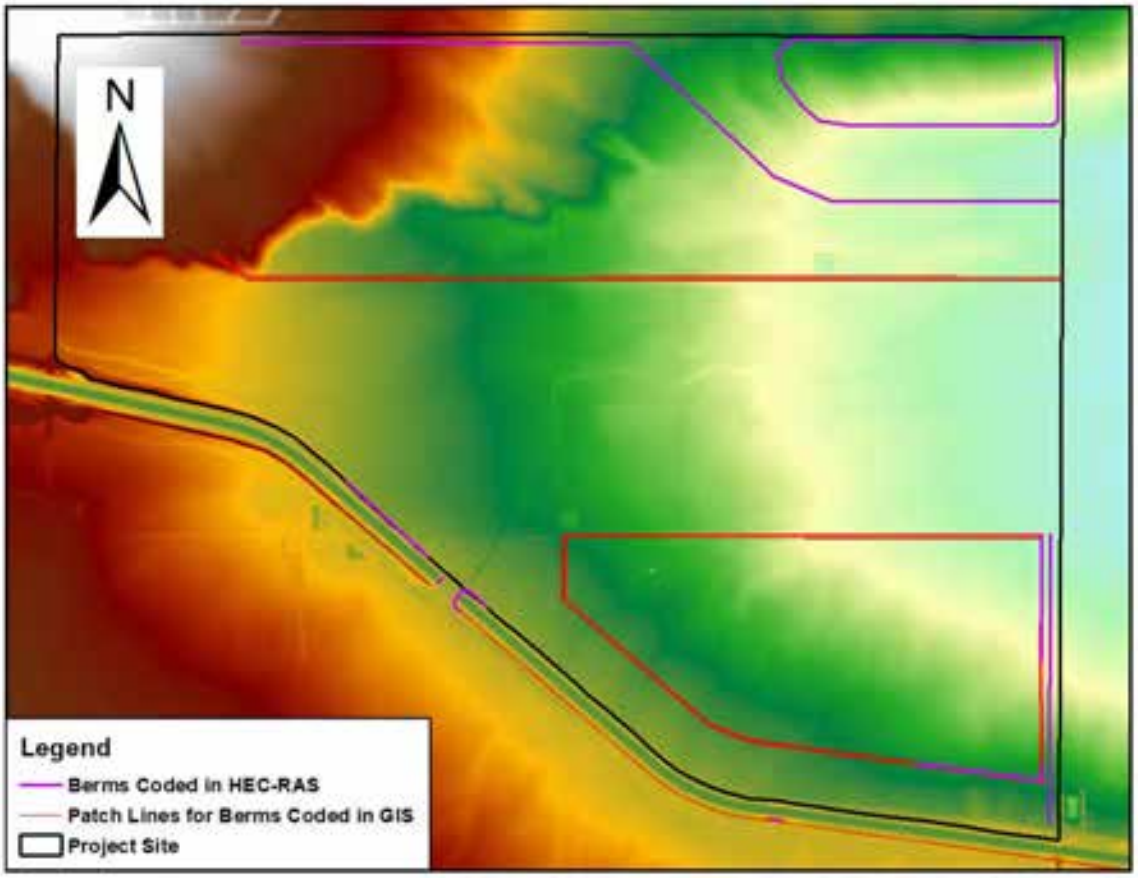


Figure 12 – Berm Patch Linework Over Existing Topography

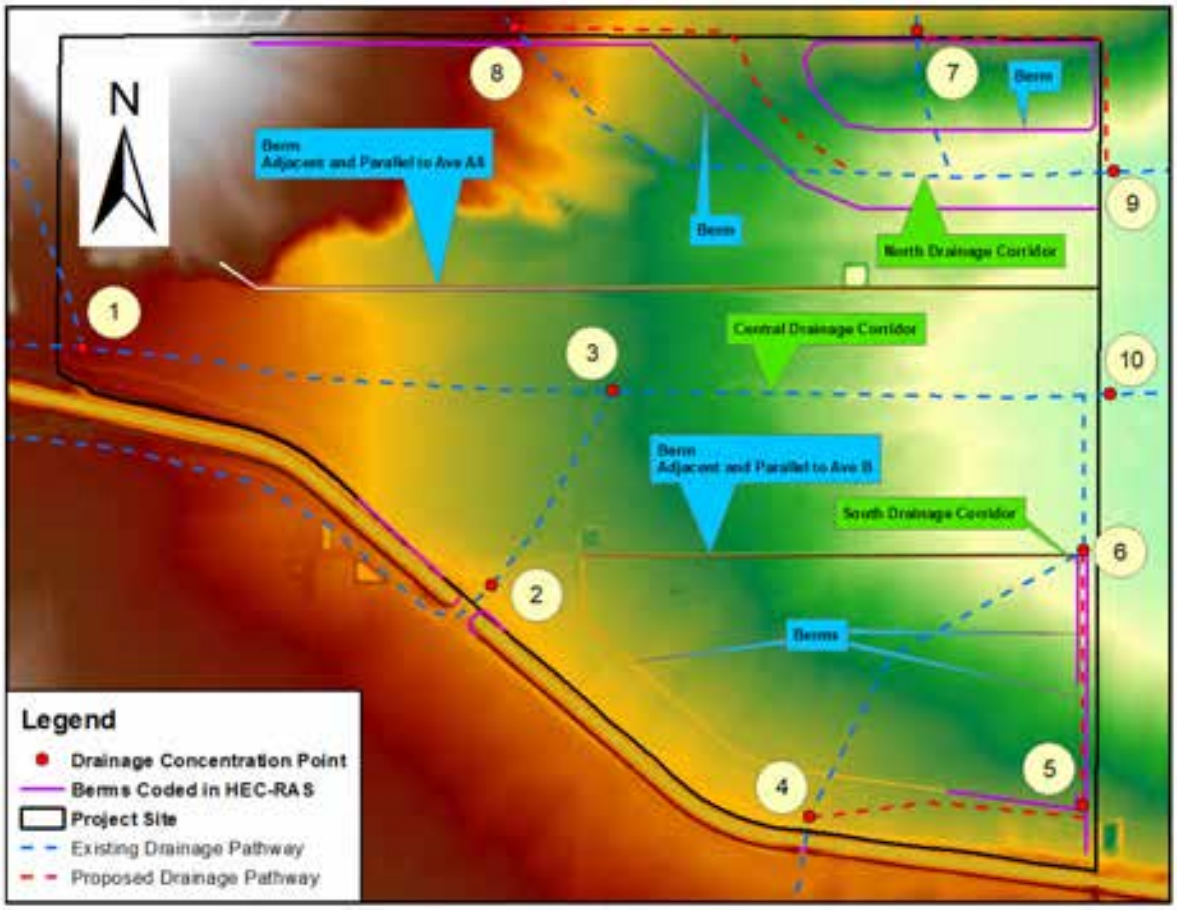


Figure 13 – Proposed Conditions Topography, Berms and Flow Paths

These recommended drainage improvements convey offsite flow through three primary drainage corridors: (1) north, (2) central, and (3) south. The north corridor conveys the flow from Pescado Creek. The central corridor conveys the flow from Oso Canyon Creek and Big Sycamore Canyon Creek. The southern corridor conveys the flow coming from across the canal drainage overchute from the south. All three corridors release flow at their pre-project location.

Referring back to Table 1 (the summary of the site peak discharges), the primary corridor conveys the peak discharge associated with point 3, which takes the flow from points 1 and 2. The northern corridor conveys the peak discharge(s) associated with point 8 to point 9, just downstream of where this flow crosses 280th Street. The relatively small amount of flow associated with point 7 is pushed around the northeastern corner of the site and south to where it combines with the north drainage corridor flow just upstream of point 9. The southern corridor conveys the peak discharge of point 5, which takes the flow coming from point 4. The flow conveyed through the south corridor mixes with the flow in the central drainage corridor beginning just north of Ave. B at point 6. The combined flow then crosses 280th Street at point 10.

The drainage corridor existing invert elevations remain under this recommended improvement scenario. The height of the berms is determined by whichever height is greater between 1) the maximum depth of

runoff plus the necessary freeboard and 2) the height of berm required for recharge operations, when adjacent to flooding corridors.

Figure 14 details the maximum depth distribution for 100-year flooding with the recommended drainage improvements in-place, and Figure 15 details the maximum velocity distribution. It is assumed rainfall runoff accumulation directly on recharge areas will be stored by the recharge basins, or severely lagged in time as it passes through the recharge basin network with a net result of not adding to peak discharge leaving the site.

Similar to existing conditions, a Manning's n-value of 0.045 is applied to the majority of floodplain reaches modeled under the two-dimensional hydraulic domain and the entirety of the project site.

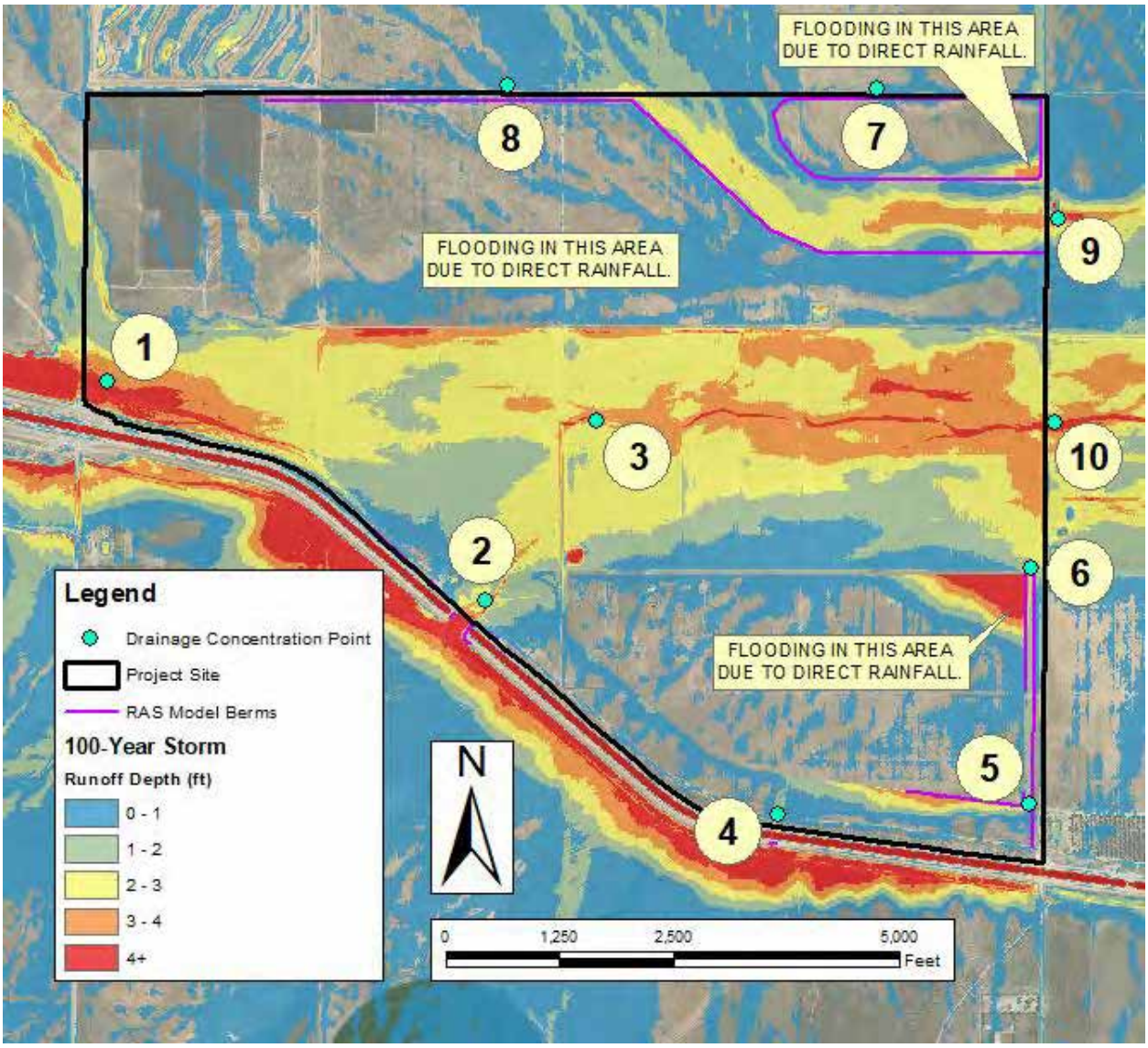


Figure 14 – Project Site 100-Year Proposed Conditions Flooding – Maximum Depth

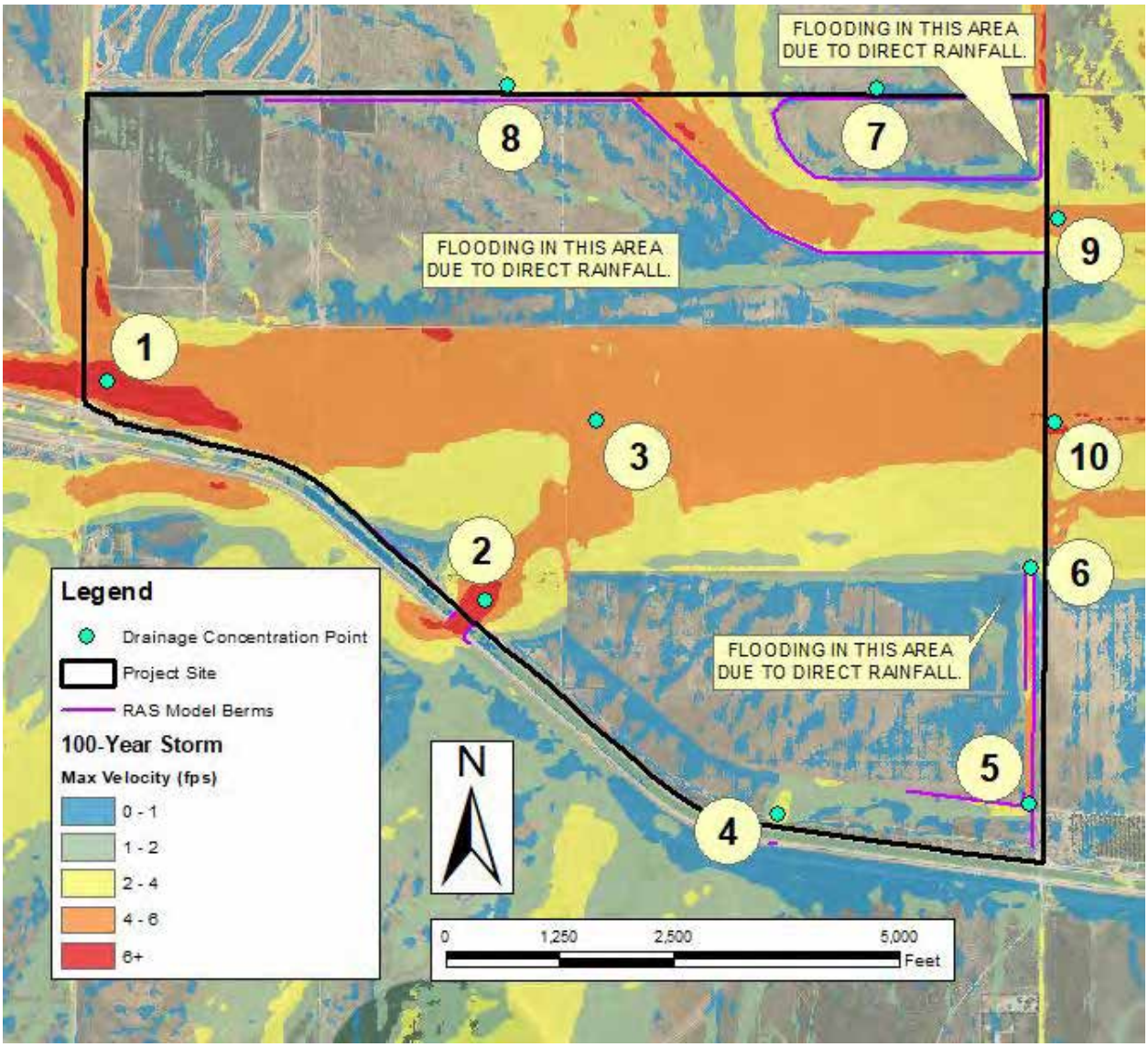


Figure 15 – Project Site 100-Year Proposed Conditions Flooding – Maximum Velocity

Upon comparison of the existing-condition depth and velocity maps to those of the proposed condition – comparing Figure 10 to Figure 14 and Figure 11 to Figure 15 – it is apparent that the confinement of the flow in these three proposed corridors does not result in a substantial increase in depth nor velocity to the point of major concern. The existing flow path alignments are largely maintained to ensure little-to-no impact on any development surrounding the project site. See Appendix D.2 for additional discussion of the HEC-RAS results.

Figure 16, below, shows the locations of cross-sections sampled along the recommended drainage corridor berms. The recommended cross-sections are included in Appendix F. Each section can be identified by the associated letter ID, included in Figure 16 adjacent to each respective cross-section.

The red lines in Figure 16 represent the berm cross-section generalize location are not drawn to scale in terms of length and are show relatively large here to indicate cross-section location more clearly.

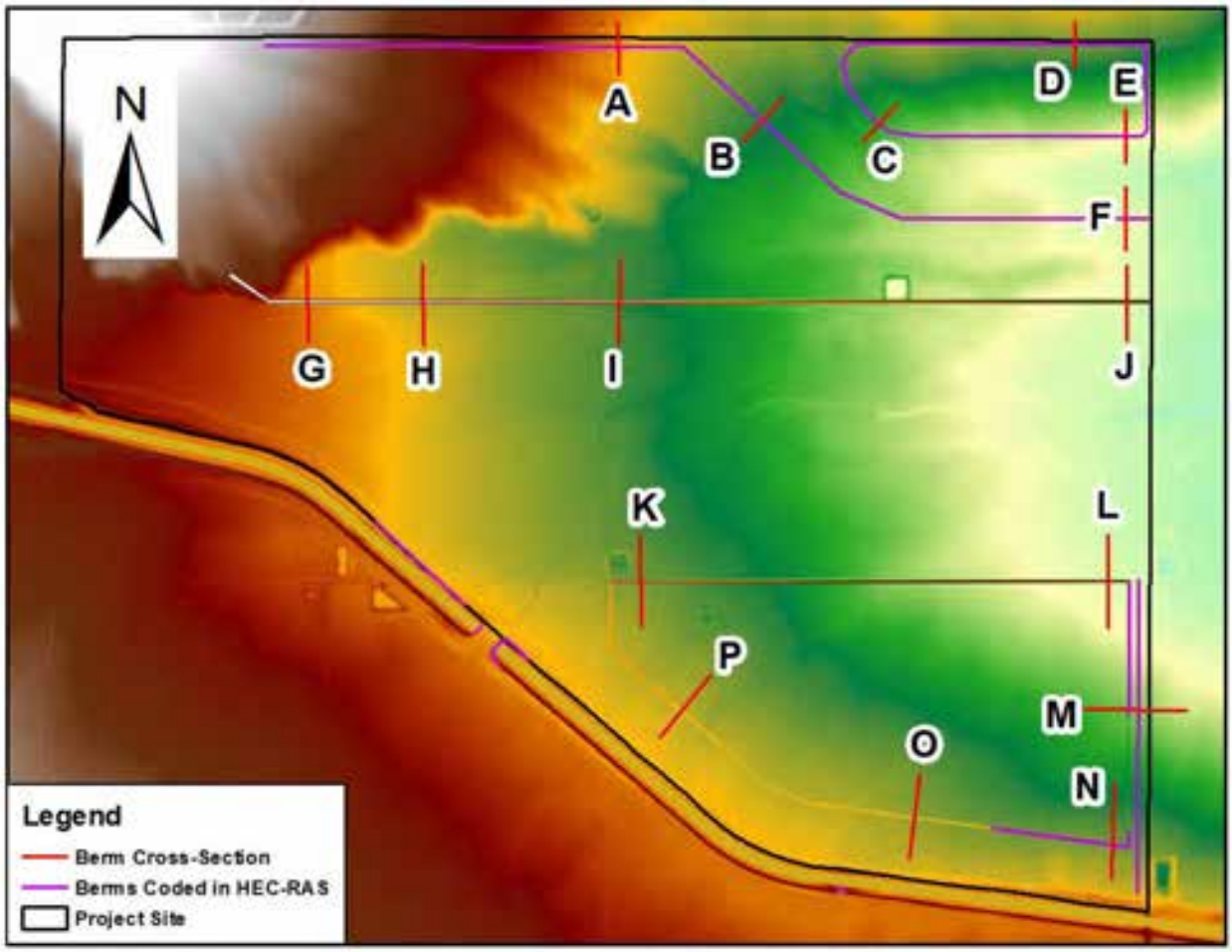
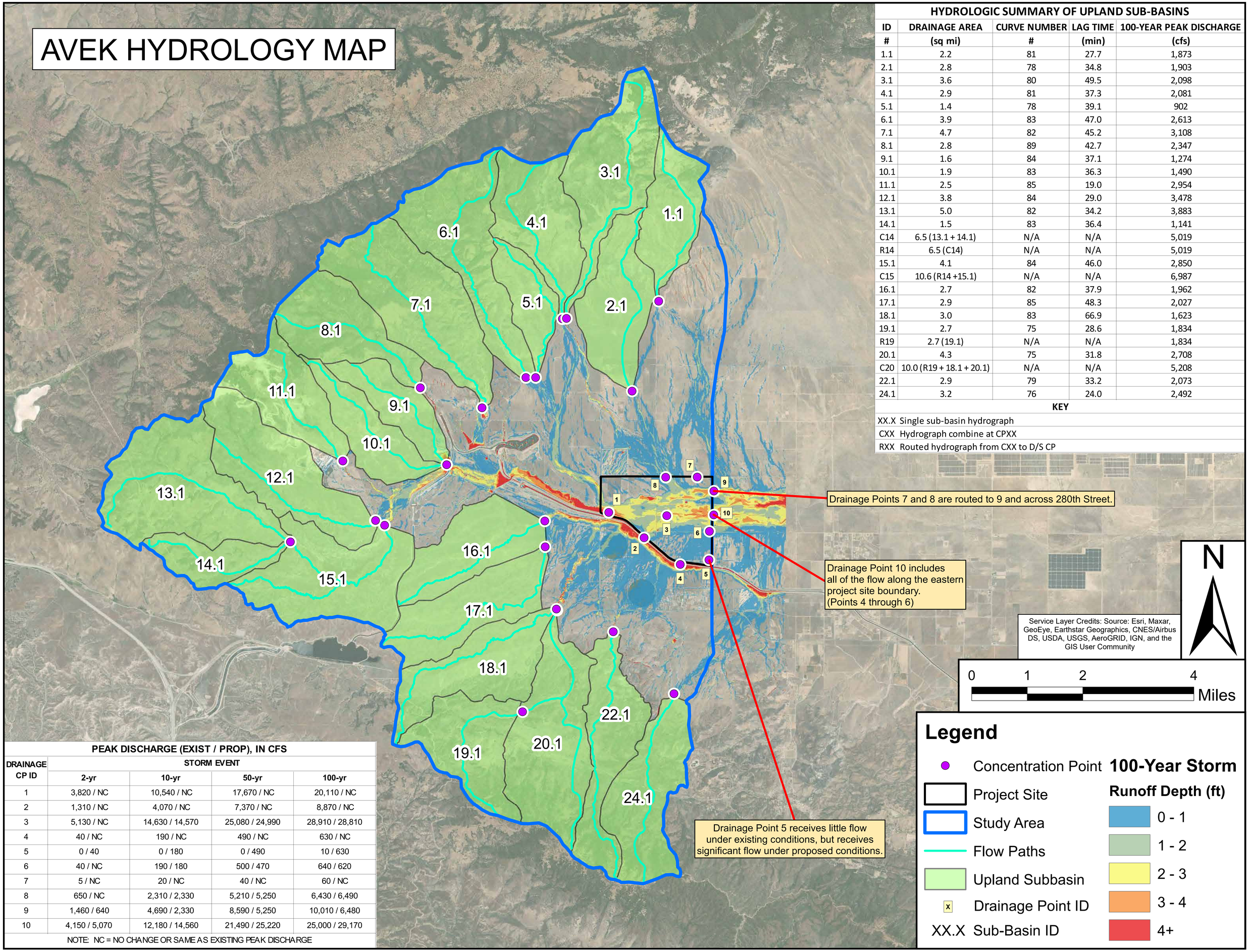


Figure 16 – Typical Berm Cross-Section General Location

APPENDIX A

Hydrology Map

AVEK HYDROLOGY MAP



HYDROLOGIC SUMMARY OF UPLAND SUB-BASINS

ID #	DRAINAGE AREA (sq mi)	CURVE NUMBER #	LAG TIME (min)	100-YEAR PEAK DISCHARGE (cfs)
1.1	2.2	81	27.7	1,873
2.1	2.8	78	34.8	1,903
3.1	3.6	80	49.5	2,098
4.1	2.9	81	37.3	2,081
5.1	1.4	78	39.1	902
6.1	3.9	83	47.0	2,613
7.1	4.7	82	45.2	3,108
8.1	2.8	89	42.7	2,347
9.1	1.6	84	37.1	1,274
10.1	1.9	83	36.3	1,490
11.1	2.5	85	19.0	2,954
12.1	3.8	84	29.0	3,478
13.1	5.0	82	34.2	3,883
14.1	1.5	83	36.4	1,141
C14	6.5 (13.1 + 14.1)	N/A	N/A	5,019
R14	6.5 (C14)	N/A	N/A	5,019
15.1	4.1	84	46.0	2,850
C15	10.6 (R14 +15.1)	N/A	N/A	6,987
16.1	2.7	82	37.9	1,962
17.1	2.9	85	48.3	2,027
18.1	3.0	83	66.9	1,623
19.1	2.7	75	28.6	1,834
R19	2.7 (19.1)	N/A	N/A	1,834
20.1	4.3	75	31.8	2,708
C20	10.0 (R19 + 18.1 + 20.1)	N/A	N/A	5,208
22.1	2.9	79	33.2	2,073
24.1	3.2	76	24.0	2,492

KEY

XX.X Single sub-basin hydrograph
CXX Hydrograph combine at CPXX
RXX Routed hydrograph from CXX to D/S CP

PEAK DISCHARGE (EXIST / PROP), IN CFS

DRAINAGE CP ID	STORM EVENT 2-yr	10-yr	50-yr	100-yr
1	3,820 / NC	10,540 / NC	17,670 / NC	20,110 / NC
2	1,310 / NC	4,070 / NC	7,370 / NC	8,870 / NC
3	5,130 / NC	14,630 / 14,570	25,080 / 24,990	28,910 / 28,810
4	40 / NC	190 / NC	490 / NC	630 / NC
5	0 / 40	0 / 180	0 / 490	10 / 630
6	40 / NC	190 / 180	500 / 470	640 / 620
7	5 / NC	20 / NC	40 / NC	60 / NC
8	650 / NC	2,310 / 2,330	5,210 / 5,250	6,430 / 6,490
9	1,460 / 640	4,690 / 2,330	8,590 / 5,250	10,010 / 6,480
10	4,150 / 5,070	12,180 / 14,560	21,490 / 25,220	25,000 / 29,170

NOTE: NC = NO CHANGE OR SAME AS EXISTING PEAK DISCHARGE

APPENDIX B

Hydrologic Physical Parameter Summaries

TABLE B1: CN VALUE SUMMARY

TABLE B2: TC VALUE SUMMARY

APPENDIX B

TABLE B1

CN VALUE SUMMARY

SUBBASIN	WEIGHTED CN
1.1	81
1.2	74
2.1	78
2.2	77
3.1	80
3.2	73
4.1	81
5.1	78
5.2	71
6.1	83
7.1	82
7.5	77
8.1	89
9.1	84
10.1	83
11.1	85
11.2	79
12.1	84
13.1	82
14.1	83
15.1	84
16.1	82
17.1	85
18.1	83
18.2	75
19.1	75
20.1	75
21.1	79
22.1	79
23.1	82
24.1	76
24.2	73
RAS DOMAIN	76

APPENDIX B

TABLE B2

TC VALUE SUMMARY

Basin	Total Concentration Time (minutes)	Lag Time (minutes)	Lag Time (hours)
1.1	46.1	27.7	0.46
2.1	58.1	34.8	0.58
3.1	82.6	49.5	0.83
4.1	62.1	37.3	0.62
5.1	65.1	39.1	0.65
6.1	78.3	47.0	0.78
7.1	75.4	45.2	0.75
8.1	71.2	42.7	0.71
9.1	61.8	37.1	0.62
10.1	60.5	36.3	0.60
11.1	31.7	19.0	0.32
12.1	48.3	29.0	0.48
13.1	57.0	34.2	0.57
14.1	60.6	36.4	0.61
15.1	76.7	46.0	0.77
16.1	63.2	37.9	0.63
17.1	80.6	48.3	0.81
18.1	111.4	66.9	1.11
19.1	47.6	28.6	0.48
20.1	52.9	31.8	0.53
22.1	55.3	33.2	0.55
24.1	40.1	24.0	0.40

APPENDIX C

Rainfall Data

NOAA Atlas 14, Volume 6, Version 2
Location name: Tehachapi, California, USA*
Latitude: 34.8186°, Longitude: -118.6964°
Elevation: 3057.57 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.084 (0.070-0.103)	0.108 (0.089-0.131)	0.139 (0.115-0.170)	0.166 (0.136-0.205)	0.204 (0.161-0.260)	0.235 (0.182-0.306)	0.267 (0.201-0.357)	0.301 (0.221-0.415)	0.349 (0.246-0.502)	0.388 (0.263-0.578)
10-min	0.121 (0.100-0.147)	0.154 (0.128-0.188)	0.200 (0.165-0.244)	0.238 (0.195-0.293)	0.292 (0.231-0.373)	0.336 (0.260-0.439)	0.382 (0.289-0.512)	0.432 (0.317-0.594)	0.501 (0.352-0.720)	0.557 (0.377-0.829)
15-min	0.146 (0.121-0.178)	0.186 (0.154-0.227)	0.241 (0.199-0.295)	0.288 (0.236-0.355)	0.354 (0.280-0.451)	0.407 (0.315-0.530)	0.462 (0.349-0.619)	0.522 (0.383-0.719)	0.606 (0.426-0.871)	0.673 (0.457-1.00)
30-min	0.204 (0.169-0.248)	0.260 (0.215-0.317)	0.337 (0.278-0.412)	0.401 (0.329-0.495)	0.493 (0.390-0.630)	0.567 (0.439-0.740)	0.645 (0.487-0.863)	0.728 (0.534-1.00)	0.845 (0.594-1.22)	0.939 (0.637-1.40)
60-min	0.292 (0.242-0.356)	0.373 (0.309-0.455)	0.483 (0.399-0.591)	0.575 (0.471-0.710)	0.707 (0.559-0.903)	0.813 (0.629-1.06)	0.925 (0.698-1.24)	1.04 (0.766-1.44)	1.21 (0.851-1.74)	1.35 (0.913-2.01)
2-hr	0.444 (0.368-0.541)	0.576 (0.477-0.702)	0.750 (0.619-0.917)	0.892 (0.731-1.10)	1.09 (0.861-1.39)	1.24 (0.960-1.62)	1.39 (1.05-1.87)	1.55 (1.14-2.14)	1.77 (1.24-2.54)	1.93 (1.31-2.87)
3-hr	0.577 (0.478-0.703)	0.752 (0.623-0.917)	0.980 (0.809-1.20)	1.17 (0.954-1.44)	1.42 (1.12-1.81)	1.61 (1.24-2.10)	1.80 (1.36-2.41)	2.00 (1.47-2.75)	2.26 (1.59-3.24)	2.45 (1.66-3.65)
6-hr	0.882 (0.731-1.08)	1.16 (0.957-1.41)	1.51 (1.25-1.85)	1.79 (1.47-2.21)	2.17 (1.72-2.77)	2.46 (1.90-3.21)	2.74 (2.07-3.67)	3.03 (2.22-4.17)	3.41 (2.40-4.90)	3.69 (2.50-5.50)
12-hr	1.25 (1.04-1.52)	1.66 (1.37-2.02)	2.18 (1.80-2.67)	2.60 (2.13-3.21)	3.16 (2.50-4.04)	3.58 (2.78-4.68)	4.01 (3.03-5.36)	4.43 (3.25-6.11)	4.99 (3.51-7.18)	5.41 (3.67-8.06)
24-hr	1.66 (1.47-1.90)	2.22 (1.97-2.56)	2.96 (2.61-3.42)	3.55 (3.11-4.13)	4.35 (3.68-5.23)	4.95 (4.11-6.09)	5.55 (4.50-7.00)	6.17 (4.85-8.00)	6.99 (5.27-9.45)	7.60 (5.54-10.7)
2-day	2.02 (1.79-2.32)	2.75 (2.44-3.17)	3.71 (3.28-4.28)	4.48 (3.93-5.22)	5.52 (4.68-6.65)	6.31 (5.23-7.76)	7.10 (5.75-8.95)	7.90 (6.22-10.3)	8.97 (6.77-12.1)	9.78 (7.12-13.7)
3-day	2.24 (1.99-2.58)	3.09 (2.74-3.56)	4.21 (3.72-4.86)	5.11 (4.48-5.95)	6.32 (5.36-7.61)	7.24 (6.01-8.91)	8.17 (6.61-10.3)	9.12 (7.17-11.8)	10.4 (7.83-14.1)	11.4 (8.27-15.9)
4-day	2.38 (2.11-2.74)	3.31 (2.93-3.81)	4.53 (4.01-5.24)	5.53 (4.84-6.43)	6.87 (5.82-8.27)	7.89 (6.54-9.70)	8.92 (7.22-11.2)	9.98 (7.85-12.9)	11.4 (8.59-15.4)	12.5 (9.09-17.5)
7-day	2.68 (2.38-3.08)	3.75 (3.32-4.32)	5.18 (4.57-5.98)	6.34 (5.56-7.38)	7.93 (6.72-9.55)	9.15 (7.59-11.3)	10.4 (8.41-13.1)	11.7 (9.17-15.1)	13.4 (10.1-18.1)	14.7 (10.7-20.6)
10-day	2.83 (2.51-3.25)	3.98 (3.53-4.58)	5.52 (4.88-6.38)	6.80 (5.96-7.91)	8.54 (7.24-10.3)	9.89 (8.21-12.2)	11.3 (9.12-14.2)	12.7 (9.98-16.5)	14.6 (11.0-19.8)	16.1 (11.7-22.6)
20-day	3.20 (2.84-3.68)	4.58 (4.06-5.27)	6.46 (5.71-7.46)	8.03 (7.04-9.35)	10.2 (8.67-12.3)	12.0 (9.92-14.7)	13.7 (11.1-17.3)	15.6 (12.3-20.2)	18.1 (13.7-24.5)	20.1 (14.6-28.2)
30-day	3.68 (3.27-4.24)	5.29 (4.69-6.10)	7.52 (6.65-8.68)	9.40 (8.24-10.9)	12.1 (10.2-14.5)	14.2 (11.8-17.4)	16.3 (13.2-20.6)	18.6 (14.7-24.2)	21.8 (16.4-29.5)	24.3 (17.7-34.0)
45-day	4.34 (3.85-4.99)	6.23 (5.52-7.17)	8.86 (7.83-10.2)	11.1 (9.74-12.9)	14.3 (12.1-17.3)	16.9 (14.0-20.8)	19.6 (15.9-24.7)	22.4 (17.6-29.1)	26.4 (19.9-35.7)	29.5 (21.4-41.3)
60-day	4.89 (4.34-5.62)	6.96 (6.17-8.02)	9.88 (8.73-11.4)	12.4 (10.9-14.4)	16.0 (13.6-19.3)	18.9 (15.7-23.3)	22.0 (17.8-27.7)	25.2 (19.8-32.7)	29.7 (22.4-40.1)	33.2 (24.2-46.6)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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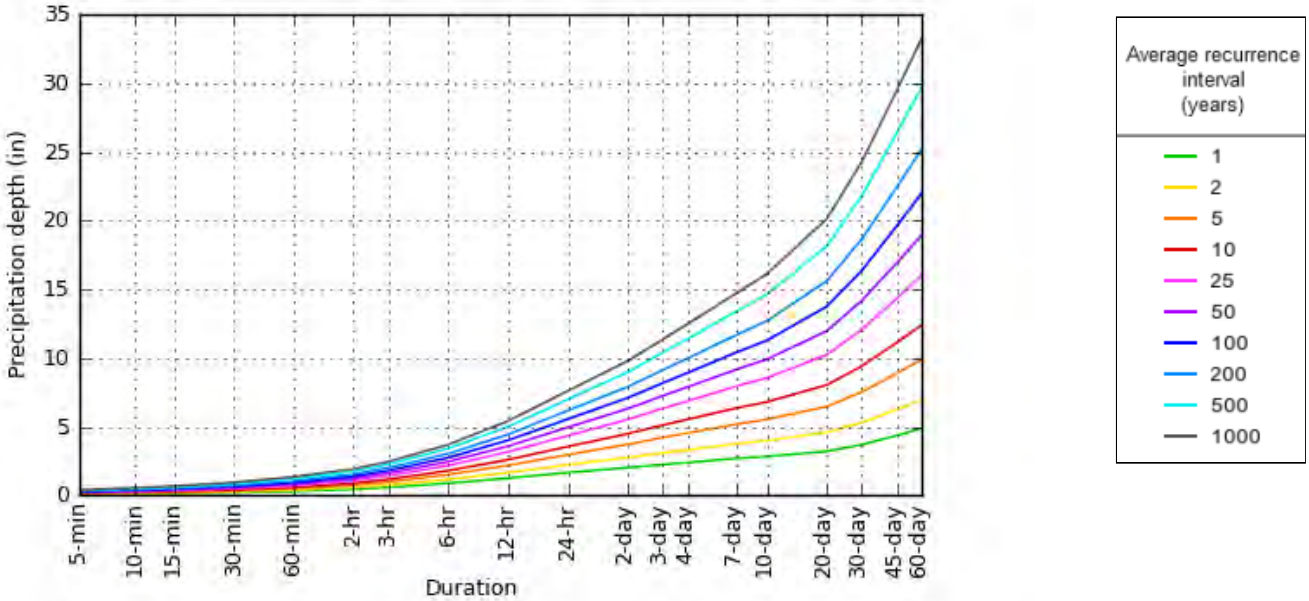
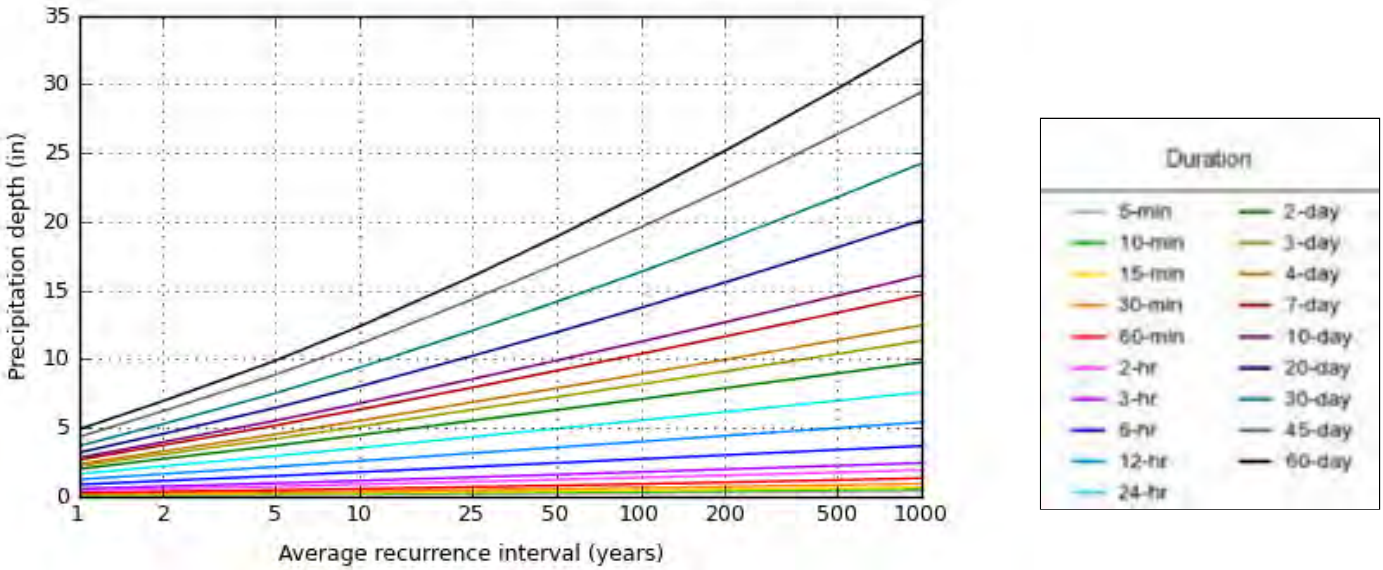
PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 34.8186°, Longitude: -118.6964°





NOAA Atlas 14, Volume 6, Version 2

Created (GMT): Mon Jun 22 17:57:42 2020

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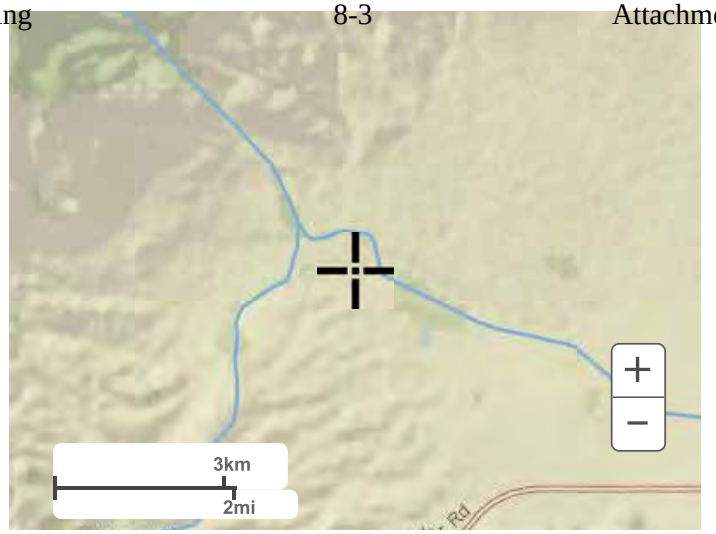
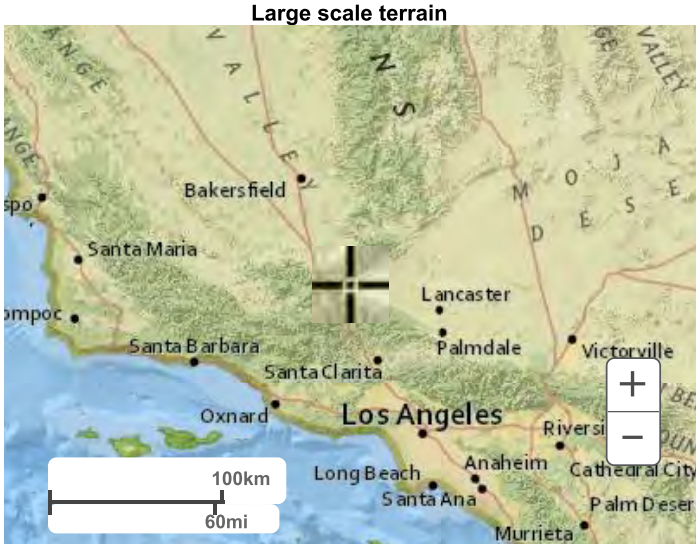
Maps & aerials

Small scale terrain

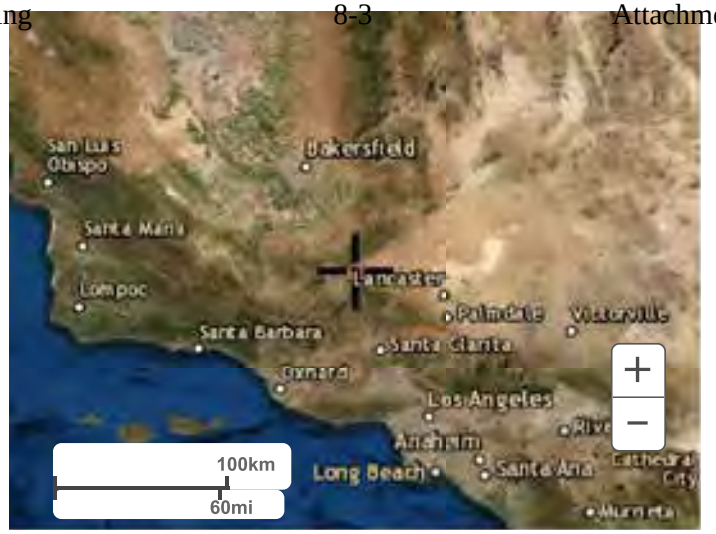


Large scale terrain



Large scale map

Large scale aerial



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National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
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Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

APPENDIX D

Rainfall-Runoff Modeling Results

APPENDIX D.1

SUMMARY OF RESULTS

TABLE D1: HEC-HMS RESULTS SUMMARY

TABLE D2: HEC-RAS RESULTS SUMMARY

APPENDIX D.1 - TABLE D1
HEC-HMS RESULTS SUMMARY - PEAK DISCHARGES

INFLOW LOCATION	STORM EVENT FREQUENCY (YEARS)					
(NAME OF HMS OUTFLOW NODE /RAS BOUNDARY INFLOW LINE)	2	5	10	25	50	100
	PEAK Q (CFS)	PEAK Q (CFS)	PEAK Q (CFS)	PEAK Q (CFS)	PEAK Q (CFS)	PEAK Q (CFS)
INFLOW_1.1	330	629	893	1,274	1,571	1,873
INFLOW_2.1	271	572	847	1,252	1,573	1,903
INFLOW_3.1	346	679	978	1,411	1,750	2,098
INFLOW_4.1	366	698	991	1,415	1,744	2,081
INFLOW_5.1	128	271	402	594	745	902
INFLOW_6.1	519	935	1,297	1,812	2,209	2,613
INFLOW_7.1	582	1,077	1,511	2,133	2,616	3,108
INFLOW_8.1	633	1,001	1,303	1,719	2,033	2,347
INFLOW_9.1	268	471	645	892	1,082	1,274
INFLOW_10.1	296	534	740	1,033	1,260	1,490
INFLOW_9.1_10.1	564	1,002	1,385	1,925	2,341	2,763
INFLOW_11.1	660	1,132	1,532	2,093	2,522	2,954
INFLOW_12.1	732	1,287	1,763	2,437	2,954	3,478
INFLOW_13.3	1,388	2,502	3,469	4,846	5,908	6,987
INFLOW_16.2	367	681	955	1,347	1,652	1,962
INFLOW_17.1	449	771	1,046	1,432	1,728	2,027
INFLOW_18.11	728	1,542	2,294	3,408	4,293	5,208
INFLOW_21.2	318	648	945	1,380	1,721	2,073
INFLOW_24.1	297	691	1,057	1,603	2,039	2,492

APPENDIX D.1 - TABLE D2
HEC-RAS RESULTS SUMMARY

PEAK DISCHARGES AT DRAINAGE POINTS - EXISTING

DRAINAGE POINT	STORM FREQUENCY (YRS)						DRAINAGE POINTS 9 & 10 ACCUMULATED VOLUME, OR VOLUME OF WATER LEAVING THE SITE (EXISTING CONDITIONS, AC-FT)
	2	5	10	25	50	100	
	PEAK Q (CFS)	PEAK Q (CFS)	PEAK Q (CFS)	PEAK Q (CFS)	PEAK Q (CFS)	PEAK Q (CFS)	
1	3,819	7,306	10,544	14,794	17,672	20,107	
2	1,306	2,768	4,074	5,935	7,373	8,868	
3	5,130	10,096	14,625	20,778	25,075	28,908	
4	41	100	185	348	486	630	15,240
5	0	1	2	3	4	6	
6	42	104	193	358	497	643	
7	4	11	19	32	44	58	
8	647	1,508	2,308	3,877	5,211	6,427	
9	1,455	3,168	4,689	6,964	8,588	10,005	
10	4,147	8,169	12,176	17,623	21,486	25,003	

PEAK DISCHARGES AT DRAINAGE POINTS - PROPOSED

DRAINAGE POINT	STORM FREQUENCY (YRS)						DRAINAGE POINTS 9 & 10 ACCUMULATED VOLUME, OR VOLUME OF WATER LEAVING THE SITE (PROPOSED CONDITIONS, AC-FT)
	2	5	10	25	50	100	
	PEAK Q (CFS)	PEAK Q (CFS)	PEAK Q (CFS)	PEAK Q (CFS)	PEAK Q (CFS)	PEAK Q (CFS)	
1	3,819	7,306	10,544	14,795	17,677	20,108	
2	1,306	2,768	4,074	5,935	7,373	8,868	
3	5,125	10,072	14,573	20,700	24,986	28,808	
4	41	100	185	348	486	630	15,078
5	30	92	184	341	479	628	
6	40	102	184	340	474	619	
7	4	11	19	32	44	58	
8	654	1,515	2,335	3,917	5,250	6,493	
9	637	1,492	2,331	3,896	5,247	6,478	
10	5,067	10,017	14,557	20,811	25,216	29,165	

APPENDIX D.2

HEC-RAS OUTPUT HYDROGRAPHS

Appendix D.2 – HEC-RAS Output Hydrographs

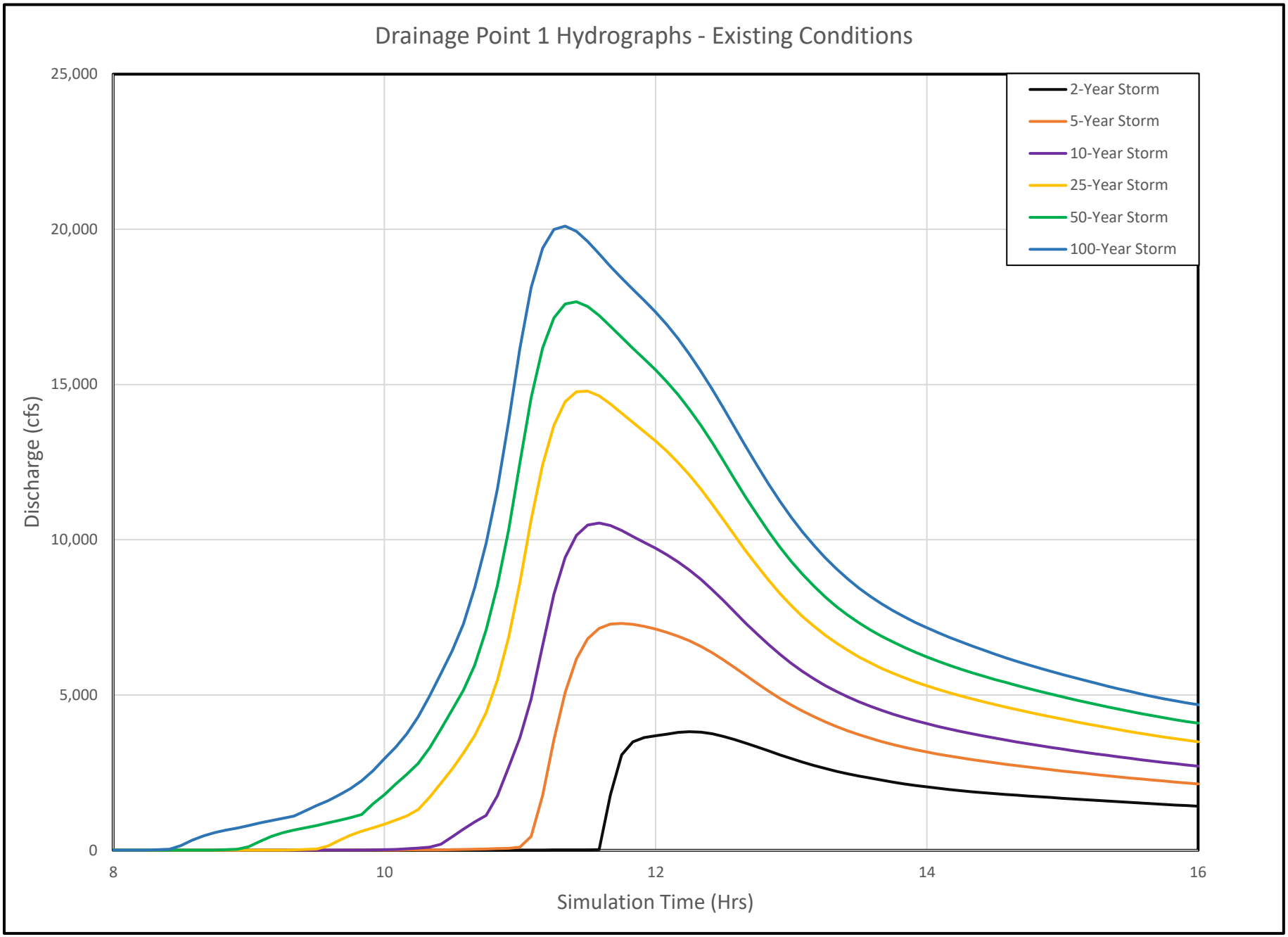
This appendix is being provided to document output hydrographs general shapes are reasonable and model run times capture the peak rate of flow. Additional explanation is provided to substantiate typical modeling run errors and model run times used for peak flow vs run time required to document total runoff volumes.

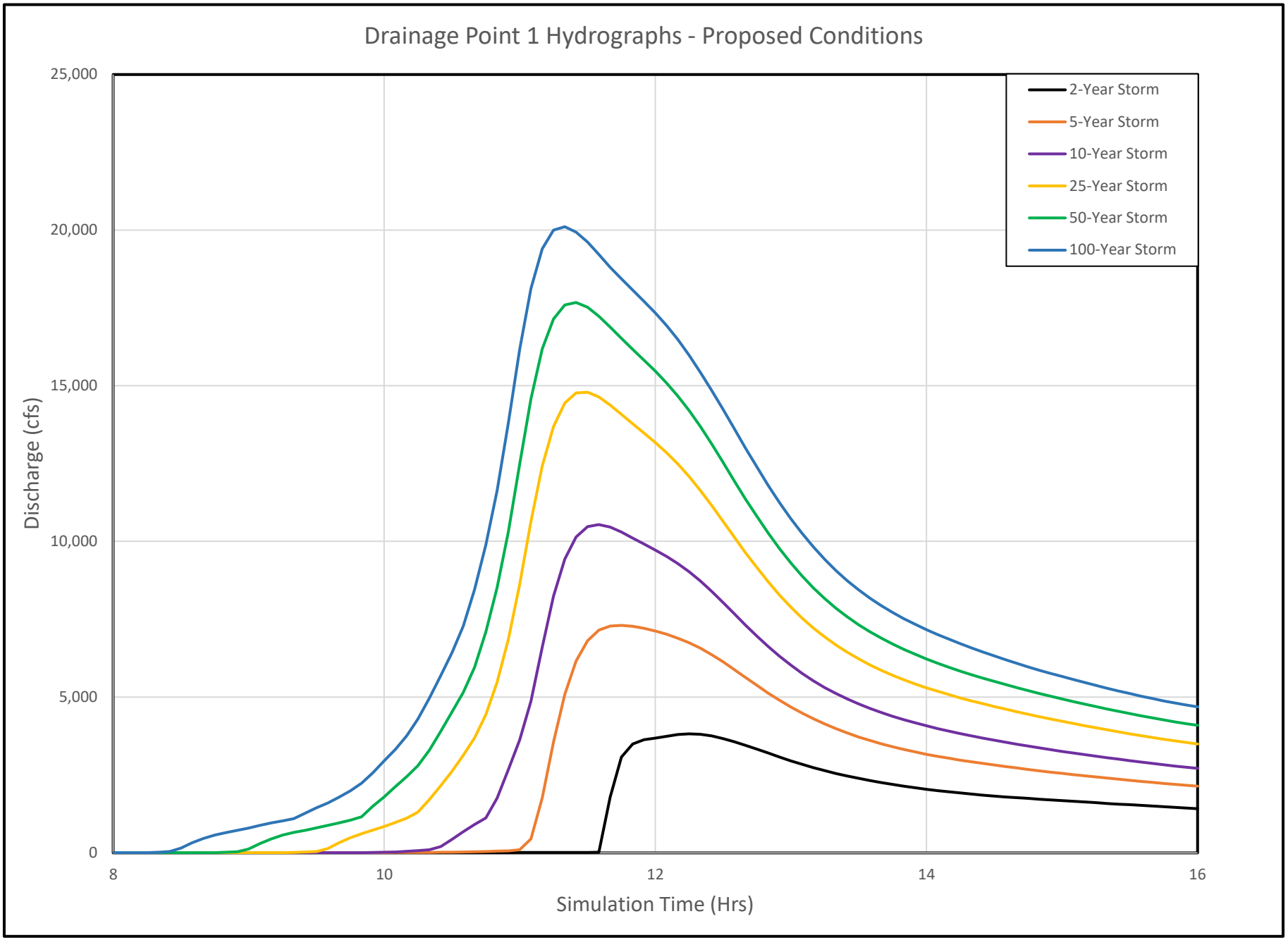
Both of the existing and proposed condition simulations of the 100-year-storm yielded an approximate 0.008-percent volume-conservation error. This translates to a volume error of just under 1.5 acre-feet, which is minor when compared to the 18,552 acre-feet entering the model domain via inflow nodes along the boundary and rain-on-grid precipitation.

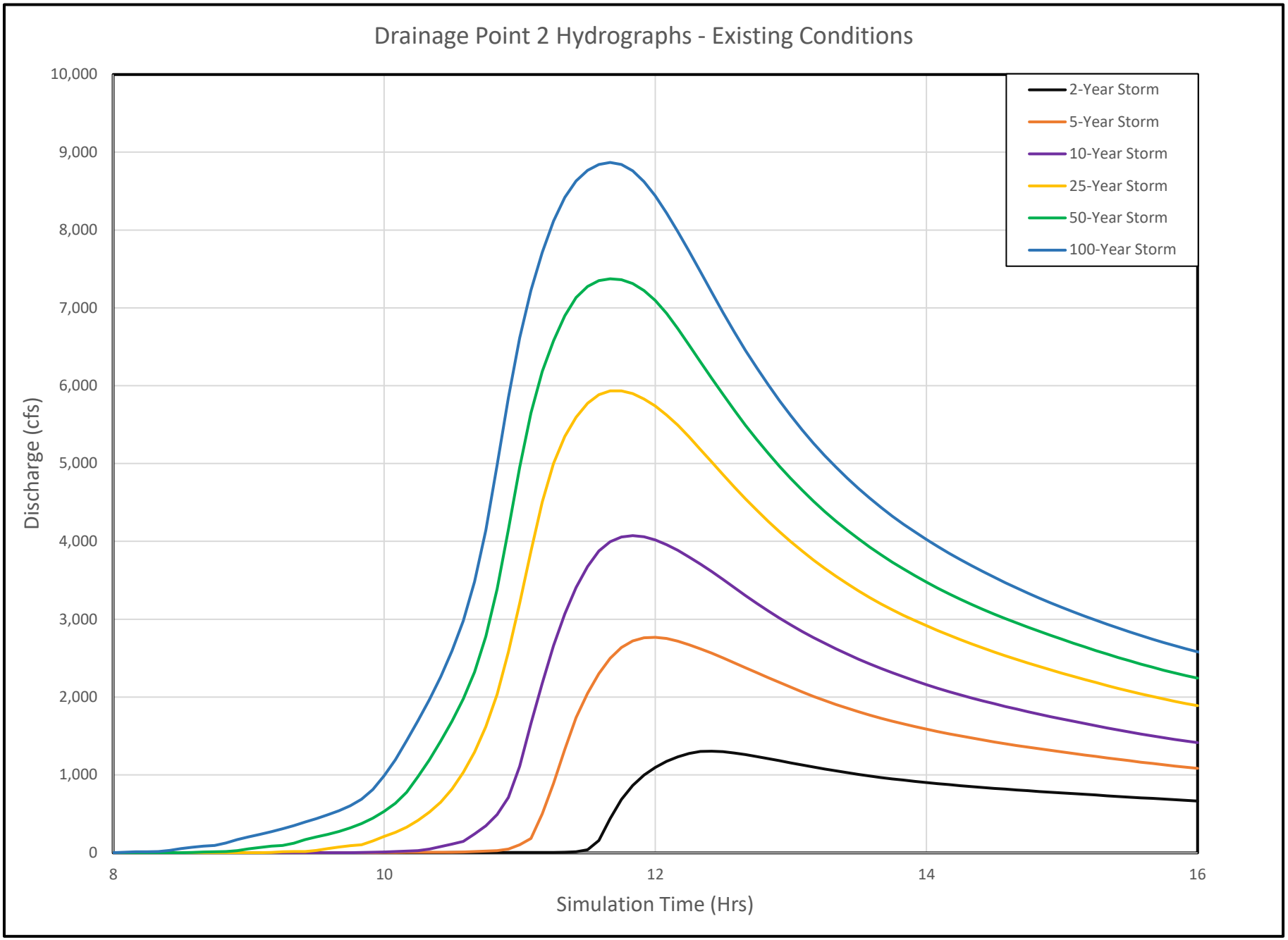
Although several water surface elevation errors – errors associated with balancing the water surface elevation between two cells in the HEC-RAS computational domain – appear in the model output, these errors were determined not to have a major impact on the modeling results, at least as far as the peak discharges are concerned. These water surface elevation errors often arise from steep slopes in the topography or very shallow flow depths.

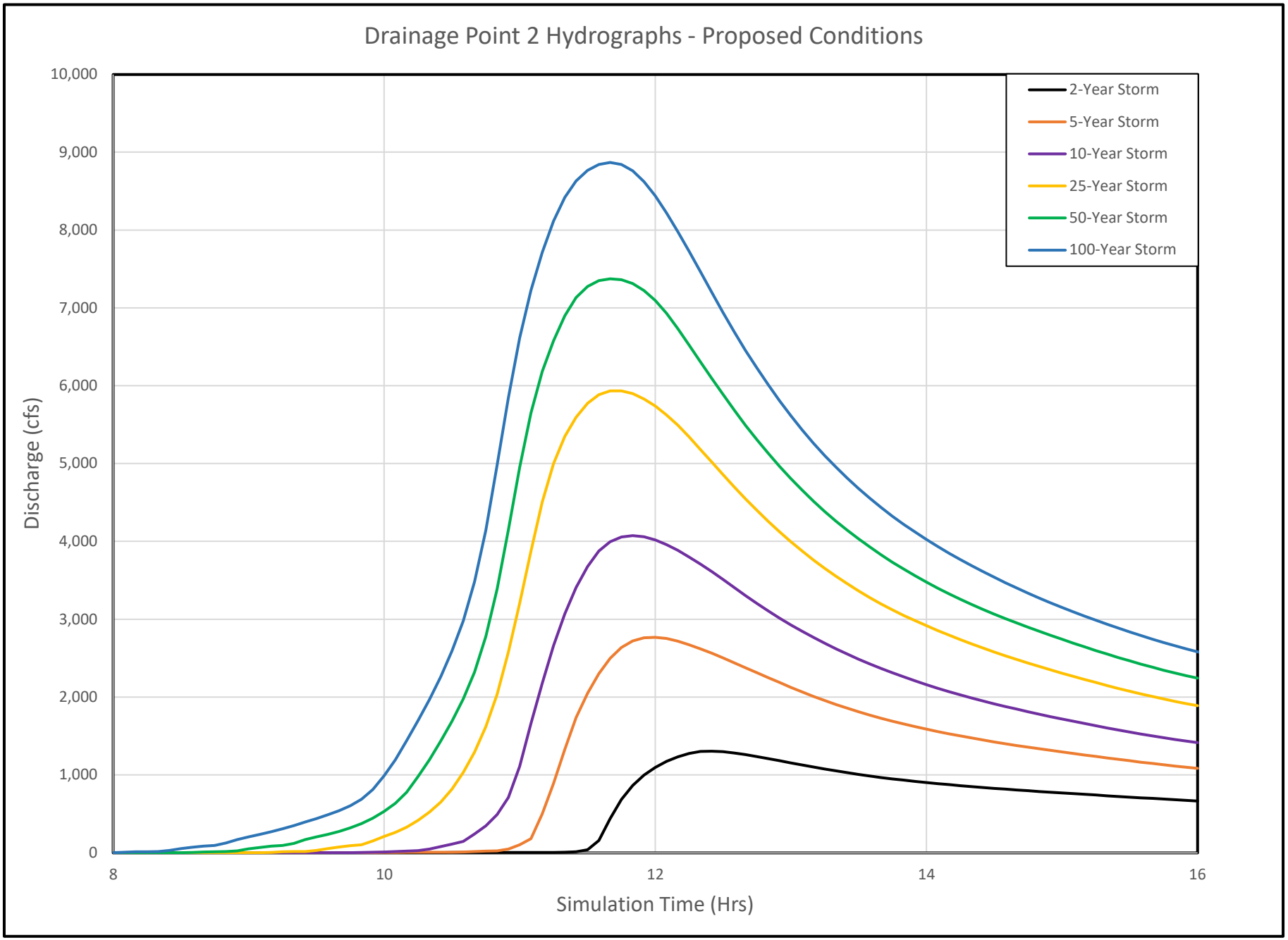
The following pages of Appendix D.2 contain the existing and proposed conditions hydrographs for each of the storm events – the 2, 5, 10, 25, 50 and 100-year storms – at each of the ten drainage points-of-interest. In the interest of time and efficiency, the simulations for the lower-return-period storm events were only run to the point of the sixteenth hour in the simulation, unlike the 100-year simulations, for which the full 48-hour simulation was executed. The hydrographs have accordingly been trimmed only to show hours 8 through 16 of the simulation.

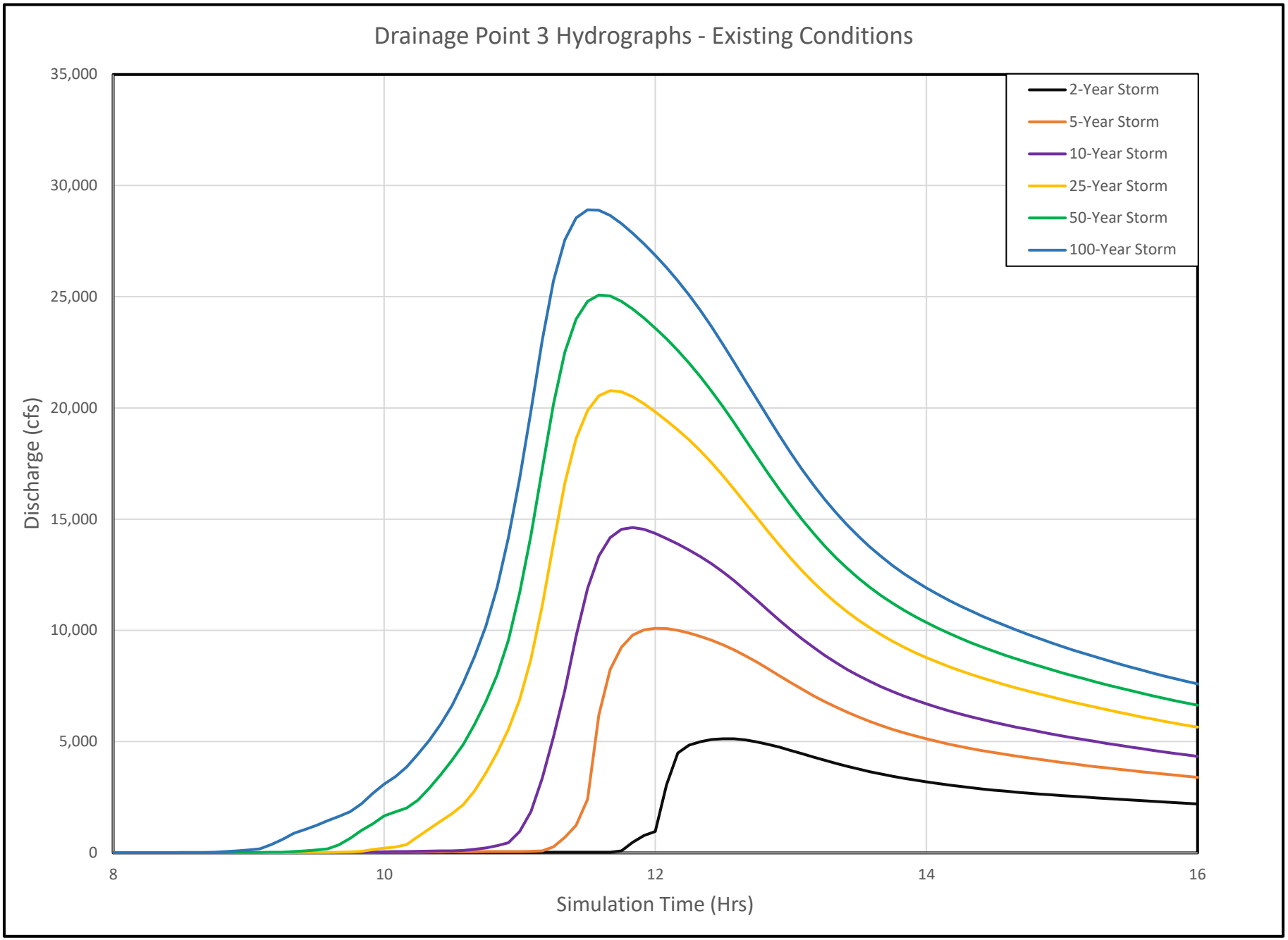
Several drainage concentration points show peak discharges under proposed conditions that closely match those of the existing conditions. Points 1, 2, 3, 4, 7 and 8 all fit this description. The remaining points – 5, 6, 9 and 10 – each had proposed conditions discharges that noticeably deviated from those of existing conditions. Point 5, which receives little-to-no discharge under existing conditions, receives all of the discharge of point 4 under proposed conditions. The point 6 existing conditions hydrograph has a particularly unique shape, with two local peaks: the first, small peak is produced by the conveyance of the local rainfall, while the second, larger peak is the flow being conveyed from upstream. Under proposed conditions, the small peak associated with the direct rainfall is not quite as noticeable. Drainage points 9 and 10 deviate from existing conditions in terms of peak discharge, due to flow from Pescado Creek being kept from joining with the primary, central drainage corridor.

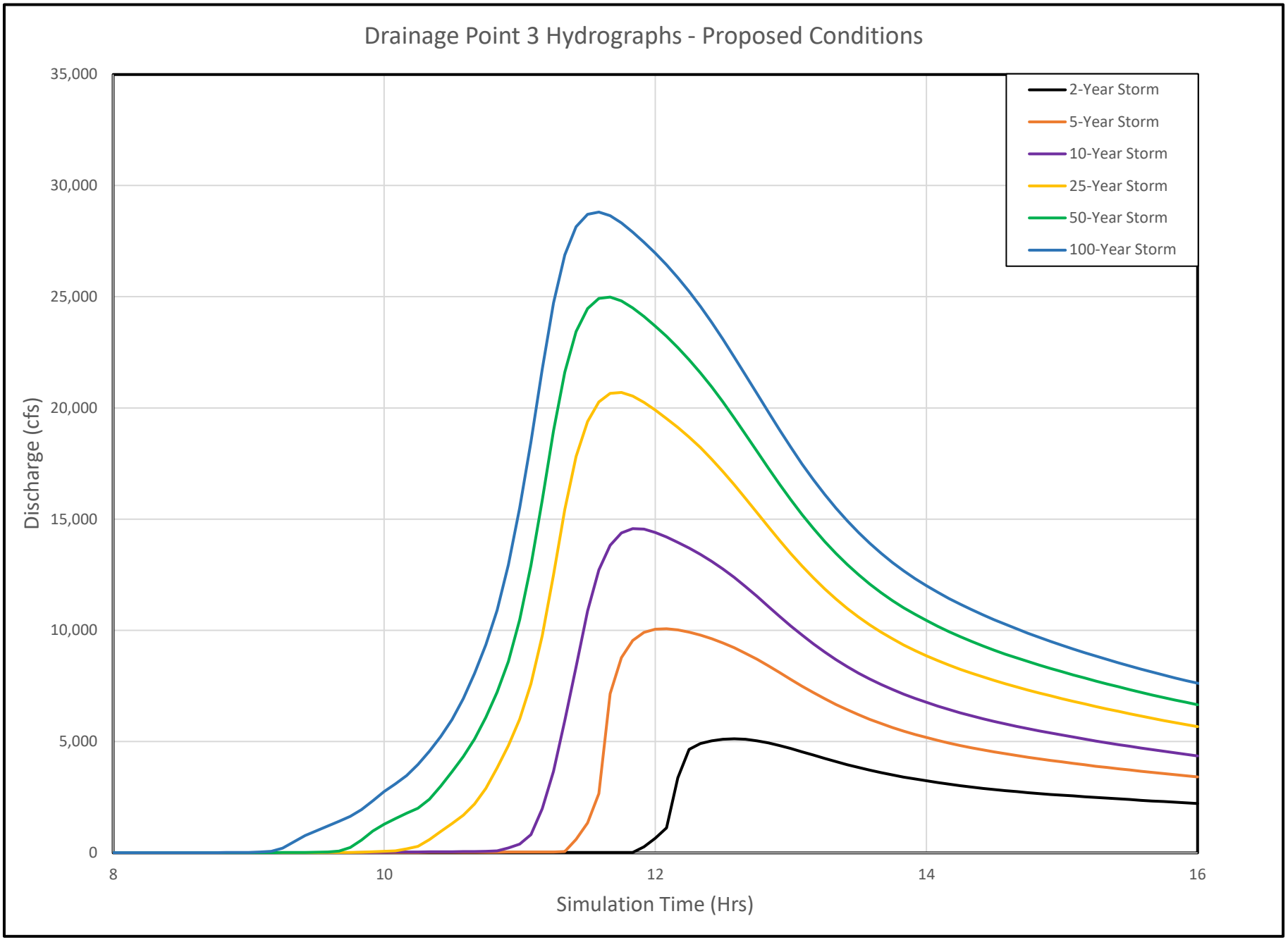

Drainage Point 1 Hydrographs - Existing Conditions
25,000
20,000
15,000
10,000
5,000
0
Discharge (cfs)
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

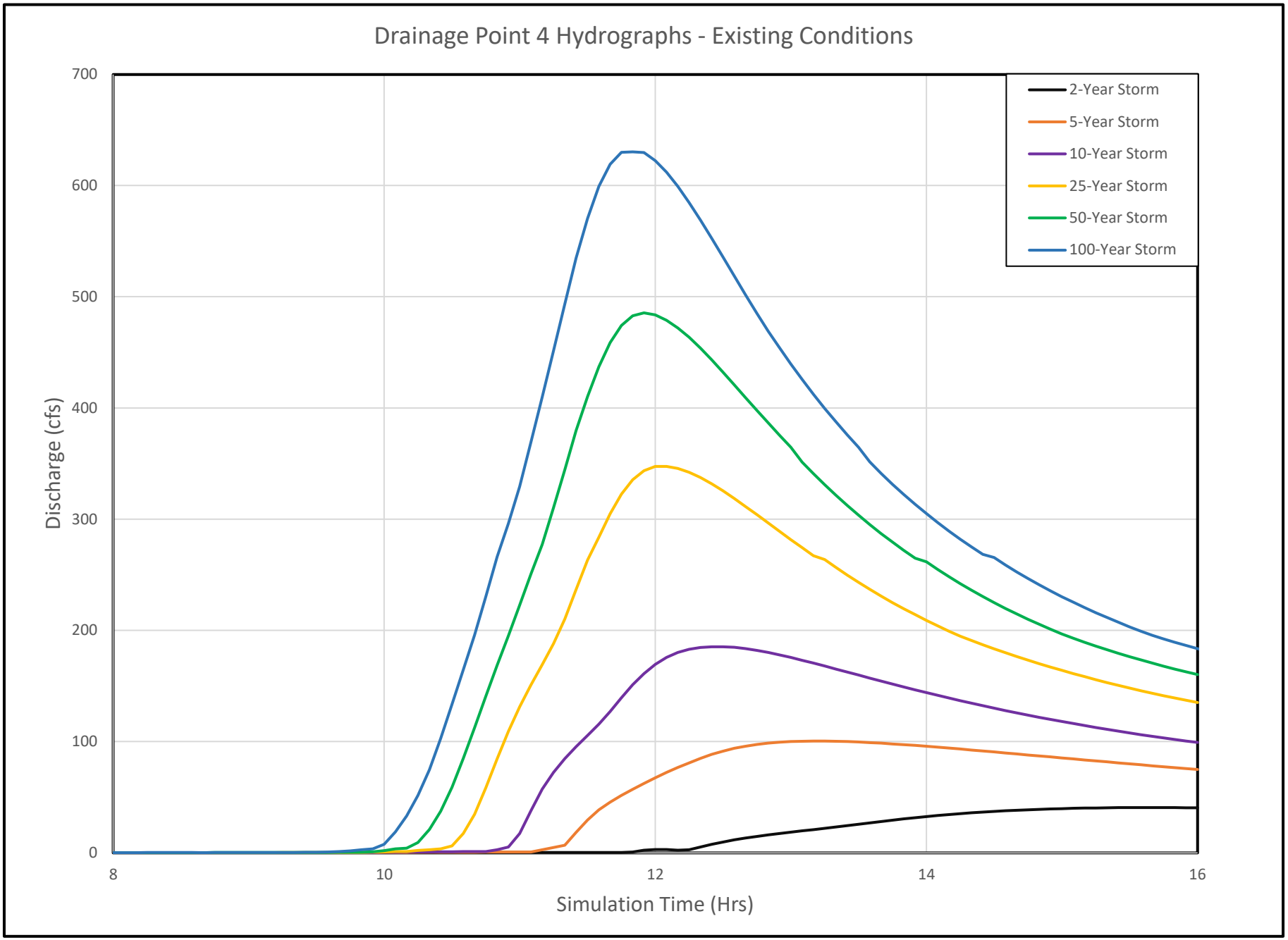

Drainage Point 1 Hydrographs - Proposed Conditions
25,000
20,000
15,000
10,000
5,000
0
Discharge (cfs)
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

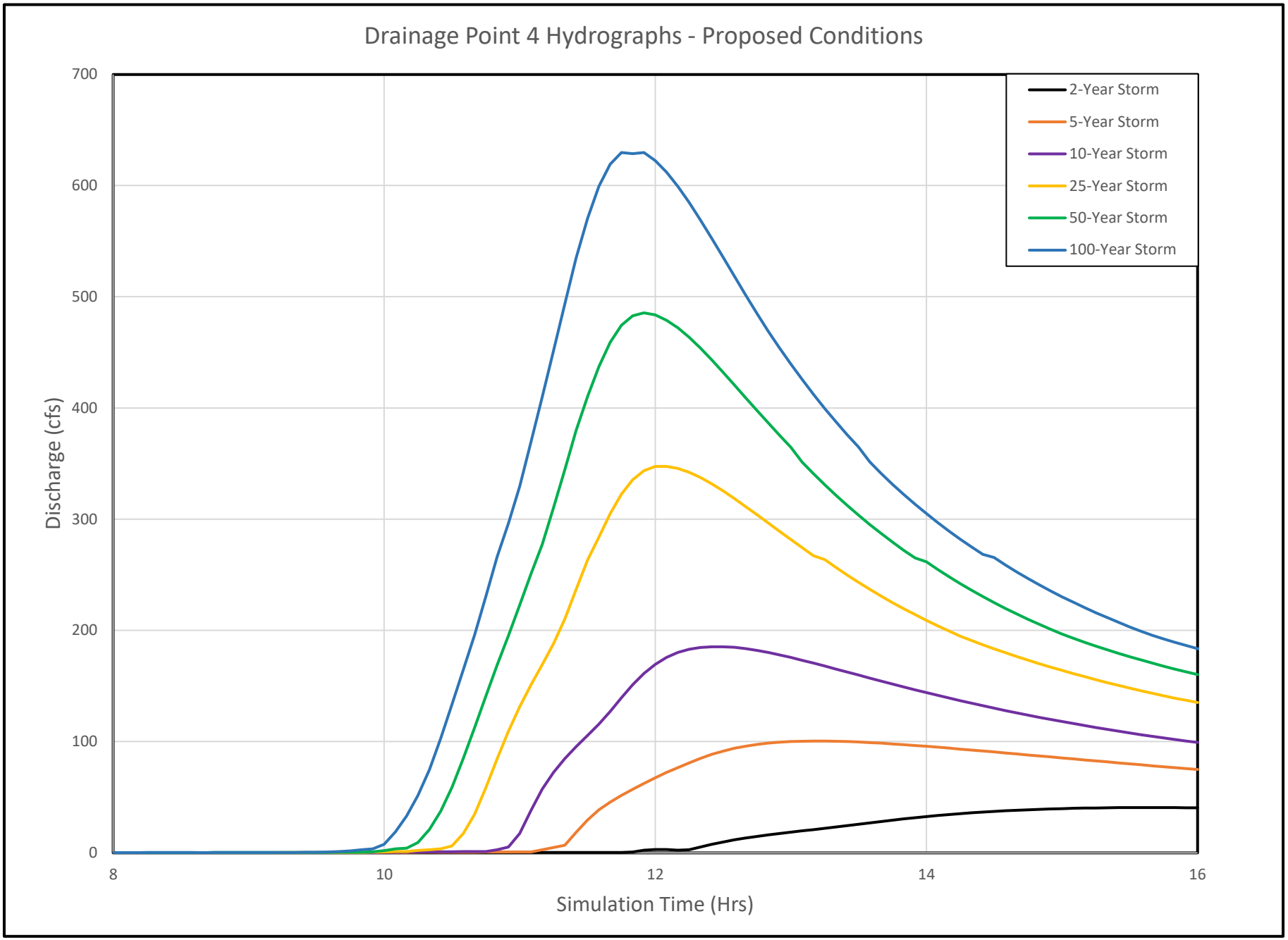

Drainage Point 2 Hydrographs - Existing Conditions
Discharge (cfs)
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

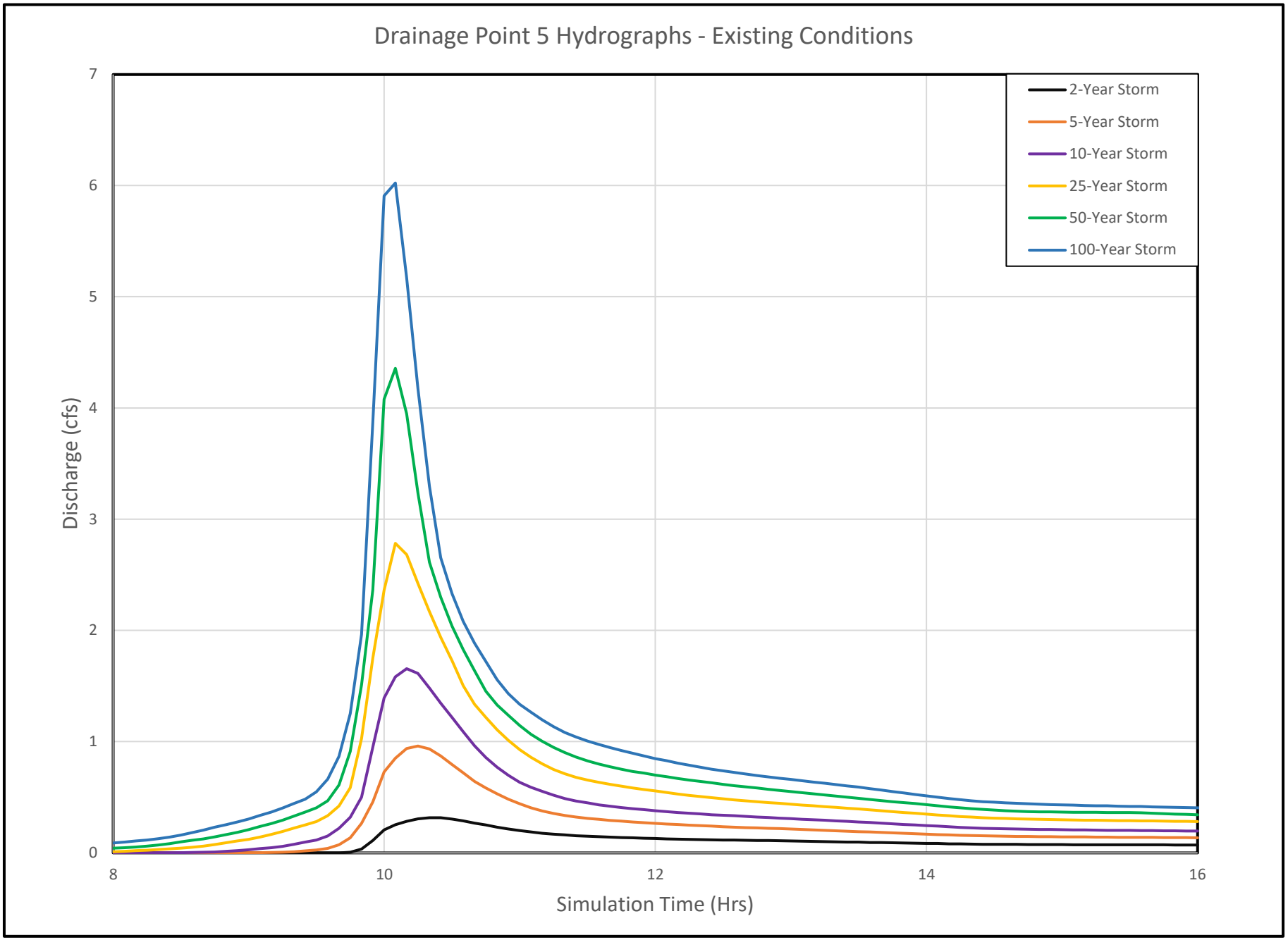

Drainage Point 2 Hydrographs - Proposed Conditions
Discharge (cfs)
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

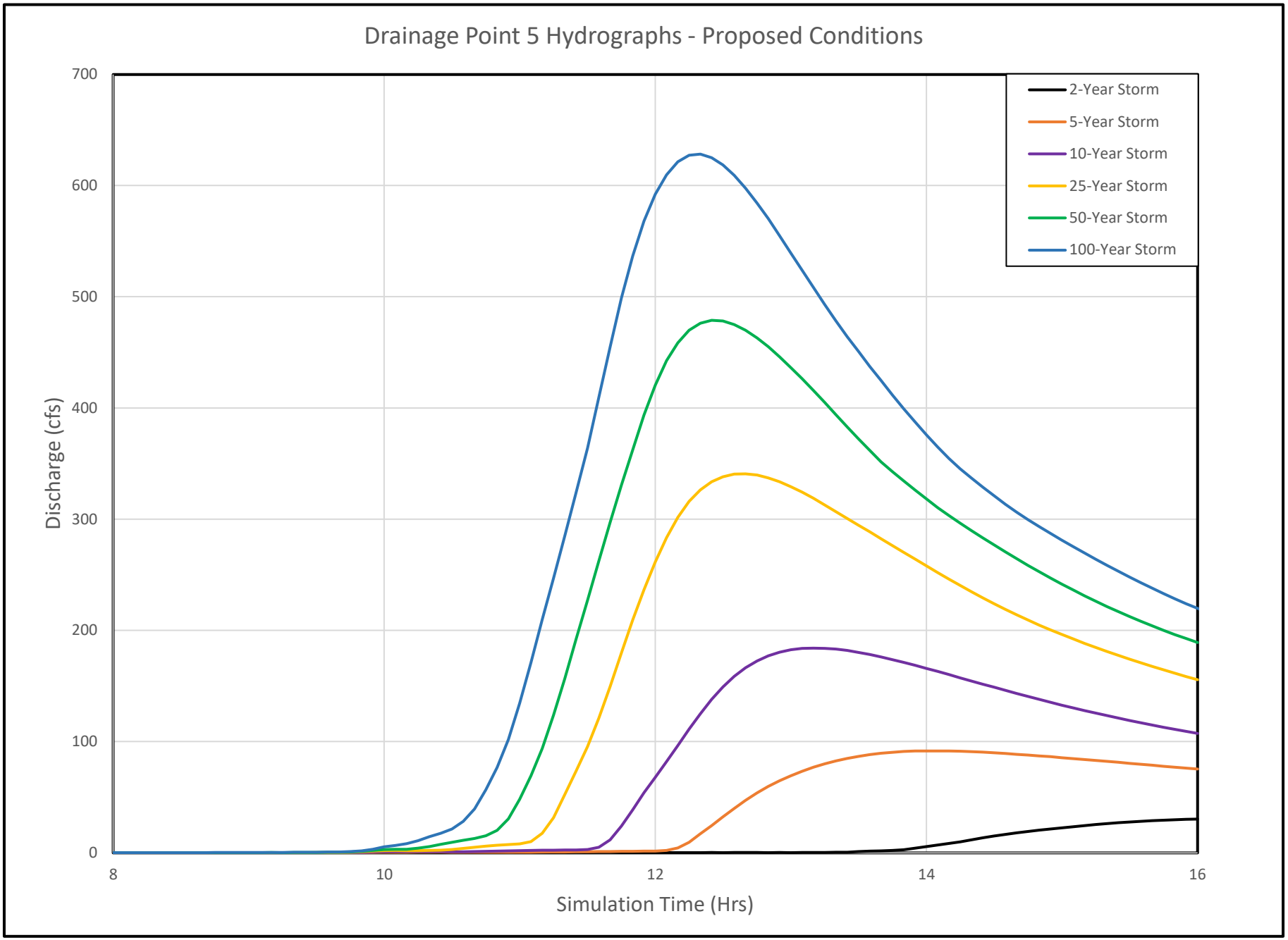

Drainage Point 3 Hydrographs - Existing Conditions
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Discharge (cfs)
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

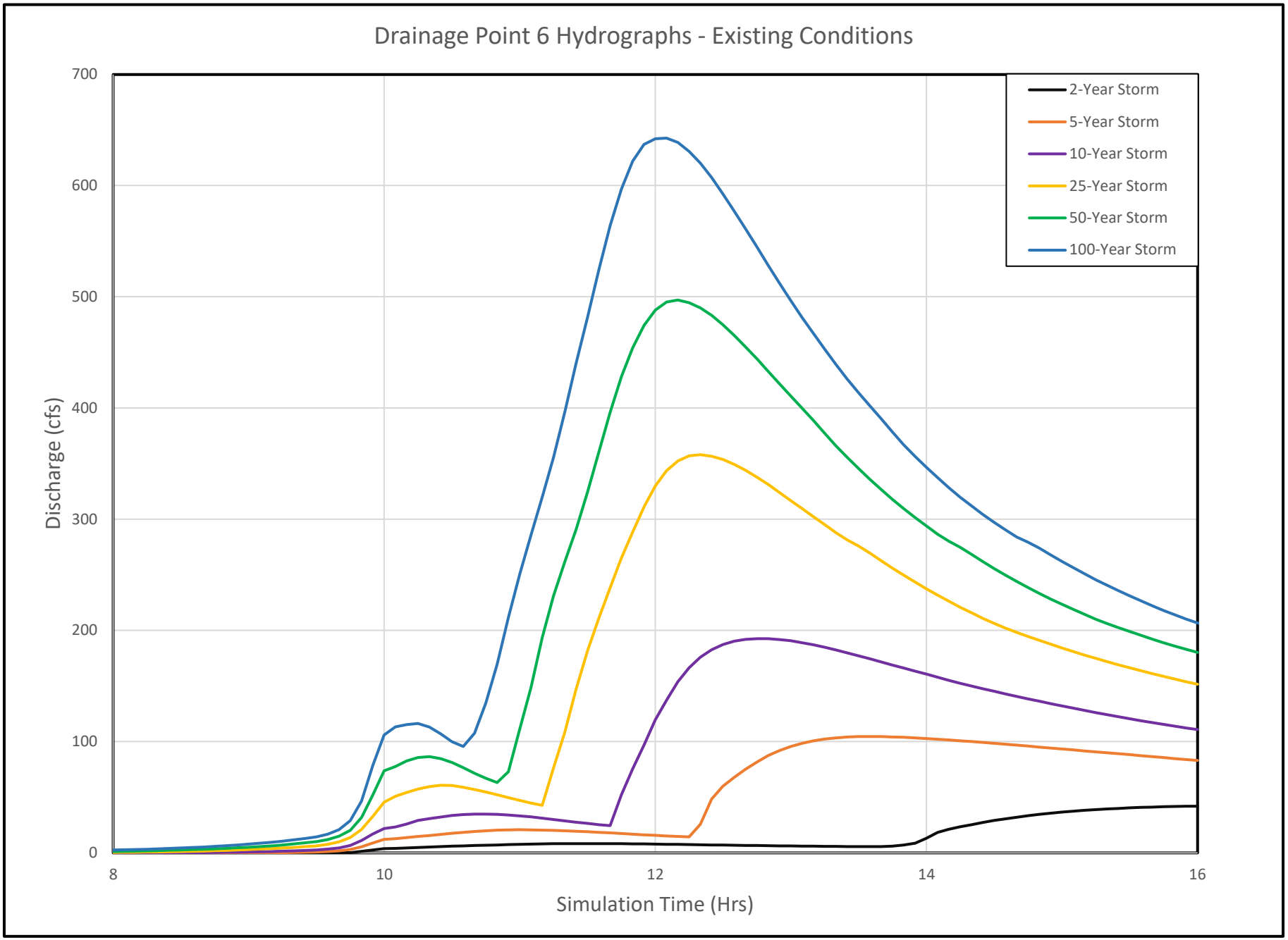

Drainage Point 3 Hydrographs - Proposed Conditions
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Discharge (cfs)
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

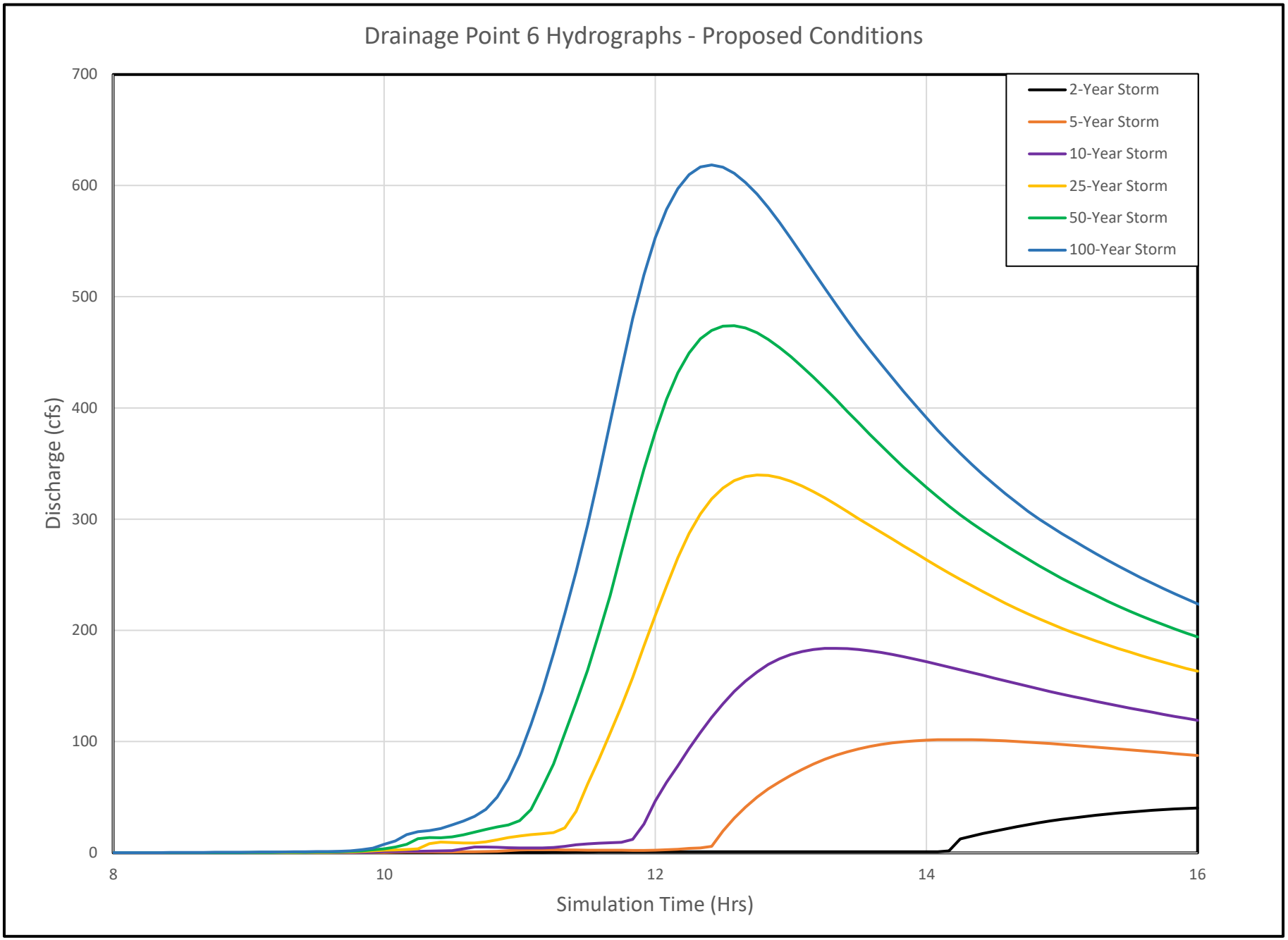

Drainage Point 4 Hydrographs - Existing Conditions
Discharge (cfs)
700
600
500
400
300
200
100
0
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

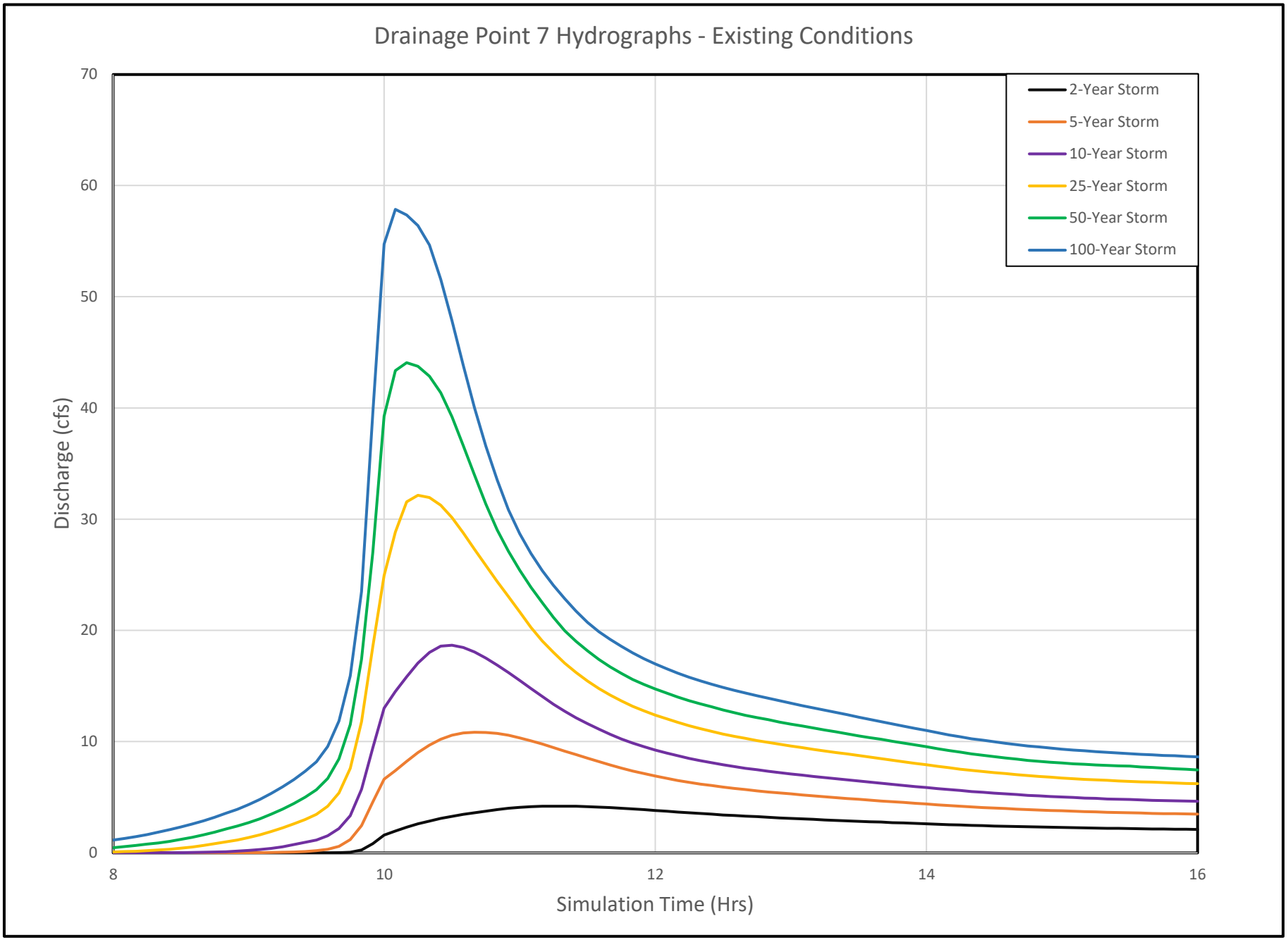

Drainage Point 4 Hydrographs - Proposed Conditions
Discharge (cfs)
700
600
500
400
300
200
100
0
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

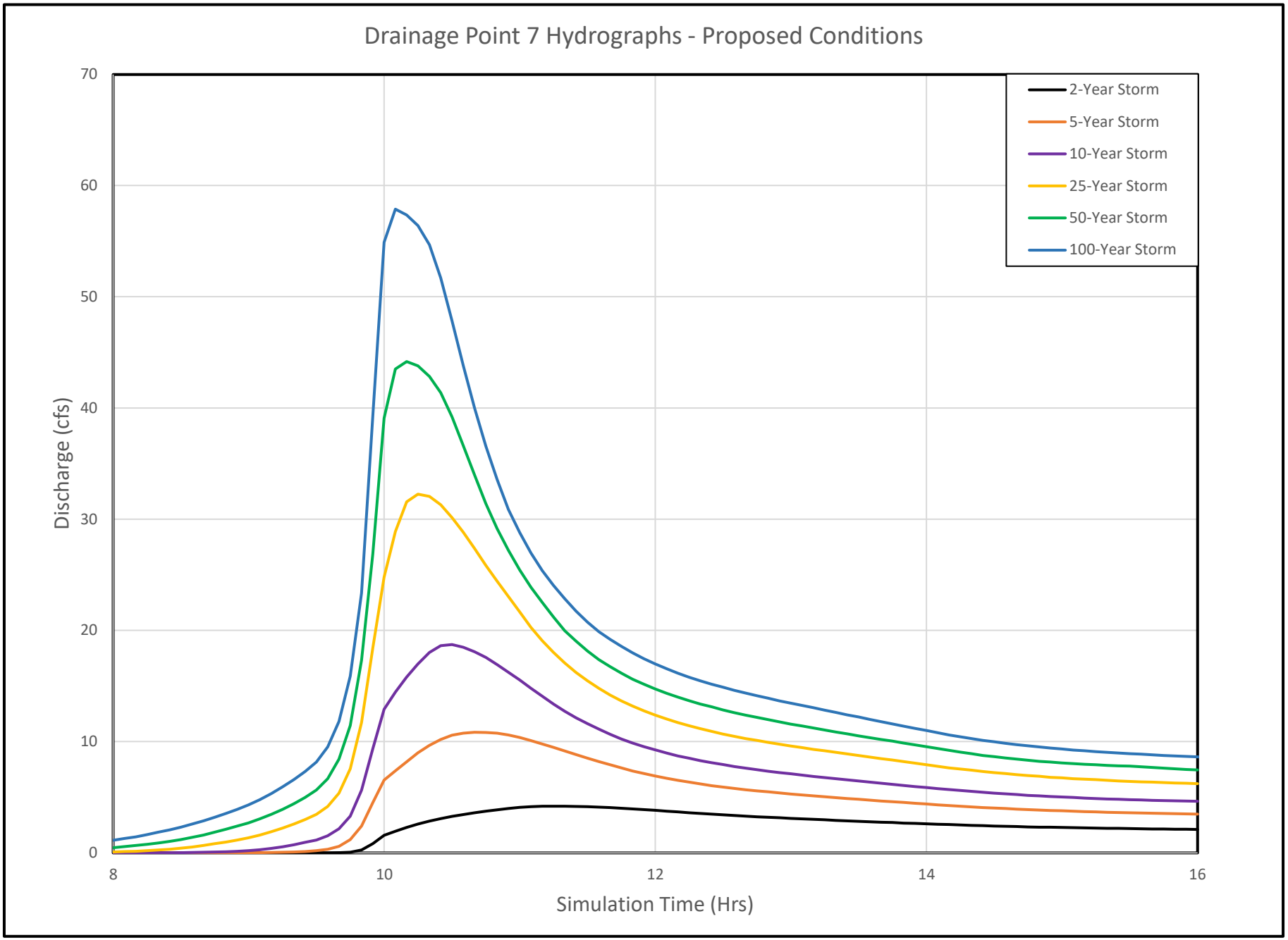

Drainage Point 5 Hydrographs - Existing Conditions
Discharge (cfs)
0
1
2
3
4
5
6
7
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

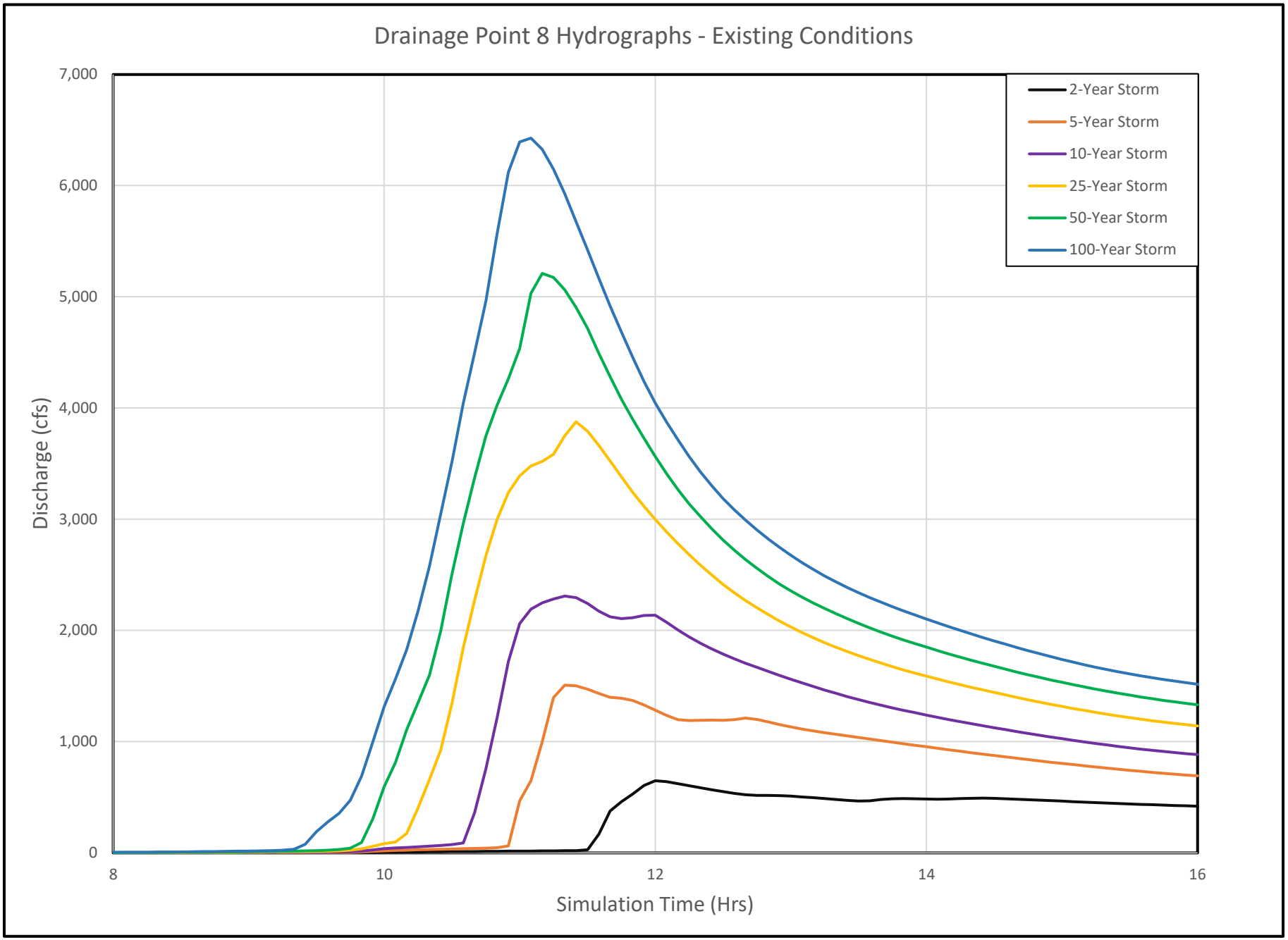

Drainage Point 5 Hydrographs - Proposed Conditions
Discharge (cfs)
700
600
500
400
300
200
100
0
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

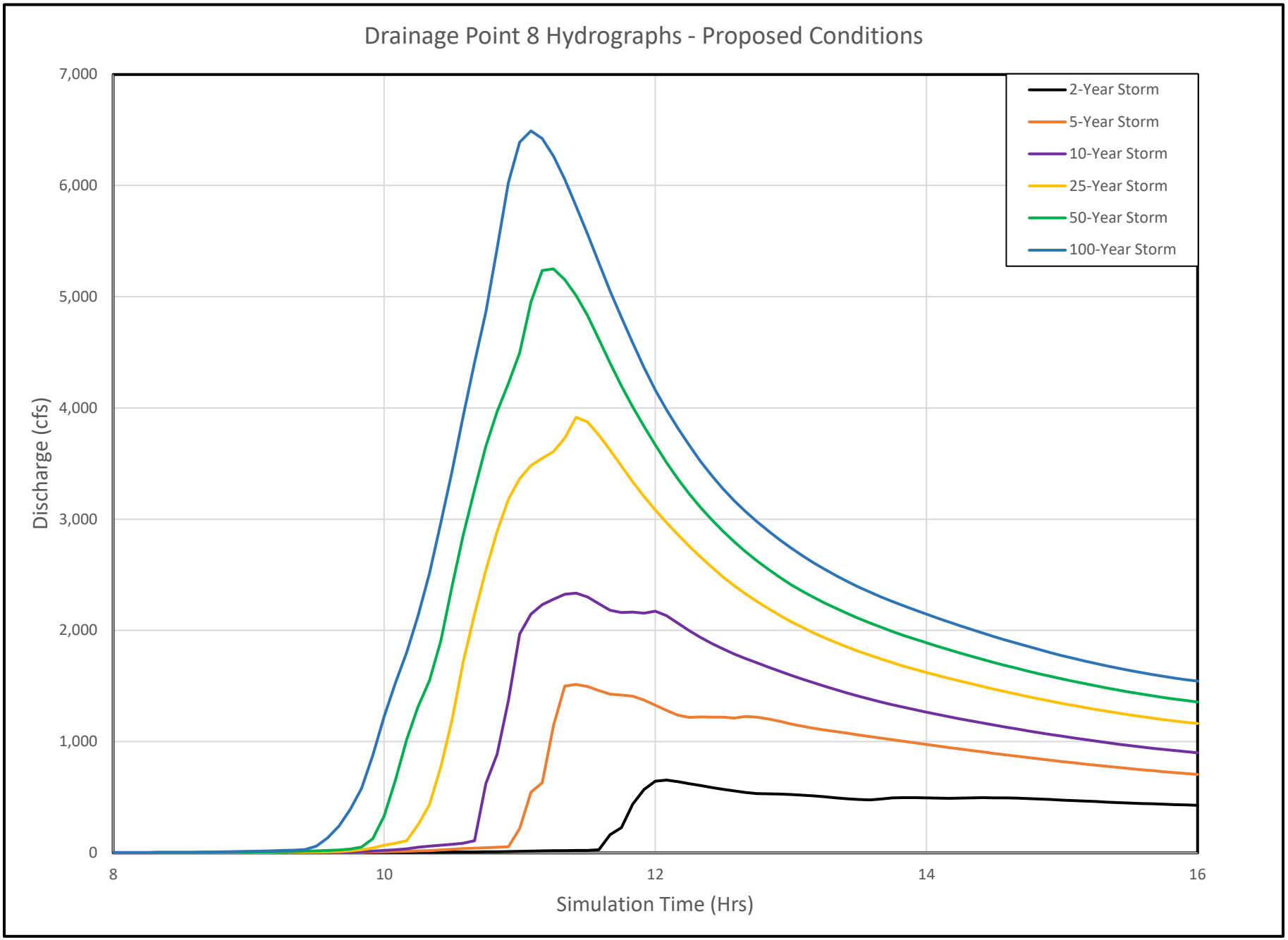

Drainage Point 6 Hydrographs - Existing Conditions
Discharge (cfs)
700
600
500
400
300
200
100
0
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

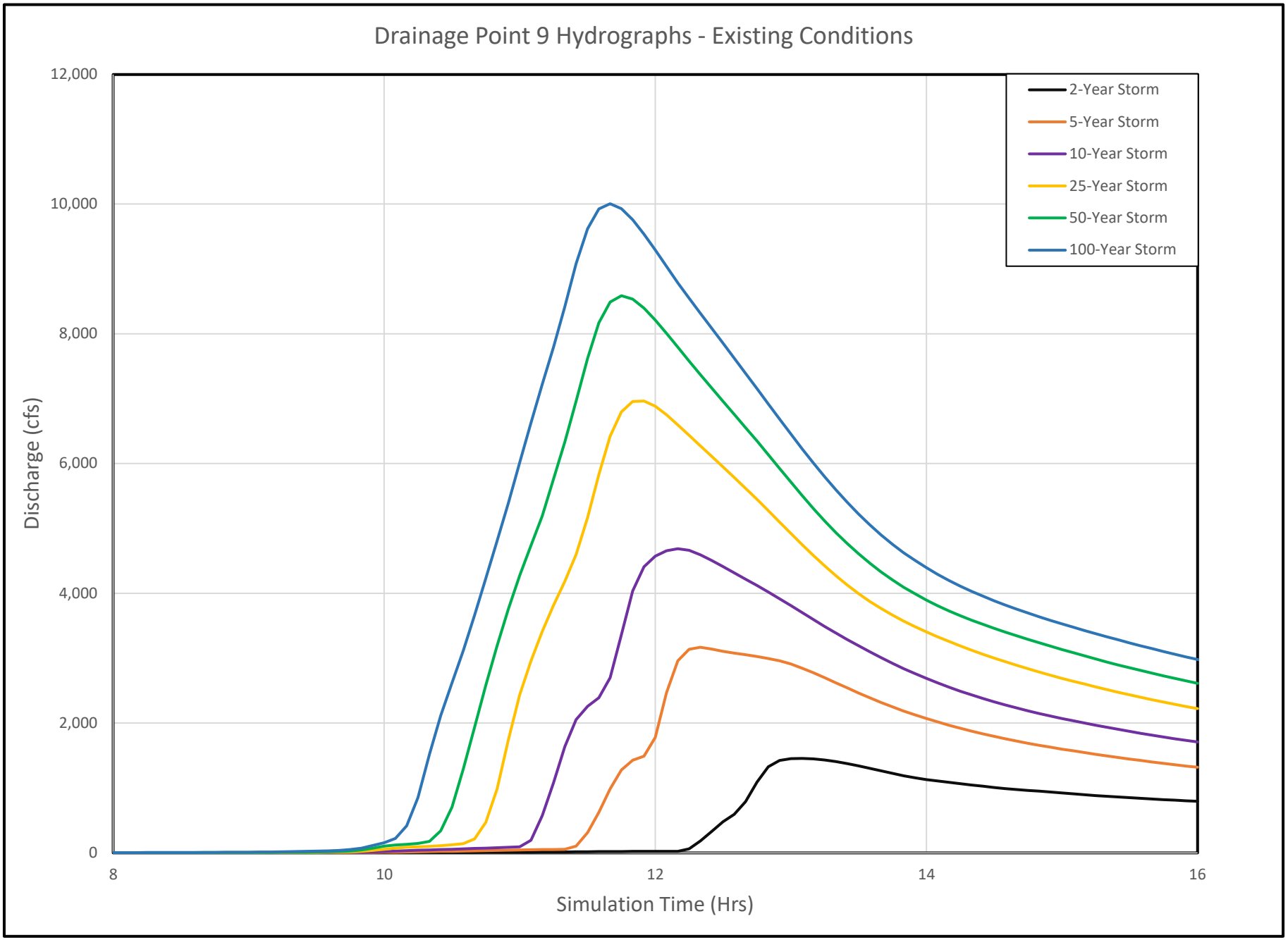

Drainage Point 6 Hydrographs - Proposed Conditions
Discharge (cfs)
700
600
500
400
300
200
100
0
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

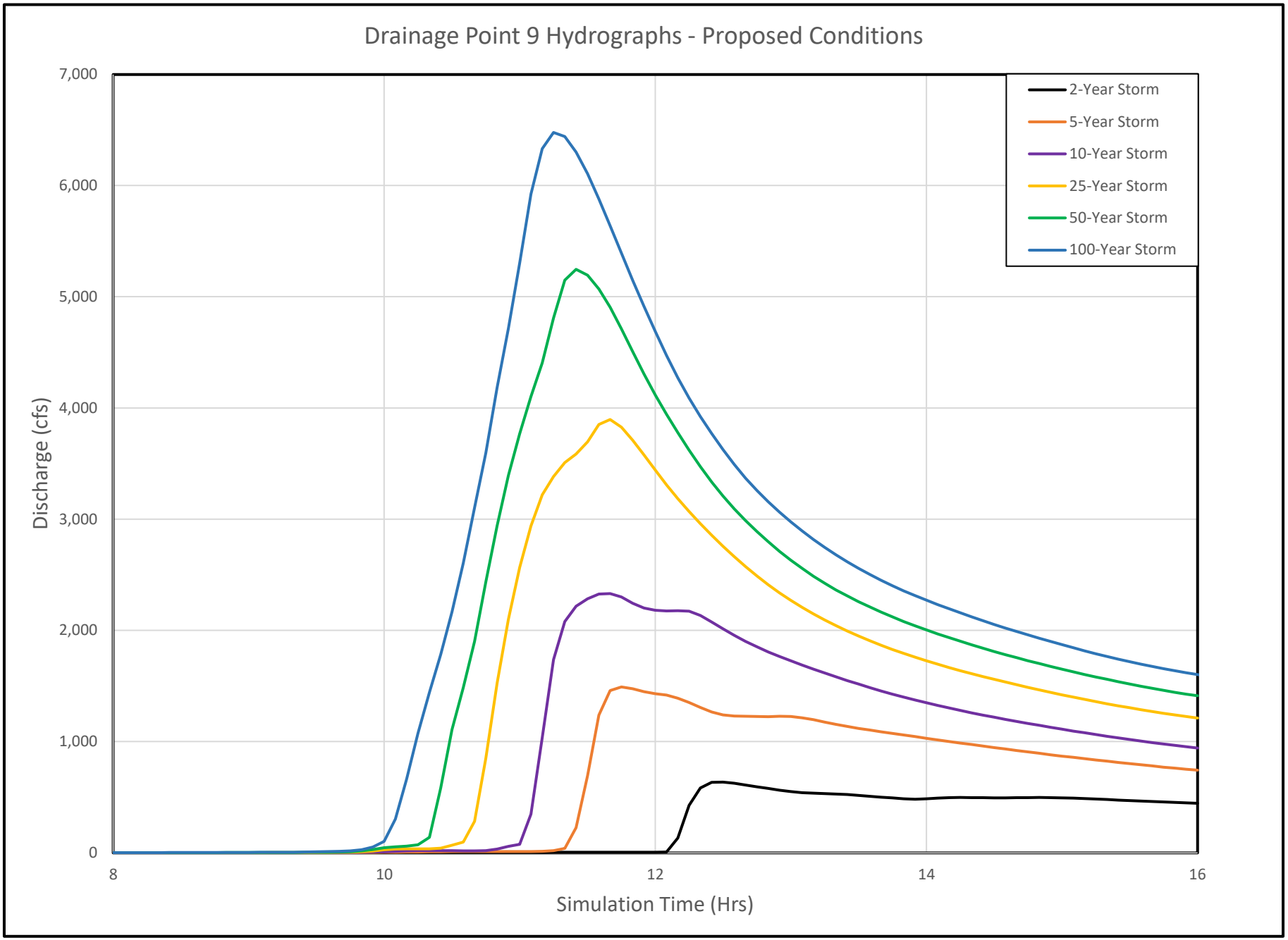

Drainage Point 7 Hydrographs - Existing Conditions
Discharge (cfs)
Simulation Time (Hrs)
0
10
20
30
40
50
60
70
8
10
12
14
16
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

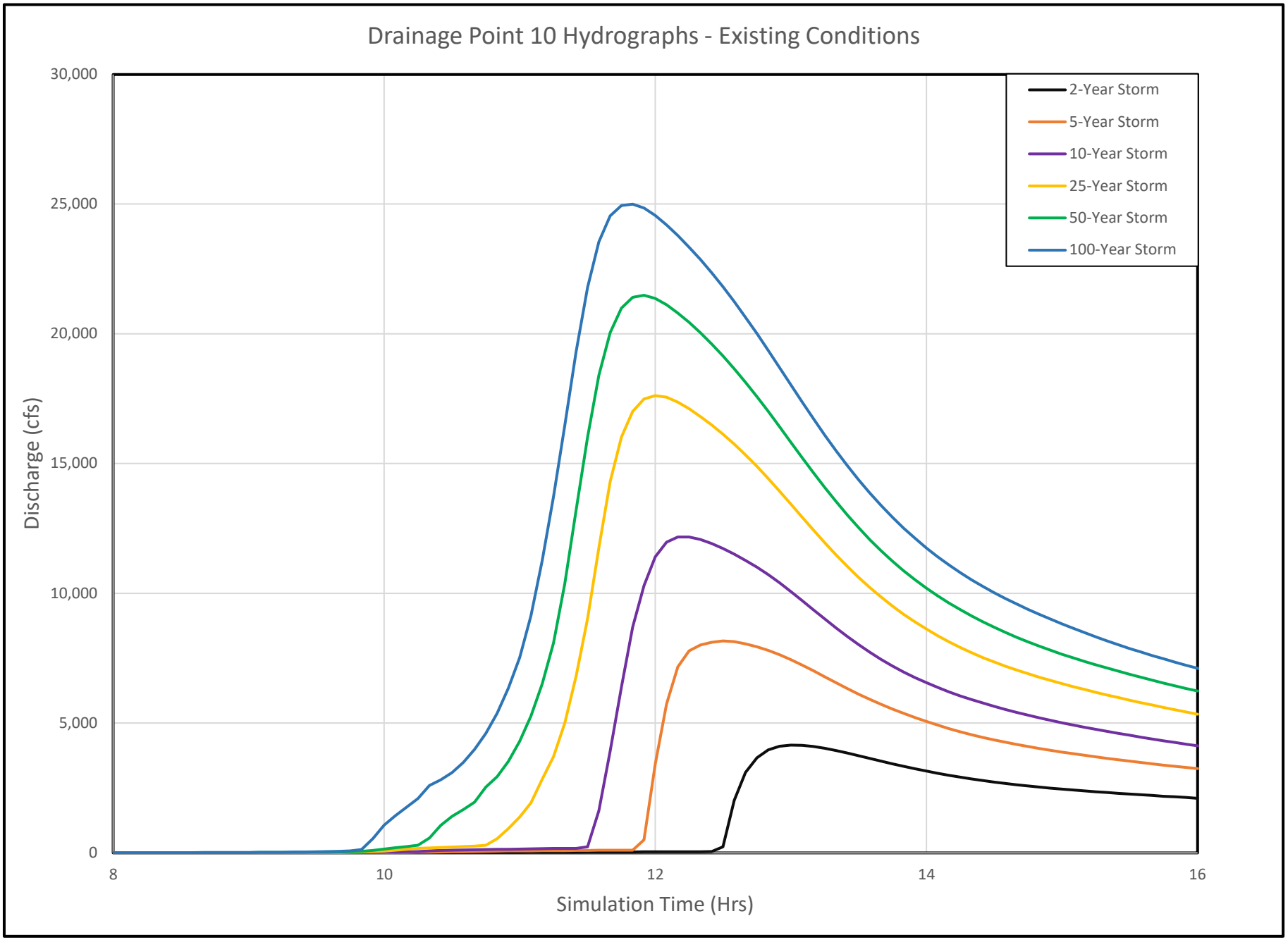

Drainage Point 7 Hydrographs - Proposed Conditions
Discharge (cfs)
Simulation Time (Hrs)
0
10
20
30
40
50
60
70
8
10
12
14
16
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

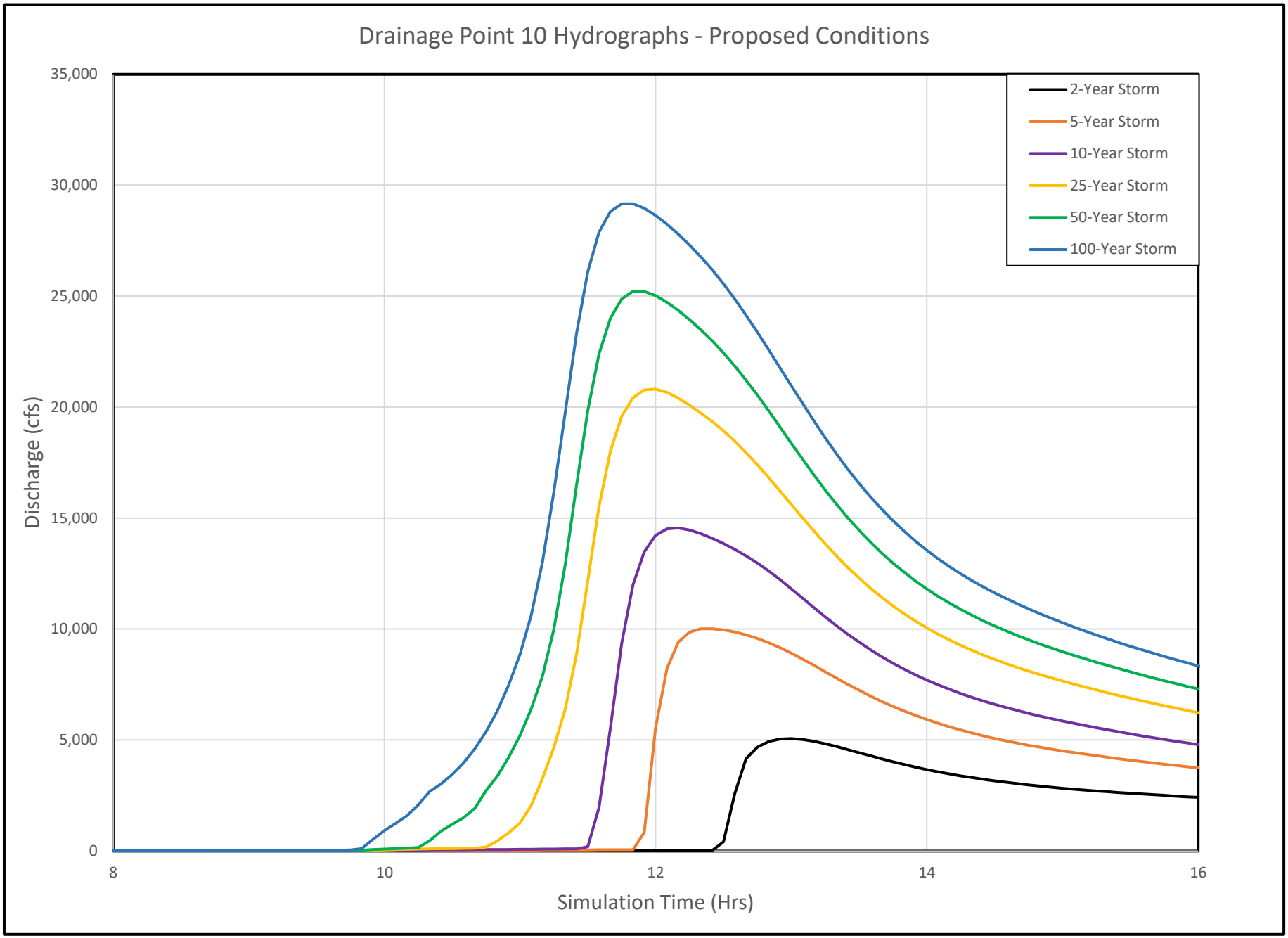

Drainage Point 8 Hydrographs - Existing Conditions
Discharge (cfs)
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm


Drainage Point 8 Hydrographs - Proposed Conditions
Discharge (cfs)
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm


Drainage Point 9 Hydrographs - Existing Conditions
12,000
10,000
8,000
6,000
4,000
2,000
0
Discharge (cfs)
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm


Drainage Point 9 Hydrographs - Proposed Conditions
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
Discharge (cfs)
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm


Drainage Point 10 Hydrographs - Existing Conditions
30,000
25,000
20,000
15,000
10,000
5,000
0
Discharge (cfs)
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm


Drainage Point 10 Hydrographs - Proposed Conditions
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Discharge (cfs)
8
10
12
14
16
Simulation Time (Hrs)
2-Year Storm
5-Year Storm
10-Year Storm
25-Year Storm
50-Year Storm
100-Year Storm

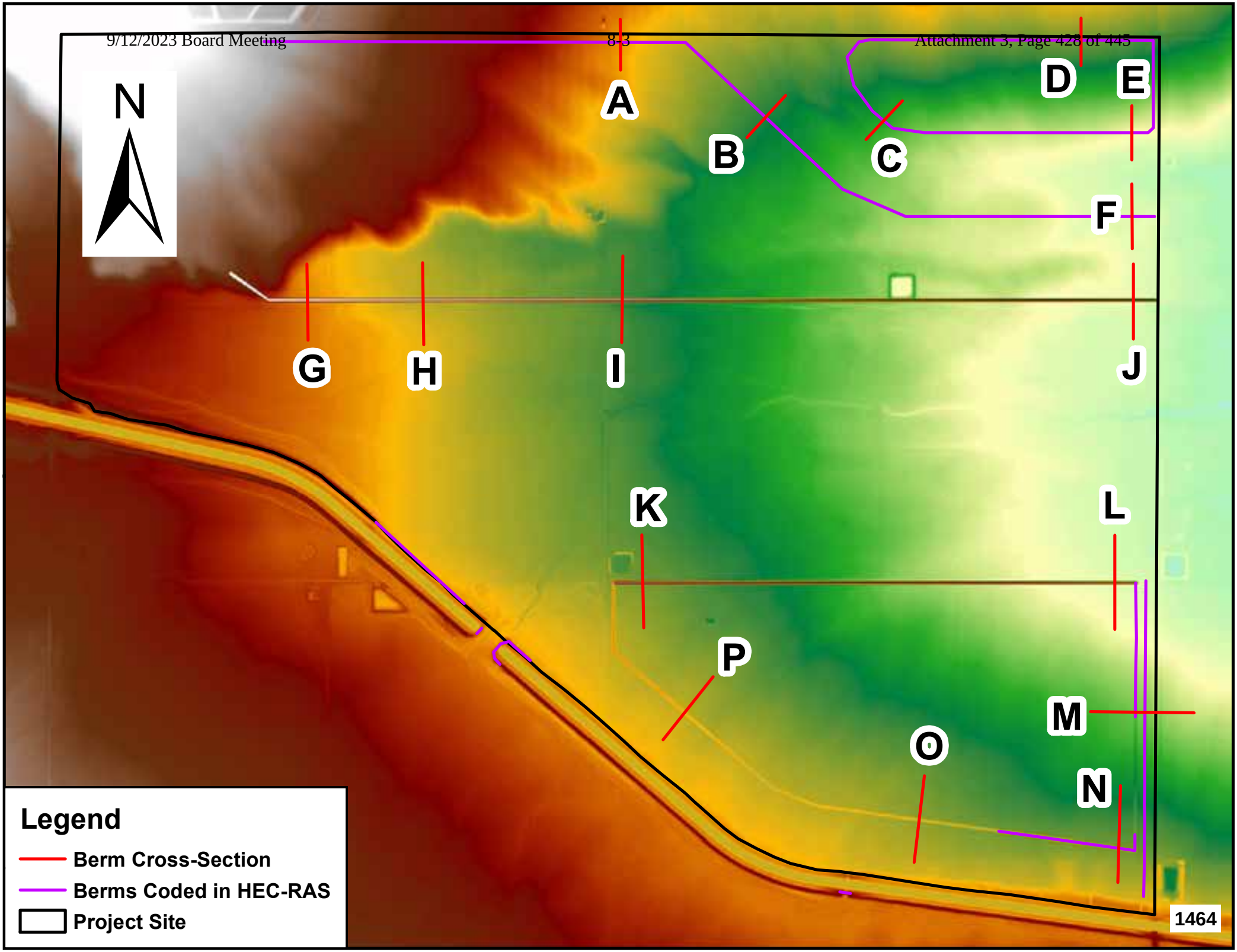
APPENDIX E

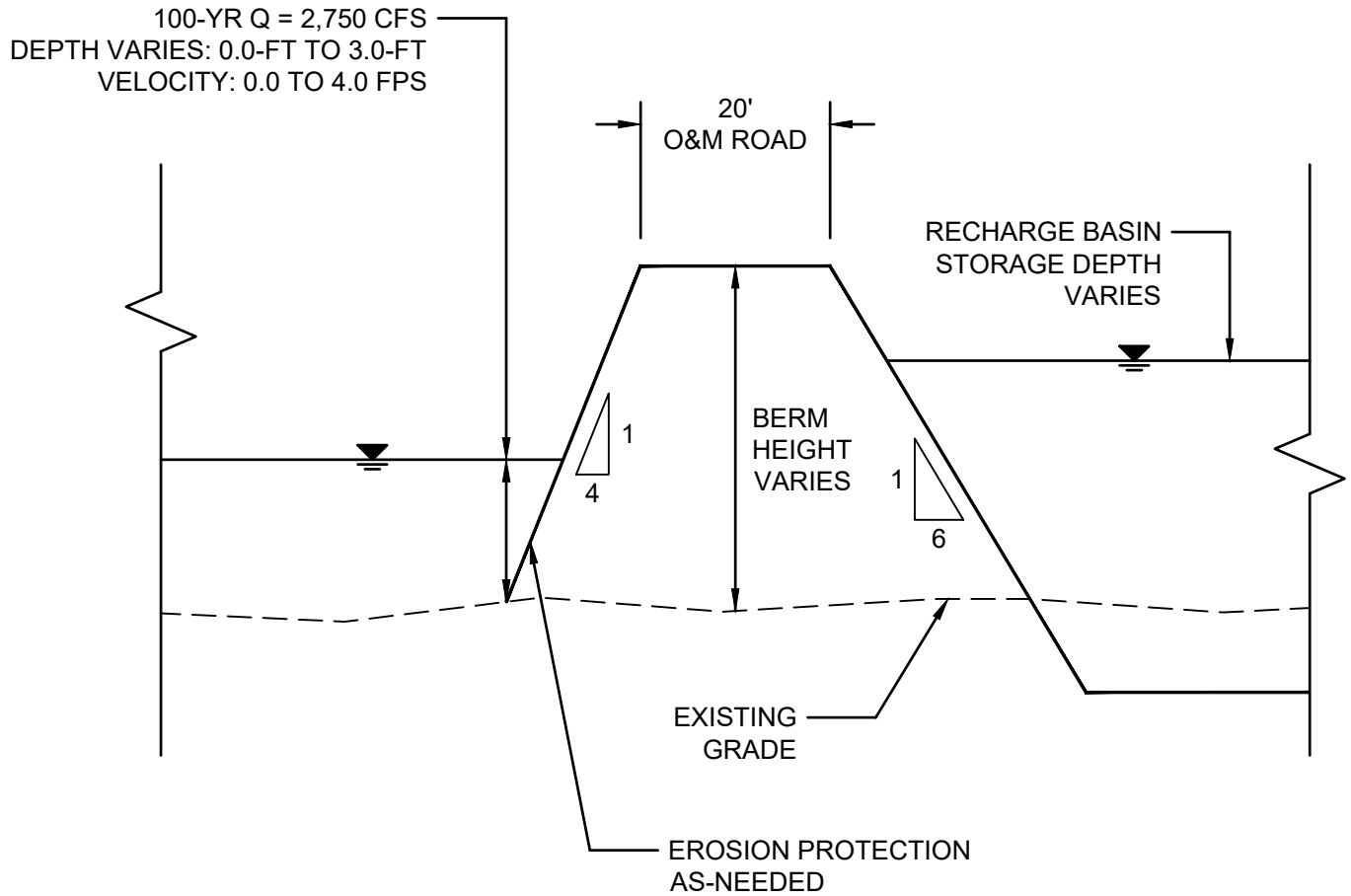
Digital Data

(Provided Digitally Only)

APPENDIX F

Preliminary Drainage Improvements


N
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Legend
Berm Cross-Section
Berms Coded in HEC-RAS
Project Site
1464



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

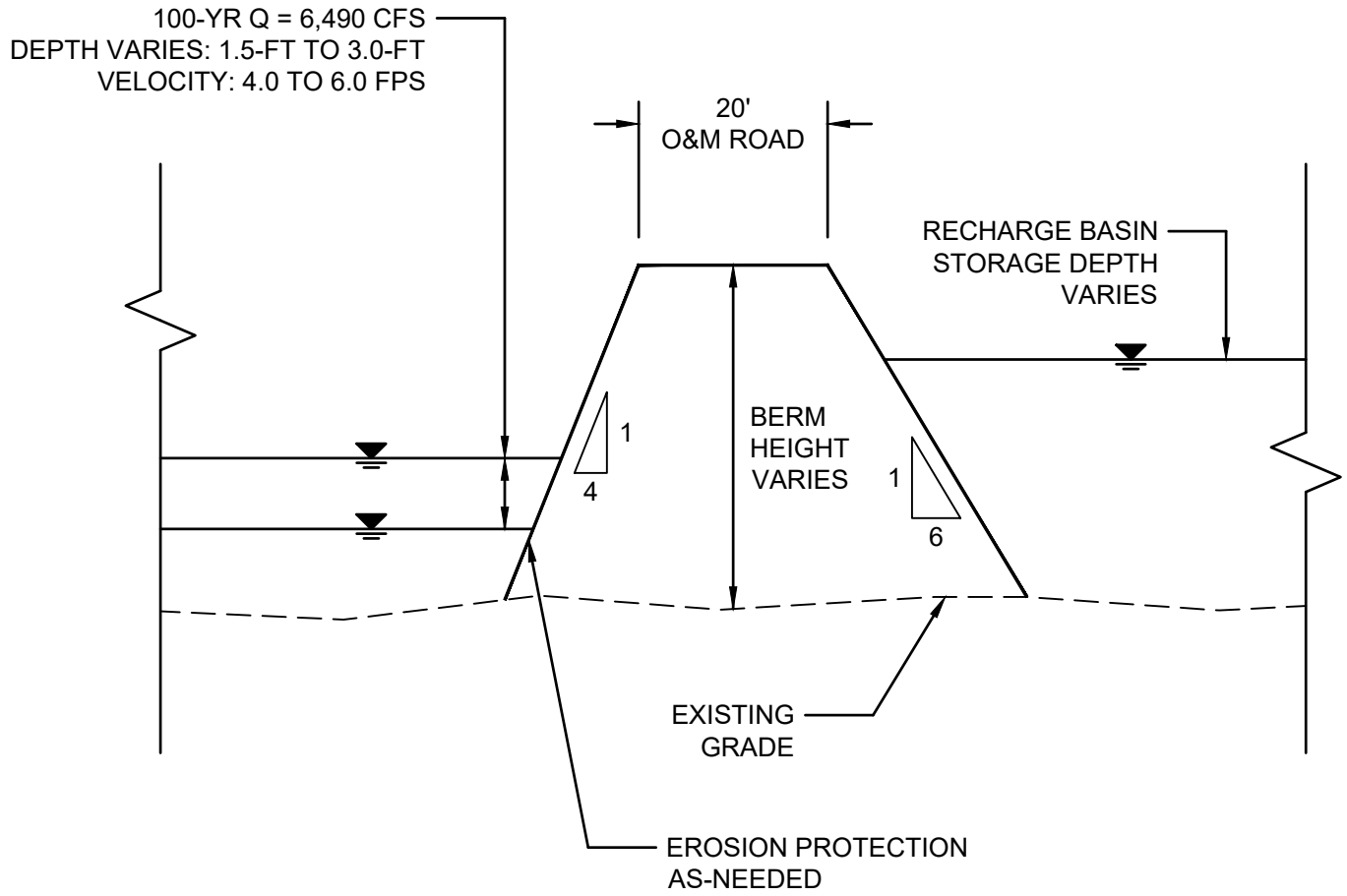
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS SECTION 'A'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

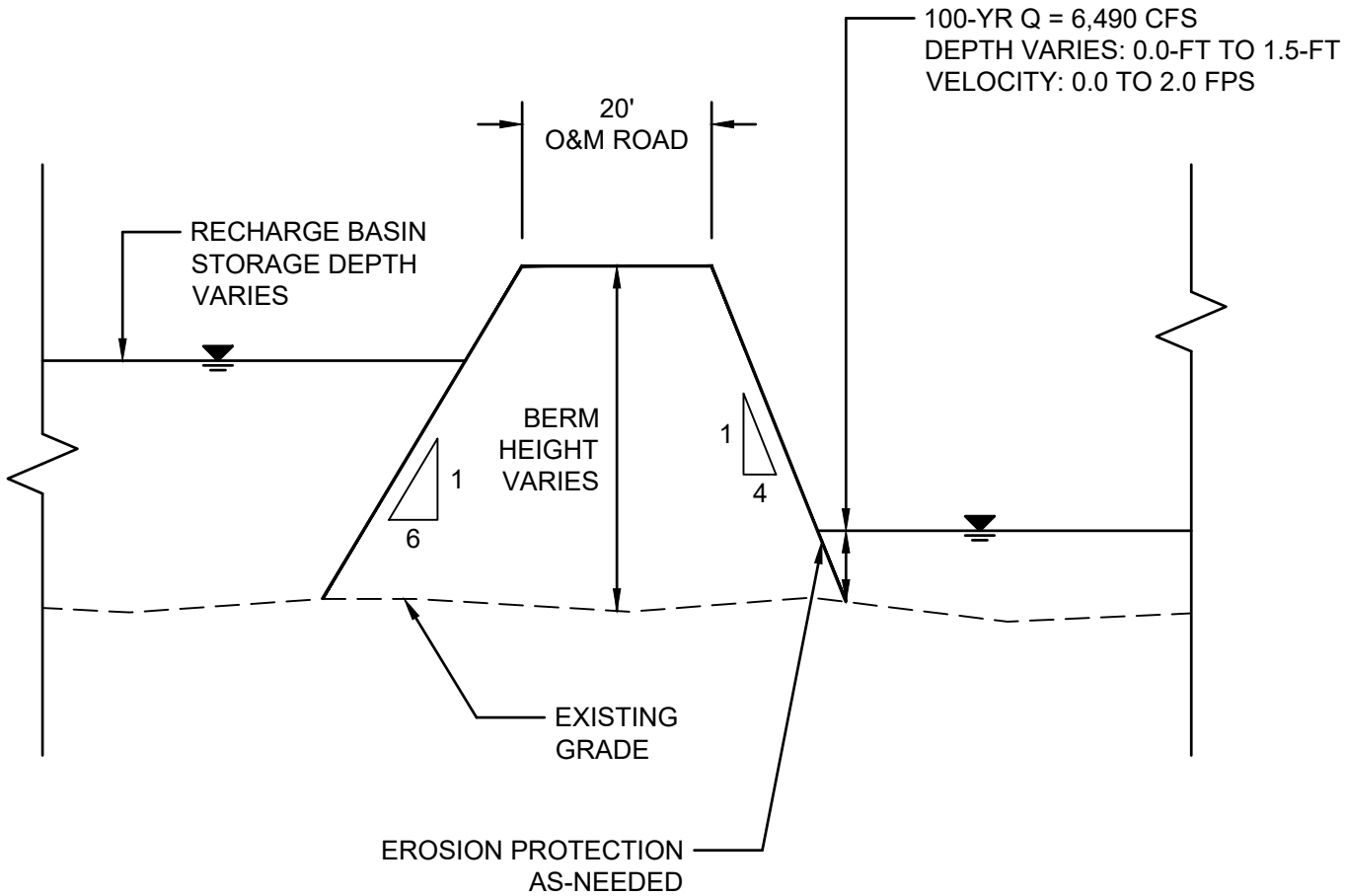
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS SECTION 'B'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

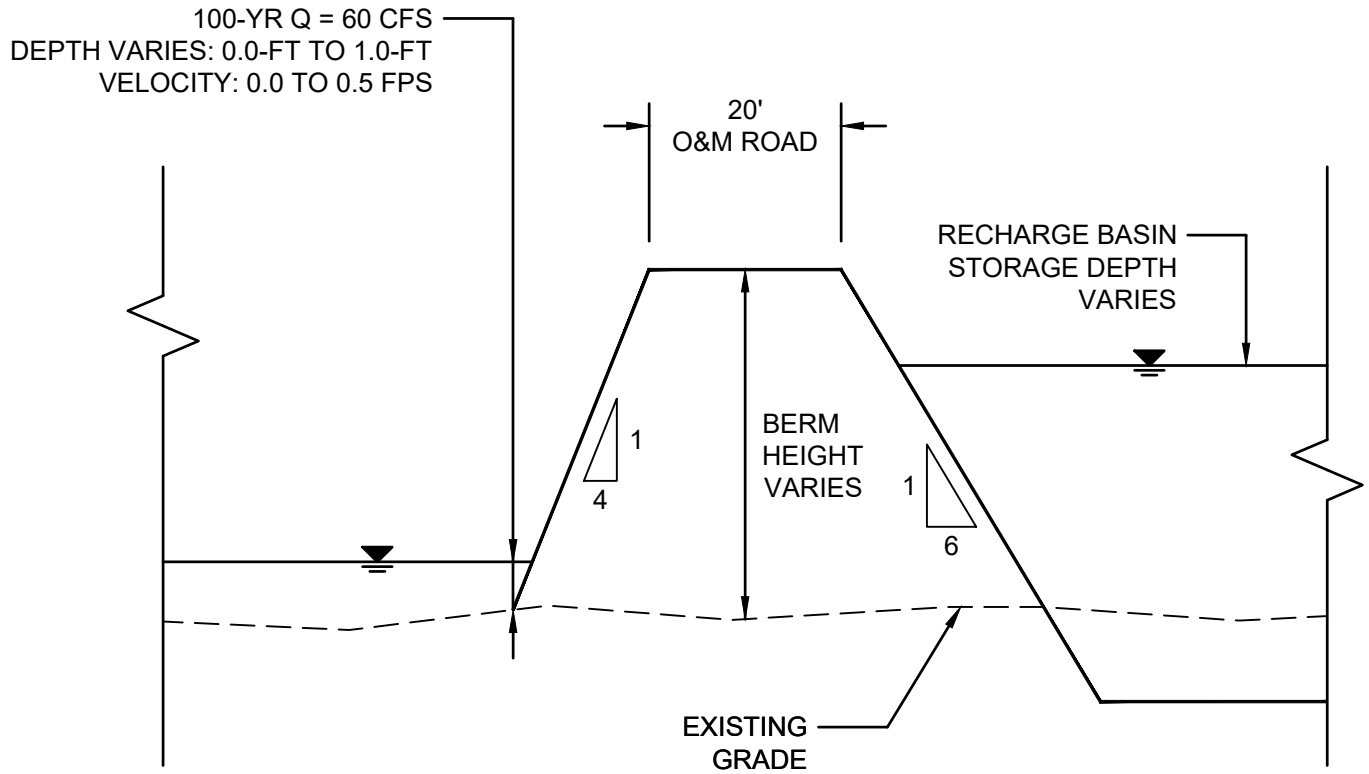
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS
SECTION 'C'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

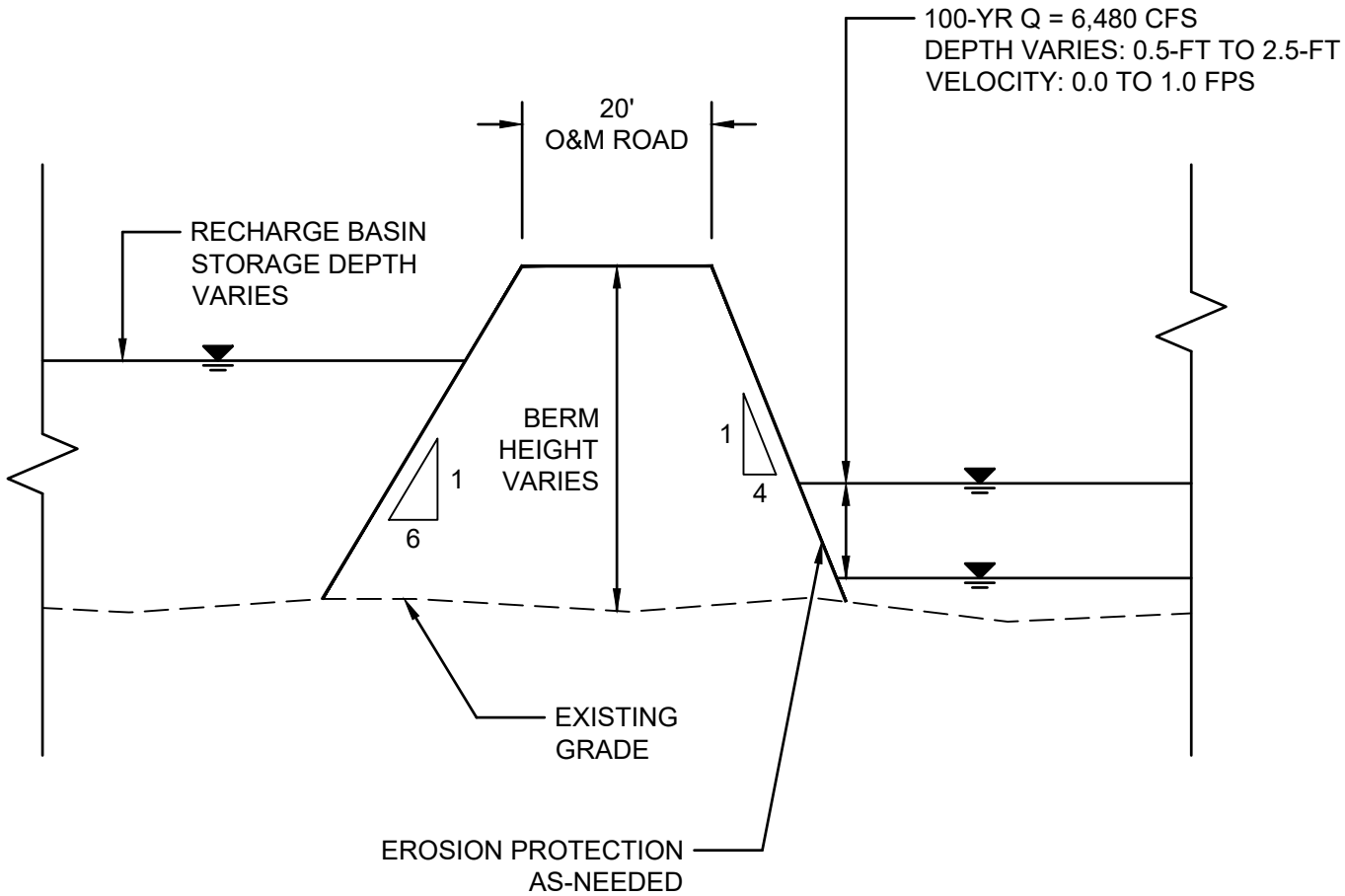
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS SECTION 'D'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

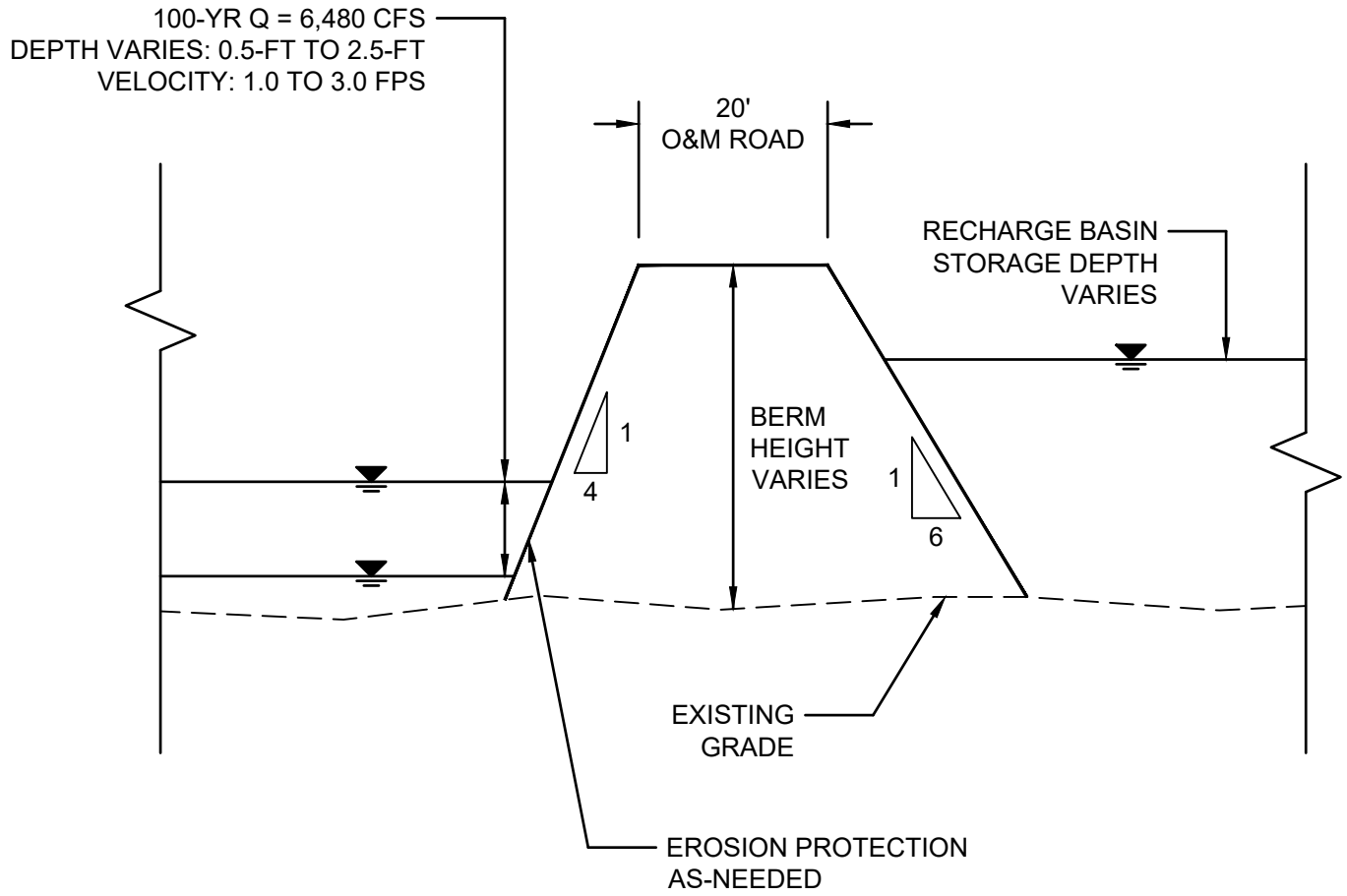
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS SECTION 'E'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

0 10 20 40 FT

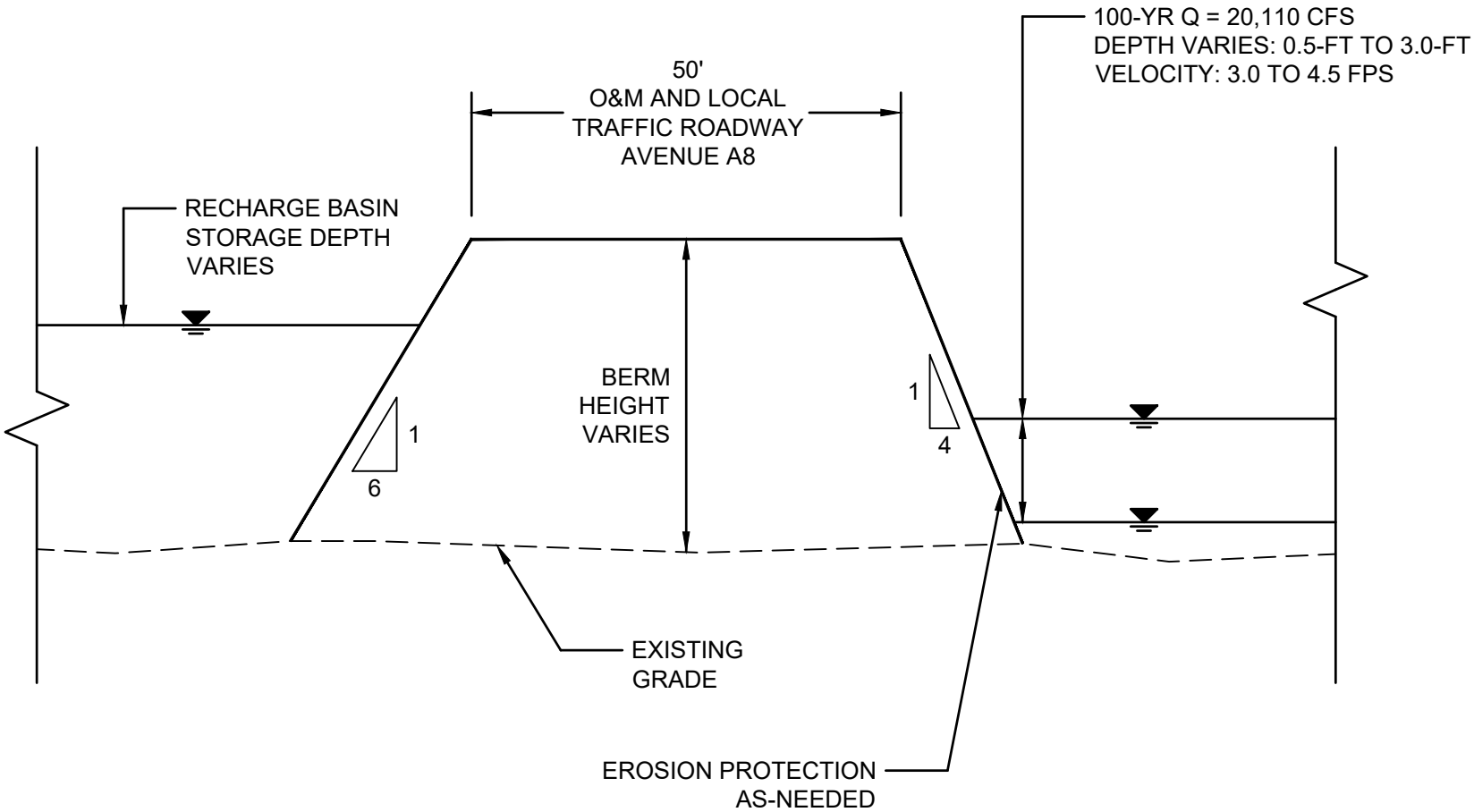
VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS

SECTION 'F'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

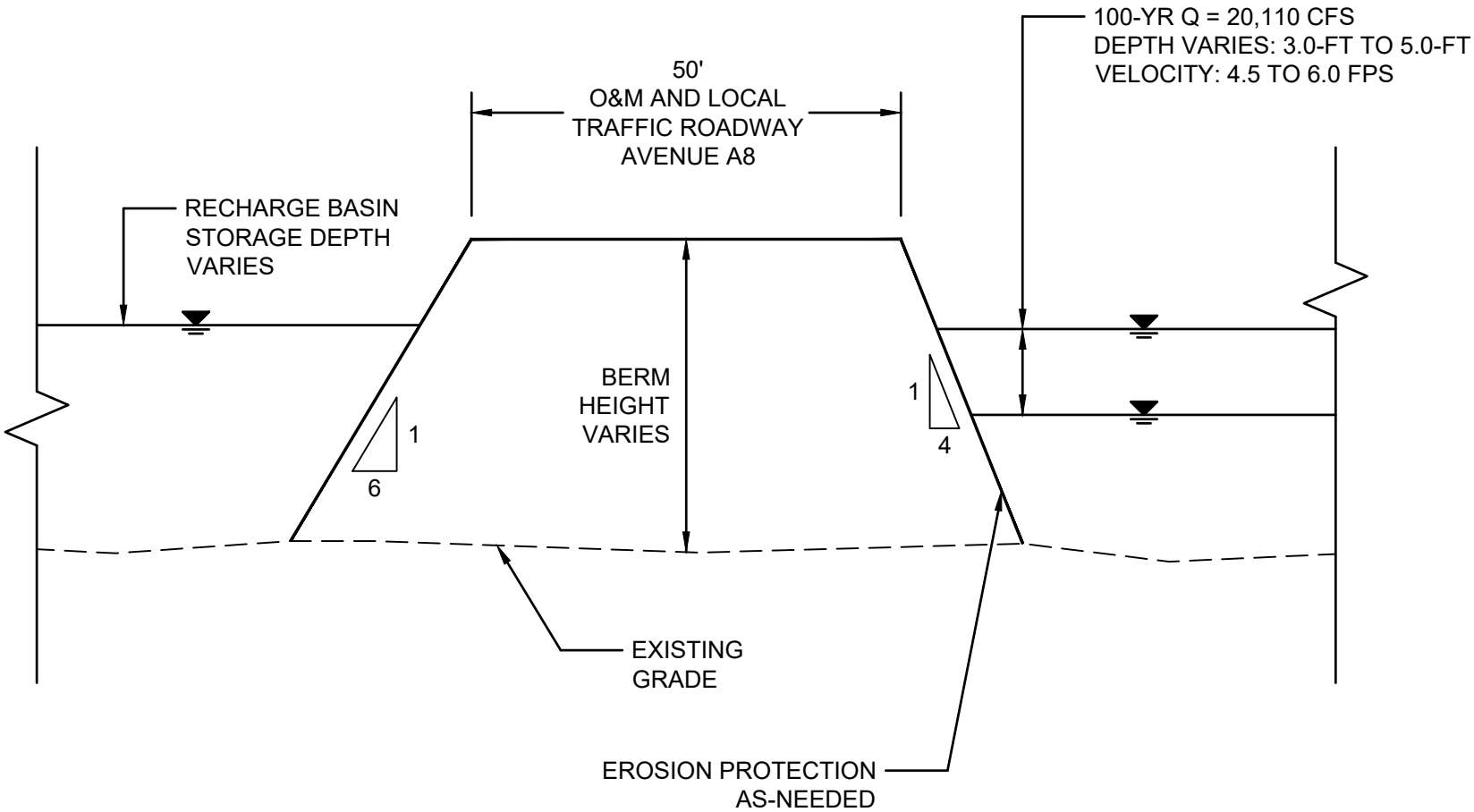
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS
SECTION 'G'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

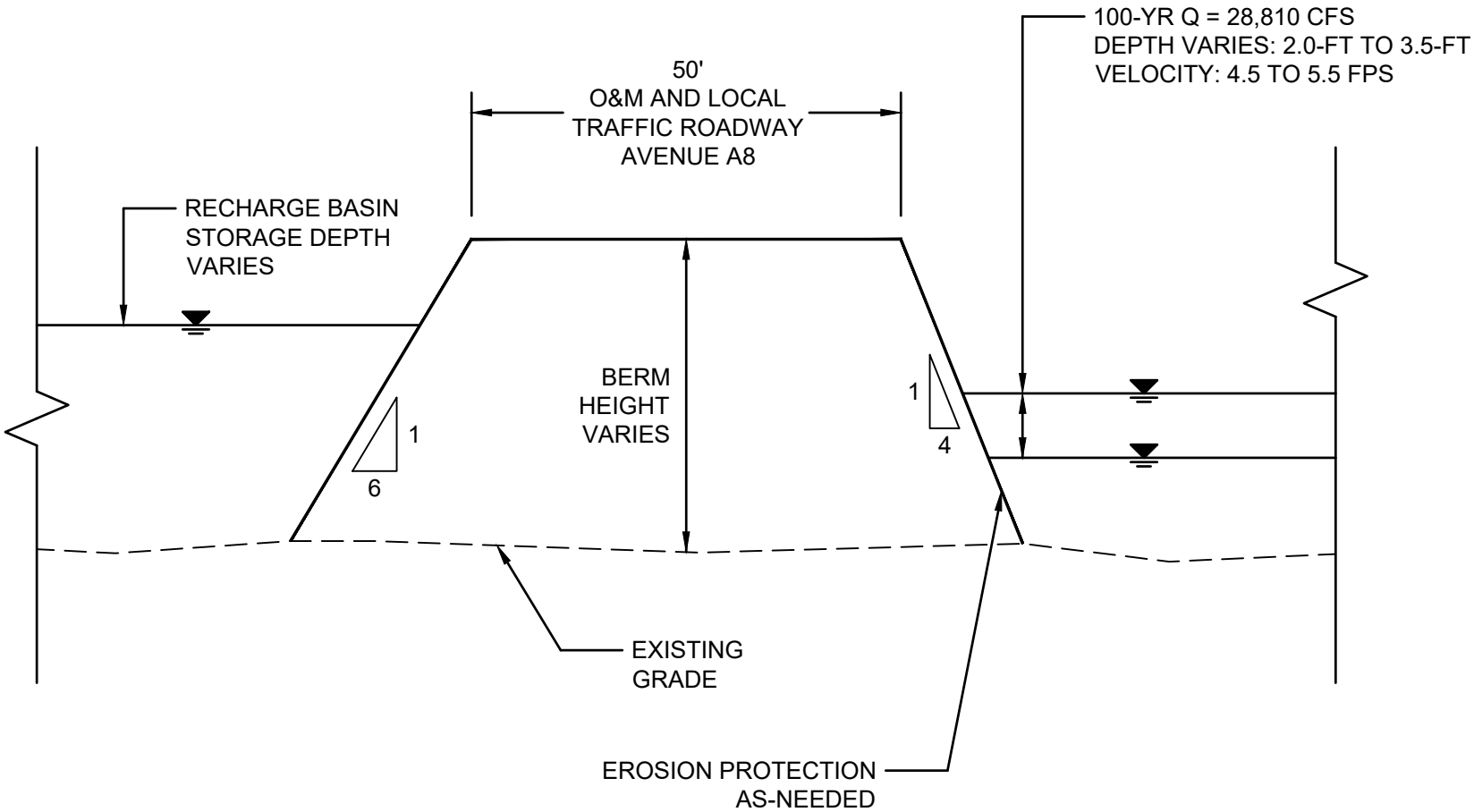
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS SECTION 'H'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

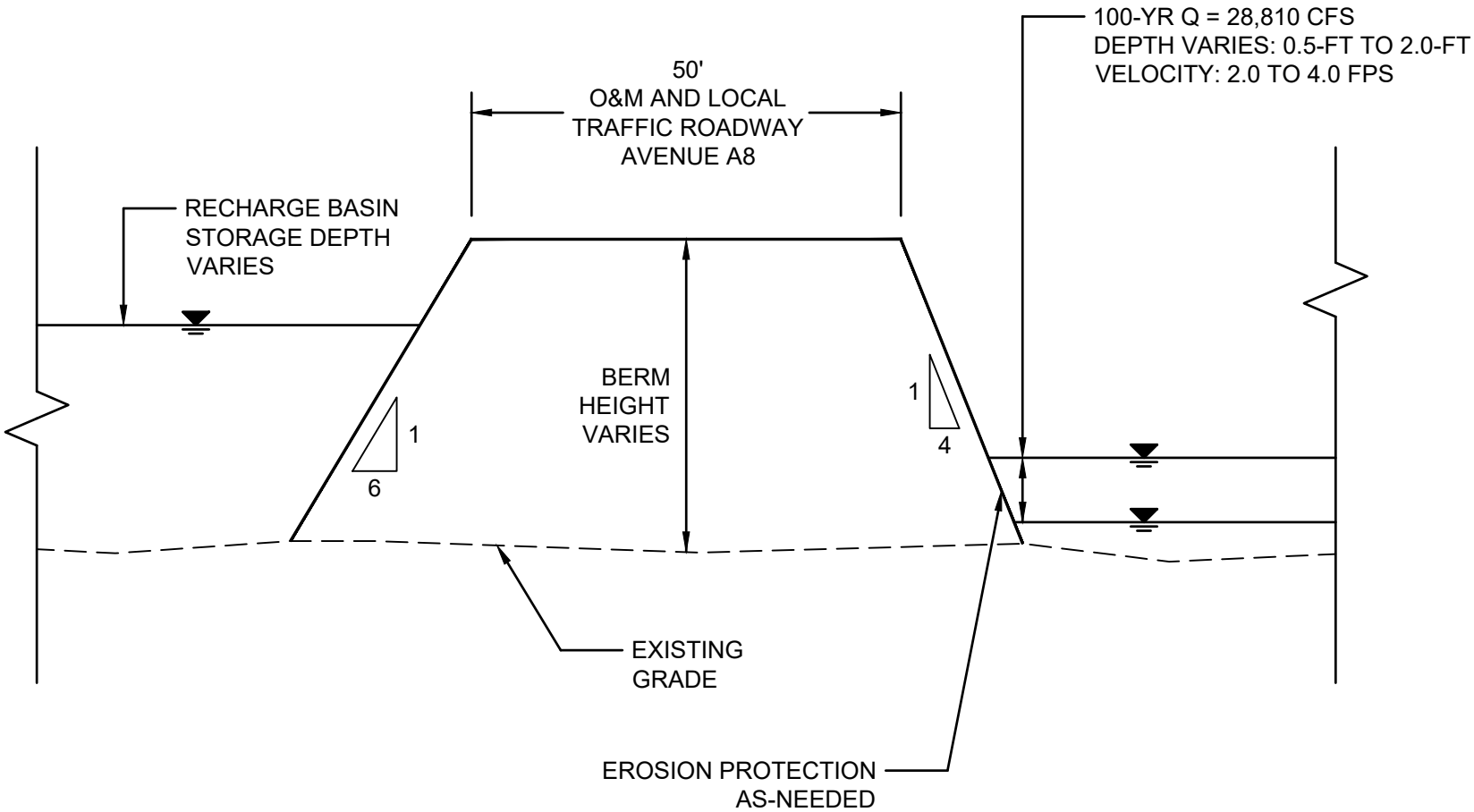
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS SECTION 'I'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

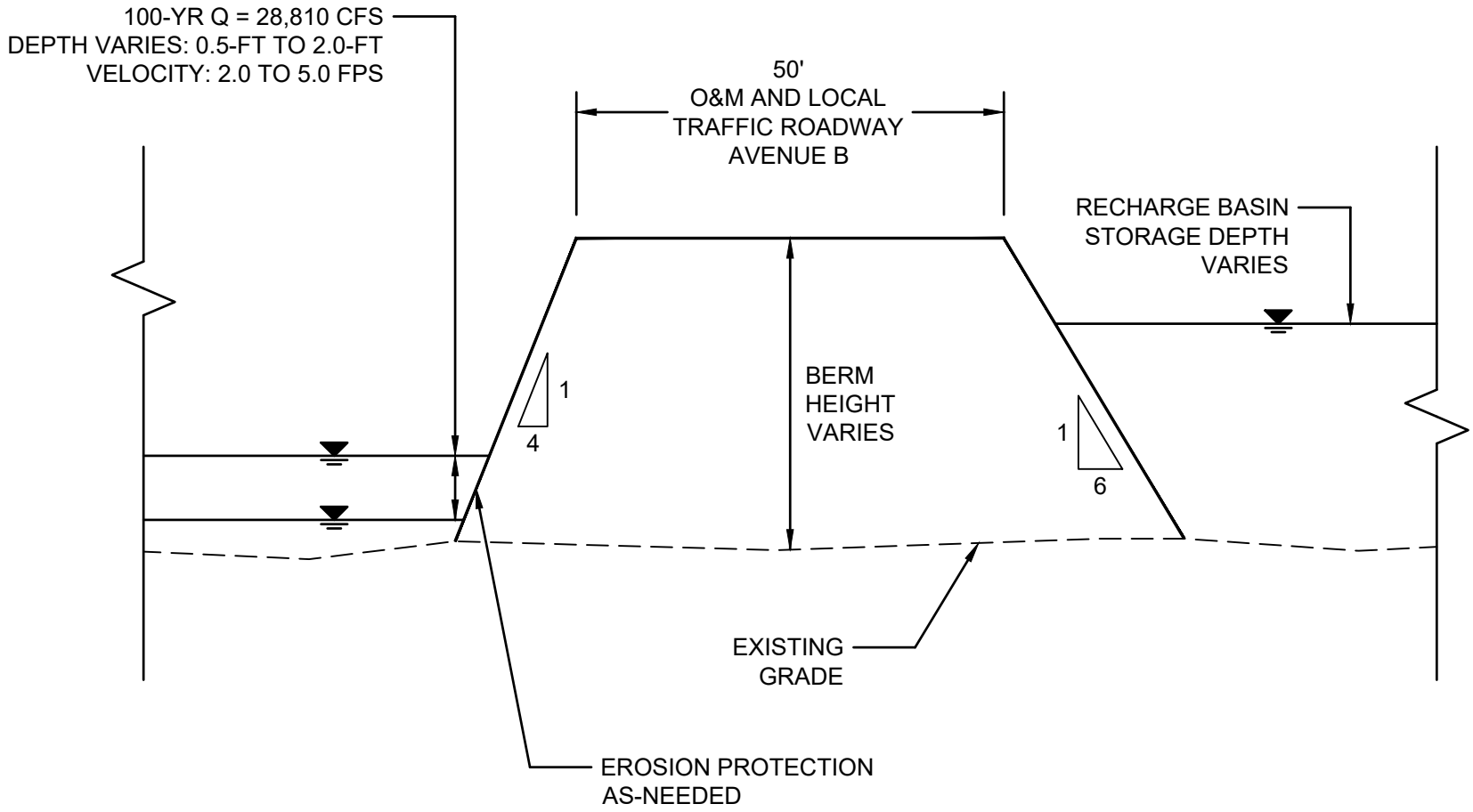
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS
SECTION 'J'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

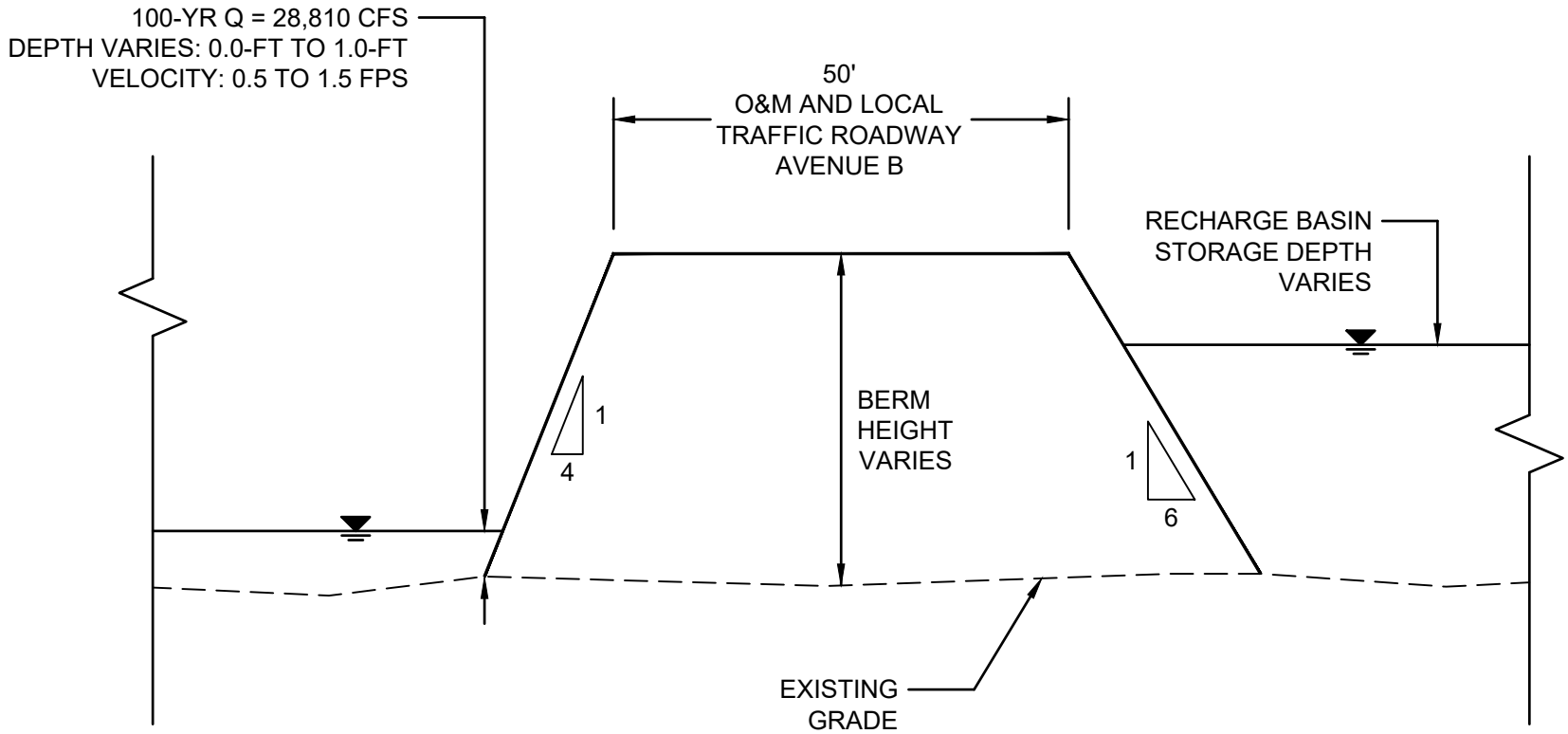
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS SECTION 'K'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

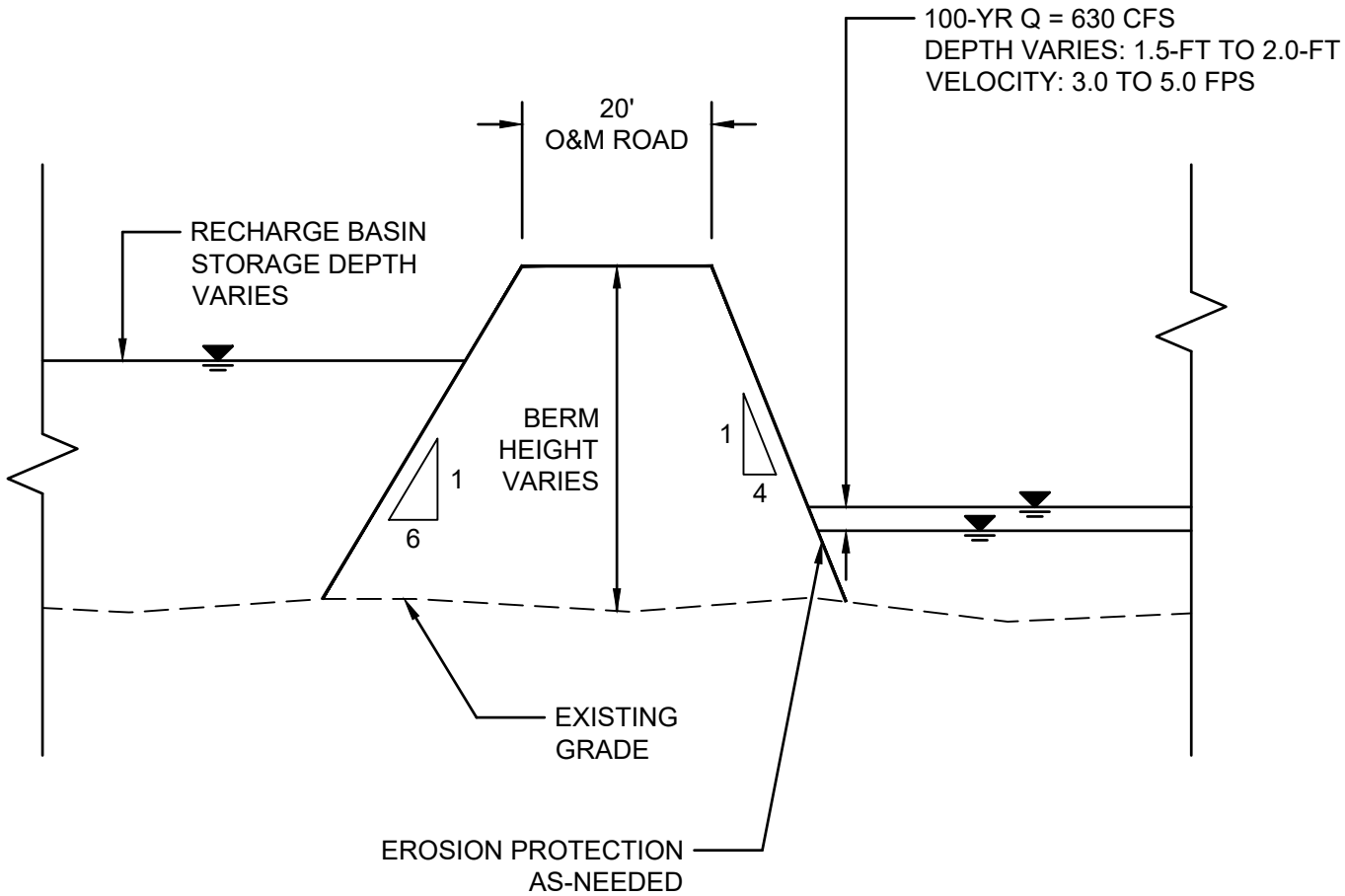
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS
SECTION 'L'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

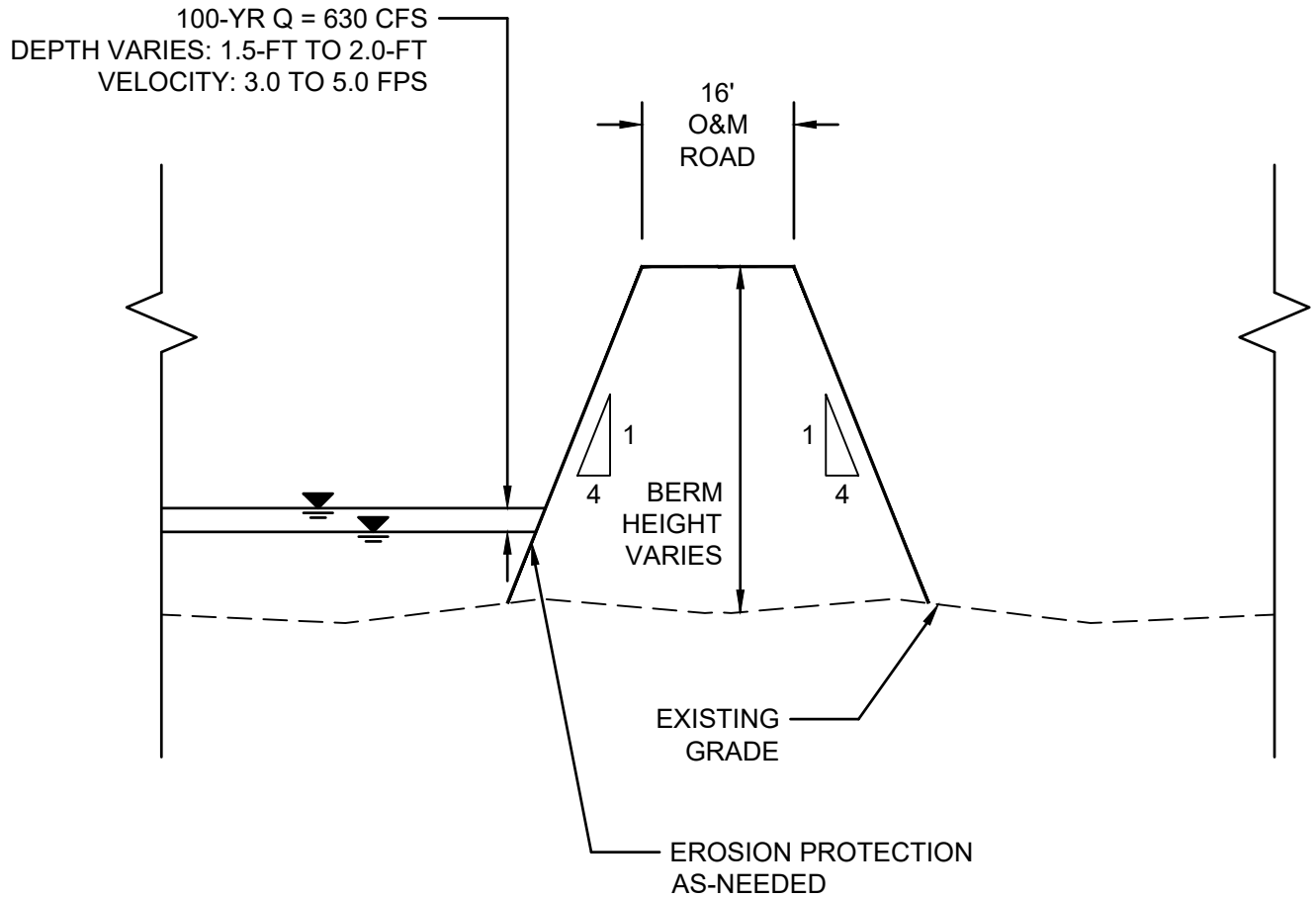
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS
SECTION 'M' (1 - LEFT BERM)



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

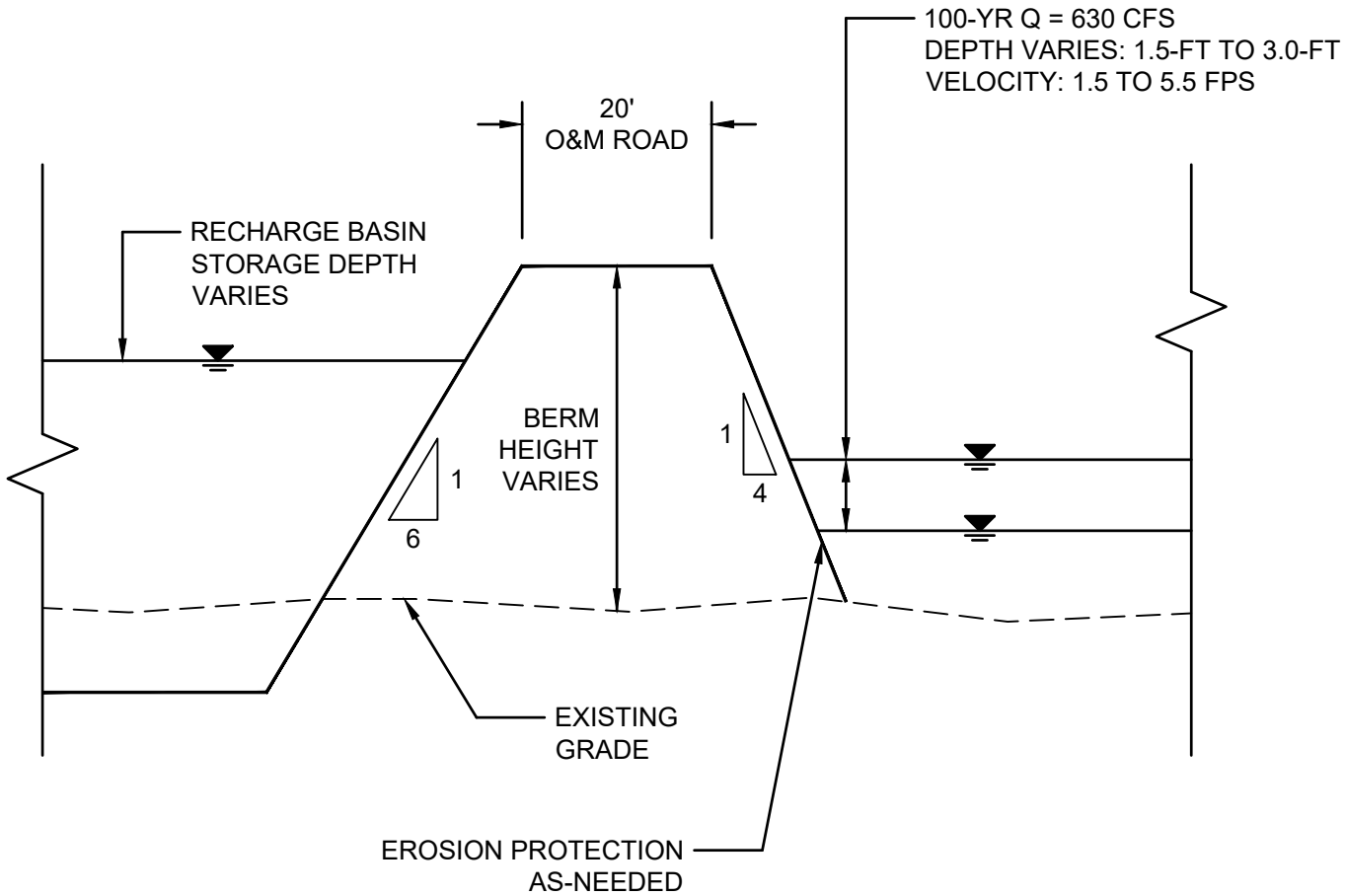
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS
SECTION 'M' (2 - RIGHT BERM)



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

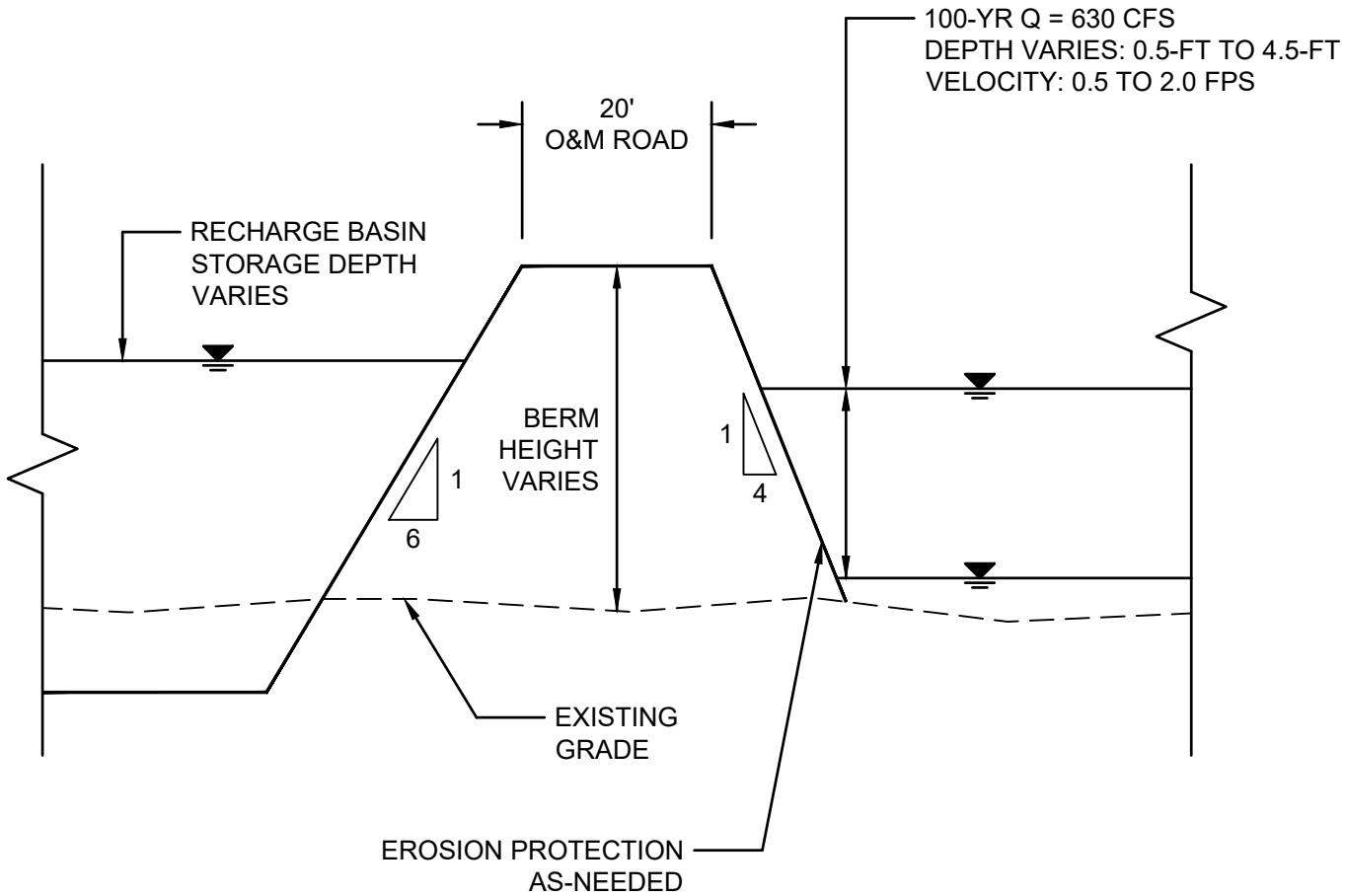
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS
SECTION 'N'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

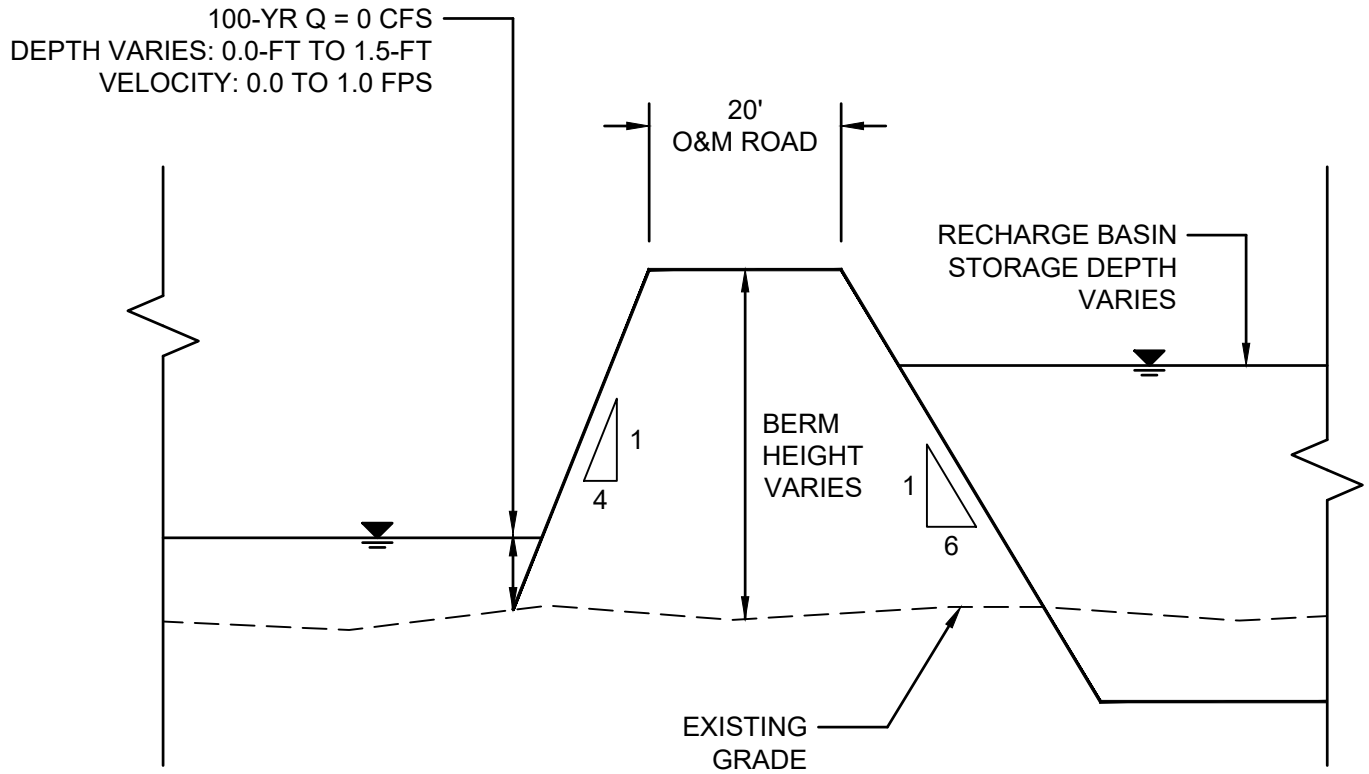
0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS
SECTION 'O'



NOTE: CROSS-SECTION DRAWN FROM THE PERSPECTIVE OF LOOKING DOWNSTREAM, OR IN THE DIRECTION OF THE STORMWATER FLOW.

HORIZONTAL SCALE: (1" = 20')

0 10 20 40 FT

VERTICAL SCALE: (1" = 4')

0 2 4 8 FT

APPENDIX F

PRELIMINARY DRAINAGE BERM IMPROVEMENTS
SECTION 'P'

2022 279121
FILED
Dec 29 2022
Dean C. Logan, Registrar – Recorder/County Clerk
Electronically signed by ANTHONY GARCIA

RESOLUTION NO. R-22-36

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE ANTELOPE VALLEY-EAST KERN WATER AGENCY ADOPTING AN ADDENDUM TO THE MITIGATED NEGATIVE DECLARATION FOR THE HIGH DESERT WATER BANK PROJECT PURSUANT TO THE CALIFORNIA ENVIRONMENTAL QUALITY ACT, AND APPROVING MODIFICATIONS TO THE PROJECT

WHEREAS, the Antelope-Valley-East Kern Water Agency ("Agency"), acting as the lead agency, undertook to prepare, pursuant to the California Environmental Quality Act ("CEQA") (Public Resources Code Section 21000 *et seq.*), and the State's CEQA Guidelines (California Code of Regulations, Title 14, Section 15000, *et seq.*), environmental documentation for the whole of the High Desert Water Bank project ("Project"); and

WHEREAS, the Project consists of the development and operation of a groundwater bank within a 1,500 acre site located west of 280th Street West, East of 300th Street West, north of the California Aqueduct, and south of Avenue A (Los Angeles/Kern County line) near the community of Neenach in northern Los Angeles County. The Project's groundwater bank will have a capacity of approximately 280,000 acre feet for the storage of State Water Project water.

WHEREAS, a draft Mitigated Negative Declaration and Initial Study for the Project was made available to the public and all interested parties for review and comment by publishing a Notice of Intent to Adopt a Mitigated Negative Declaration, which was circulated for public review and comment from June 14, 2017 through July 13, 2017 in accordance with CEQA; and

WHEREAS, the Agency prepared a Final Mitigated Negative Declaration, which includes the draft Mitigated Negative Declaration documentation and a Mitigation Monitoring and Reporting Plan; and

WHEREAS, on December 19, 2017, the Agency's Board of Directors received and considered all comments on the Final Mitigated Negative Declaration and on the Project; and

WHEREAS, at such meeting the Board of Directors adopted Resolution No. R-17-25 to adopt the Mitigated Negative Declaration and approve the Project; and

WHEREAS, since the Board of Directors' adoption of Resolution No. R-17-25, the Project's design team has recommended incorporation of a water quality treatment facility to the Project, while maintaining the overall size of the Project's capacity; and

WHEREAS, the Agency has caused an Addendum to the Mitigated Negative Declaration ("Addendum No. 2"), a copy of which is attached as Exhibit A and incorporated herein by reference, to be prepared for the Project modifications in accord with CEQA Guideline Section 15164; and

WHEREAS, the Addendum No. 2 need not be circulated for public review but is attached to the Mitigated Negative Declaration in accordance with CEQA Guideline Section 15164; and

WHEREAS, the Board of Directors has reviewed and considered the Addendum in conjunction with the Mitigated Negative Declaration; and

WHEREAS, the Board of Directors has reviewed the findings made in this Resolution and finds that they are based upon substantial evidence that has been presented to the Board in the record of the proceedings, including documents, staff reports, technical studies, plans, specifications, and other materials.

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of the Antelope Valley-East Kern Water Agency hereby resolves, orders, and determines as follows:

Section 1. The foregoing recitals are true and correct and constitute a material part of this Resolution.

Section 2. The Board of Directors has independently reviewed and considered the contents of the Addendum No. 2 prior to deciding whether to approve the Project modifications. The Board of Directors finds, in its independent judgment after considering all relevant evidence in the record of proceedings for the Project, including the information set forth in the Addendum No. 2, that only minor technical changes and additions are necessary for the Mitigated Negative Declaration, and that none of the conditions requiring preparation of an environmental impact report or subsequent negative declaration have occurred.

Section 3. The Board of Directors hereby adopts the Addendum No. 2 and approves the Project modifications as described in the Addendum No. 2 subject to completion of further design documents and other engineering requirements for the Project.

Section 4. The custodian of the documents and other materials that constitute the record of proceedings on which action on the Project and the Addendum No. 2 is based is Dwayne Chisam, General Manager of the Agency, and such documents are located at the Agency, at 6500 West Avenue N, Palmdale, California.

Section 5. The Board of Directors directs staff to file a Notice of Determination for the Addendum with the Los Angeles County Clerk.

Section 6. The President of the Board of Directors shall sign this Resolution and the Secretary of the Board of Directors shall attest and certify to the passage and adoption thereof.

2022 279121

FILED
Dec 29 2022

Dean C. Logan, Registrar-Recorder/County Clerk

Electronically signed by ANTHONY GARCIA

ADOPTED this 20th day of December, 2022.

President of the Board of Directors of the
Antelope Valley-East Kern Water Agency

ATTEST:

Secretary of the Board of Directors of the
Antelope Valley-East Kern Water Agency

2022 279121

FILED
Dec 29 2022

Dean C Logan, Registrar Recorder/County Clerk

Electronically signed by ANTHONY GARCIA

THIS NOTICE WAS POSTED
ON December 29 2022
UNTIL January 30 2023
REGISTRAR – RECORDER/COUNTY CLERK

Notice of Determination

Appendix D

To:

☒ Office of Planning and Research

U.S. Mail: P.O. Box 3044, Sacramento, CA 95812-3044

Street Address: 1400 Tenth St., Rm 113, Sacramento, CA 95814

☒ County Clerk
County of: Los Angeles
Address: 12400 Imperial Hwy
Norwalk, CA 90650

From:

Public Agency: Antelope Valley-East Kern Water Agency
Address: 6500 West Avenue N
Palmdale, CA 93551
Contact: Justin Livesay, Engineering Manager
Phone: 661-943-3201

Lead Agency (if differer
Address:
Contact:
Phone:

2022 279121
FILED
Dec 29 2022
Dean C. Logan, Registrar – Recorder/County Clerk
Electronically signed by ANTHONY GARCIA

SUBJECT: Filing of Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code.

State Clearinghouse Number (if submitted to State Clearinghouse): 2017061030

Project Title: High Desert Water Bank: Addendum #2 for the Facility's Arsenic Treatment Facility

Project Applicant: Antelope Valley-East Kern Water Agency

Project Location (include county): Los Angeles County

Project Description:

An addendum (Addendum 2) to the previously approved Mitigated Negative Declaration for the High Desert Water Bank project was prepared in accordance with CEQA guidelines to incorporate the minor project change of adding a Treatment Facility which results in no additional impacts and no changes to the feasibility of implementation of previously identified mitigation actions for the project as previously adopted. Addendum 2 was considered in conjunction with the previously adopted Mitigated Negative Declaration and adopted by Resolution of the Board of Directors.

This is to advise that the Antelope Valley-East Kern Water Agency has approved the above
(☒ Lead Agency or ☐ Responsible Agency)

described project on 12/20/2022 and has made the following determinations regarding the above
(date)
described project.

1. The project [☐ will ☒ will not] have a significant effect on the environment.
2. ☐ An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA.
   ☒ A Negative Declaration was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation measures [☒ were ☐ were not] made a condition of the approval of the project.
4. A mitigation reporting or monitoring plan [☒ was ☐ was not] adopted for this project.
5. A statement of Overriding Considerations [☐ was ☒ was not] adopted for this project.
6. Findings [☒ were ☐ were not] made pursuant to the provisions of CEQA.

This is to certify that the final EIR with comments and responses and record of project approval, or the negative Declaration, is available to the General Public at:
Lead Agency's office located at 6500 West Avenue N, Palmdale, CA 93551

Signature (Public Agency): For Dwayne Chisam Title: General Manager

Date: 12/20/2022 Date Received for filing at OPR:

Authority cited: Sections 21083, Public Resources Code.
Reference Section 21000-21174, Public Resources Code.

Revised 2011

High Desert Water Bank Water
INITIAL STUDY ADDENDUM NO. 2

Prepared for:

Antelope Valley – East Kern Water Agency
6500 West Avenue N
Palmdale, CA 93351

Prepared by:

Compass Consulting Enterprises, Inc.
114 Marilla Ave, No. 3
Avalon, CA 90704

November 2022

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1 INTRODUCTION

The Antelope Valley-East Kern Water Agency (the Agency) is proposing to construct an approximately 126 cubic feet per second (CFS) arsenic treatment facility that utilizes an oxidation, coagulation, sedimentation process in concrete-lined basins within a 55-acre area of its High Desert Water Bank (HDWB, Project) to reduce the arsenic levels in recovered water prior to pump-in to the State Water Project (Proposed Project Change). The proposed treatment facility would only be operated when the Project is in recovery operation, which is typically during dry years when customer demands exceed available supplies.

1.1 DESCRIPTION OF PREVIOUSLY APPROVED PROJECT

In December 2017 the Agency adopted a Mitigated Negative Declaration (MND, SCH Number 2017061030) that was based on an Initial Study prepared for the High Desert Water Bank.

The High Desert Water Bank involves the development and operation of a groundwater bank on approximately 1,500 acres of land in the western edges of the Antelope Valley. The Project would store State Water Project (SWP) water supplies from the Agency and other banking participants during wet weather year periods when supplies exceed demands and would recover the water for use by the Agency and its partners during dry weather years when demands exceed supplies and other times when there are disruptions to State Water Project supplies. Implementation of this project will require the construction of monitoring and production water wells, turnout(s) from the California Aqueduct, East Branch, underground and above ground pipelines, recharge basins, and water storage and booster pump facilities.

In October 2021, the Agency prepared Addendum No. 1 to the High Desert Water Bank Initial Study, in accordance with CEQA Guidelines Sections 15162 and 15164. The purpose of Addendum 1 was to evaluate various components of the Project design (identified in 2021 Addendum 1 as *2021 Revised Project Design*) that were changed and/or optimized since the time the environmental impacts of the original design were analyzed in 2017 (Project or 2017 Original Project Design). Addendum 1 concluded that none of the conditions described in CEQA Guidelines Section 15162 calling for preparation of a subsequent Initial Study/Mitigated Negative Declaration had occurred with respect to any of the Environmental Subject Areas in the most current CEQA Guidelines. Therefore, the Agency could approve an Addendum to the Initial Study under CEQA Guidelines Section 15164. The Agency's board approved Addendum 1 on October 26, 2021 and filed a Notice of Determination for Addendum 1 on December 13, 2021 (SCH Number 2021269205).

1.2 DESCRIPTION OF PROPOSED PROJECT CHANGE

During implementation of the well drilling and testing phase of the HDWB project in 2021 and 2022, it was discovered that arsenic naturally occurs in deeper portions of the aquifer across a wider range of the Project Site than originally anticipated during the December 2017 Original Initial Study and 2021 Addendum 1 preparation. Water quality testing of newly drilled wells identified that arsenic was discovered below 500 feet below ground surface (bgs) at between 11 and 19 micrograms per liter (ug/L). Water returned from the HDWB must meet certain water quality standards prior to being pumped back into the SWP.

The Department of Water Resources (DWR) operates a Non-Project Pump-In Program to introduce non-SWP water into the California Aqueduct to supplement normal surface water supplies originating in the

Sacramento-San Joaquin Delta region. Pump-in projects which have the potential to degrade the baseline historical water quality in the State Water Project are referred to a facilitation group of State Water Contractors to determine the impacts of the pump-in proposal to the baseline water quality and ultimately approve or disapprove the pump-in program. According to DWR, the average and maximum arsenic concentrations historically found in the SWP are 2 and 4 micrograms per liter, respectively. However, there is no set limit on the maximum allowable concentrations of any constituent to be pumped in as part of a pump-in program and instead, the overall effects of the program are considered when implementing a pump-in program.

The 2017 Original Project Design and 2021 Revised Project Design understood that arsenic levels in the groundwater would be higher than the SWP baseline, but the assumption was that arsenic would occur at low enough levels that when introduced into the SWP, blending would occur such that minimal or no degradation of the SWP water would occur that would impact downstream State Water Contractors, and thus be approved by the facilitation group. The 2021 Revised Project Design identified a set-aside area for a potential treatment facility if needed in the future, but the physical attributes of the treatment facility were not evaluated in the CEQA Initial Study for the 2017 Original Project Design or Addendum No. 1 that evaluated the 2021 Revised Project Design.

Data from the 2021 and 2022 site development suggest a fairly consistent arsenic concentration in newly drilled wells across the Project Site that DWR is unlikely to allow to be directly pumped back into the SWP, therefore, for the HDWB to return water to the SWP, the water would need to have at least a percentage of arsenic removed to a level where blending within SWP water would meet DWR water quality requirements. To reduce arsenic concentrations in recovered water prior to pump-in to the SWP the Agency is now proposing to construct an arsenic treatment facility that utilizes an oxidation, coagulation, sedimentation process in concrete-lined basins within a 55-acre area of its HDWB. This Addendum No. 2 to the High Desert Water Bank Initial Study compiles the necessary information required to update the Agency's CEQA environmental review process for the Project's Treatment System in accordance with Sections 15162 and 15164 of the State CEQA Guidelines.

2 PROJECT DESCRIPTION

2.1 PROJECT LOCATION

The HDWB is being constructed on an approximately 1,500- acre site in Los Angeles County bounded by:

- Avenue A (Kern / Los Angeles County Line) on the north,
- 300th Street West on the west,
- 280th Street West on the east, and
- The California Aqueduct on the south.

This HDWB area is located in Sections 1, 2, 11, and 12 of Township 8 North, Range 17 West, northwest of the community of Neenach (**Figure 1: *HDWB Regional Location*** and **Figure 2: *HDWB Location - Aerial***).

The subject of this Addendum No. 2 to the HDWB Project Initial Study is the incorporation of a Treatment Facility (Proposed Project) specifically targeting the removal of naturally occurring arsenic from recovered groundwater. The Treatment Facility would be located within 55 acres of the HDWB, near the intersection of 294th Street West and Avenue B, south of the Oso Canyon Drainage Corridor and north of proposed groundwater recharge basins (**Figure 3: *Recharge, Recovery Facilities and New Treatment Plant Location***). The location of the treatment facility does not alter the Habitat Management Land environmental commitment made in the original HDWB CEQA documents (**Figure 4: *Habitat Management Lands***).

2.2 TREATMENT FACILITY DESCRIPTION

The Treatment Facility would be utilized during recovery operations, typically during dry years when demands exceed supplies, to meet arsenic concentrations allowable to be pumped in to the SWP in accordance with DWR's policies and the Pump-In Agreement approved by the SWP Facilitation Group. The treatment process/facility is expected to remove approximately 75 percent of the naturally occurring arsenic concentrations found in the recovered water. This would lower arsenic concentrations of the overall recovery water to an acceptable level for pump-in to the SWP East Branch. It is anticipated that recharge of SWP water into the groundwater basin may have a dilution effect such that recovered water quality improves over time with respect to arsenic concentrations. Should this occur, treatment operations may be further optimized, to allow for a blending strategy whereby treated recovered groundwater may be blended with untreated recovered groundwater to meet the required water quality prior to pump-in to the SWP. An approved Pump-In Agreement with DWR would outline the testing and modeling requirements to ensure the pump-in program impacts to downstream SWP water quality are acceptable to DWR.

The Treatment Facility would generally consist of a manually operated system of approximately 12 acres of concrete lined basins and various tanks of chemicals for treatment and have a capacity of approximately 126 cubic feet per second (CFS). The Treatment Facility would be situated on 55 acres that would be raised approximately 5 feet higher than the existing ground surface and contain rip rap edges for flood protection. The construction of the treatment area site would be accomplished by using existing on-site soils mined from adjacent areas being constructed for recharge basins. No additional soils imported from offsite are anticipated to be used for the construction of the Treatment Facility pad. Minor additional piping will be installed to move water into the treatment plant, support the treatment plant process, and

return treated water to the main recovery infrastructure. This 55-acre area would also be fenced for security purposes and maintain a physical barrier to keep wildlife from entering the treatment area. Components of the Treatment Facility include:

- Chemical Storage: Chemicals used for the Treatment Facility would be stored in 3,000-12,000-gallon tanks located within a concrete area that would serve as secondary containment. It is estimated that a maximum of approximately 8,500 gallons of 9 percent to 12.5 percent Sodium Hypochlorite solution, 11,800 gallons of 40 percent Ferric Chloride solution, and 2,900 gallons of Polymer would be stored at the Treatment Facility. The chemicals would be stored on site only when recovery operations are occurring.

- Headworks: As water enters the Treatment Facility through the headworks piping, it is injected with sodium hypochlorite, which oxidizes arsenic to arsenate. Next, ferric chloride would be added to promote the formation of floc particles. Chemical injection into the headworks is accomplished using injection quills directly into the headworks piping system.

- Flocculation and Sedimentation Basins: Two to three concrete-lined basins, approximately 800 feet long by 200 feet wide by 14 feet deep with vertical sidewalls. The first approximately 120 feet would serve as the flocculation basins with baffles to promote clumping of particles that can later be removed as “floc” or “flakes.” The remaining approximately 680 feet would serve as the sedimentation basins which allow the floc to settle to the bottom of the basin for later removal.

- Pumping facilities: Water would enter the upstream inlet side of the treatment facility from existing recovery well pump pressure and flow by gravity until the finished water exits the sedimentation basin and is ready to return to the main pipelines for pump-in to the SWP. A low-lift pump station will be required to pump finished water back into the main pipeline for return to the SWP. This low-lift pump station is anticipated to consist of electric motor driven vertical turbine or axial flow pumps to be developed as part of the final design.

- Drying Beds: The sedimentation basins are anticipated to serve dual-purpose as drying beds. The facilities will be sized such that one sedimentation basin can be taken offline to allow the settled floc particles to dry and be hauled offsite. Prior to disposal, dried materials would be analyzed to determine if it is considered a hazardous or classified waste that would require special handling or disposal at a hazardous waste landfill. It is estimated that the drying beds would generate approximately one ton of dried material on an annual basis during periods of groundwater recovery. This will vary depending on the amount of water treated.

- Safety Measures: Safety measures, including a portable eyewash station(s), handrails, and fall prevention measures will be incorporated into the final design as required.

2.3 TREATMENT FACILITIES CONSTRUCTION

Construction of the Treatment Facility would occur concurrent with the overall project construction continuing through early-2026 and is anticipated to take approximately 9 months. Soil excavated from the water recharge basins would be moved to the pad area to achieve the desired elevation. It is estimated that approximately 67,000 cubic yards would be required to elevate the pad to above flood level.

Concrete required for the construction of the proposed treatment facility is assumed to be transported to the site via trucks. The assumed travel distance is approximately 30 miles and each truckload would contain approximately 10 cubic yards of concrete. The estimated total of concrete for the proposed treatment facility is 6,700 cubic yards and would require approximately 4.5 months for installation.

Alternatively, the Agency's contractor may elect to set up a small, portable concrete batch plant on site that could serve the Project's needs.

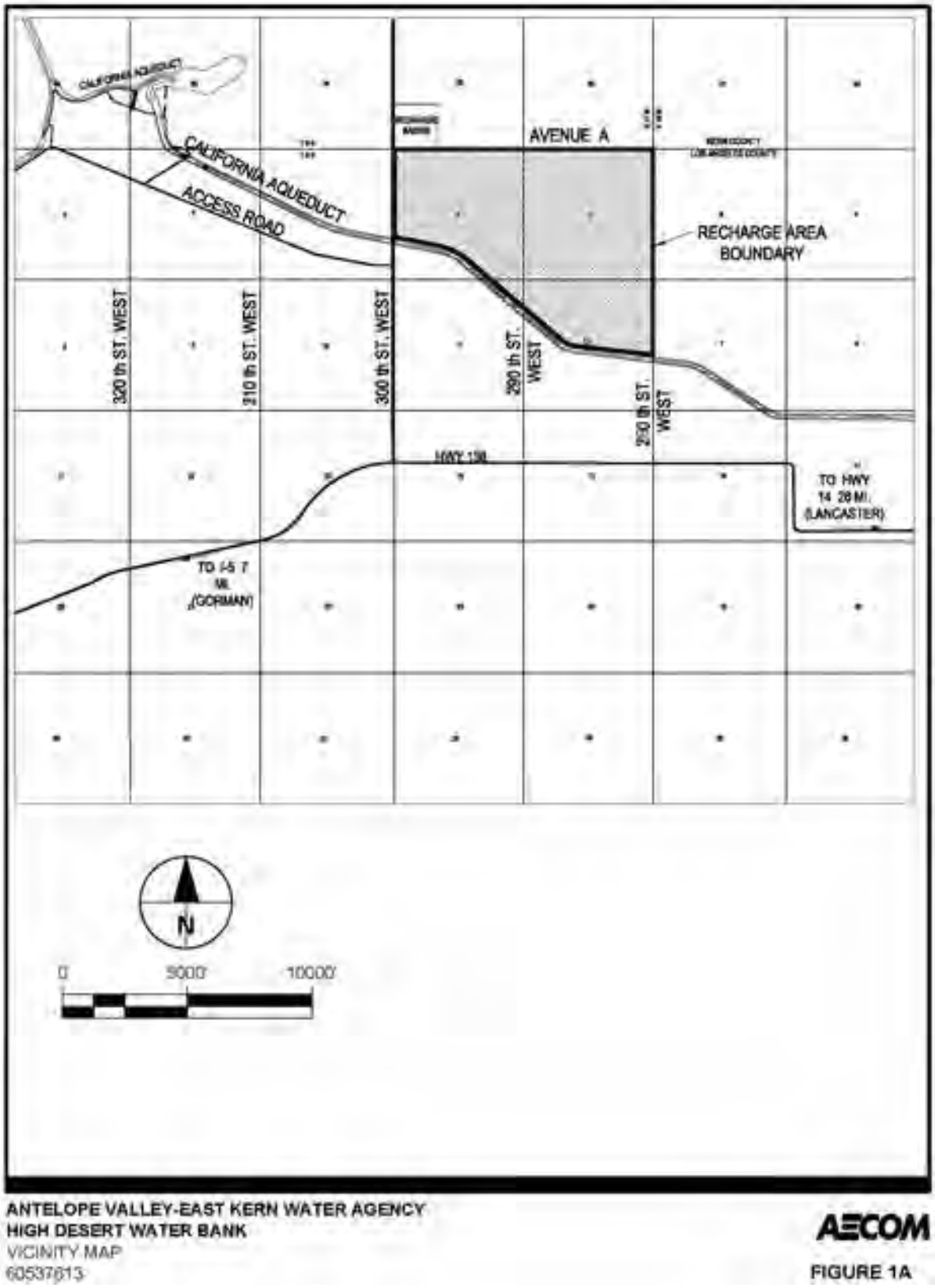
2.4 TREATMENT FACILITIES OPERATIONS

The Agency would develop an Operations and Maintenance Manual (O&MM) for the facility once it is designed and constructed. The O&MM would be prepared by a certified industrial hygienist or similar professional, in conjunction with the engineering team, to ensure compliance with all federal, state and local regulations regarding safe operations. The topics to be addressed in the O&MM would include but not be limited to safe operations, testing procedures, personnel training procedures, chemical handling, sludge management, and sedimentation basin maintenance procedures. Material Safety Data Sheets (MSDSs) for the chemicals used would be provided to employees as required by the California Occupational Safety and Health Administration (CAL/OHSA).

The treatment process for the removal of arsenic starts in the Headworks with the introduction of sodium hypochlorite to oxidize arsenic to arsenate followed by the addition of ferric chloride to develop the flocculation of the solids within the water column. Upon the development of floc, the remaining treatment consists of settlement of the floc to the bottom of the settling basin for collection and disposal after accumulation.

Each settling basin is anticipated to operate on a continuous basis for approximately 6 months, accumulating solids during that period of time. When approximately 1.5 to 3 feet of solids have accumulated in the settling basin, the influent flows would be diverted to the next settling basin to continue the treatment operations. Solids accumulated in the first basin would then be dewatered and allowed to dry within the basin. Once dry, solids would be removed and transported to an acceptable disposal site, including one accepting potentially hazardous waste materials dependent on testing results of the accumulated solids. If additional drying time is required, the solids would be relocated to the proposed drying beds, prior to transportation offsite. Any liquids removed during the dewater and drying process would be returned to the headworks of the treatment system and treated along with additional groundwater recovery flows.

Based on the current anticipated schedule, the Treatment Facility would likely operate for 1-2 years out of every five years, depending on the California's hydrological conditions. Cleaning of the settling basins and drying beds is anticipated to be accomplished by rubber wheeled loaders removing accumulated solids. The frequency of cleaning the solids from the basins is anticipated as annually, or as identified in the Agency's O&MM preparation.



ANTELOPE VALLEY-EAST KERN WATER AGENCY
HIGH DESERT WATER BANK
VICINITY MAP
60537613

AECOM
FIGURE 1A

Figure 1: HDWB Regional Location
Initial Study Addendum No. 2
High Desert Water Bank

ANTELOPE VALLEY-EAST KERN WATER AGENCY
HIGH DESERT WATER BANK
AERIAL VICINITY MAP
60537613

AECOM

FIGURE 1B

Figure 2: HDWB Location - Aerial
Initial Study Addendum No. 2
High Desert Water Bank

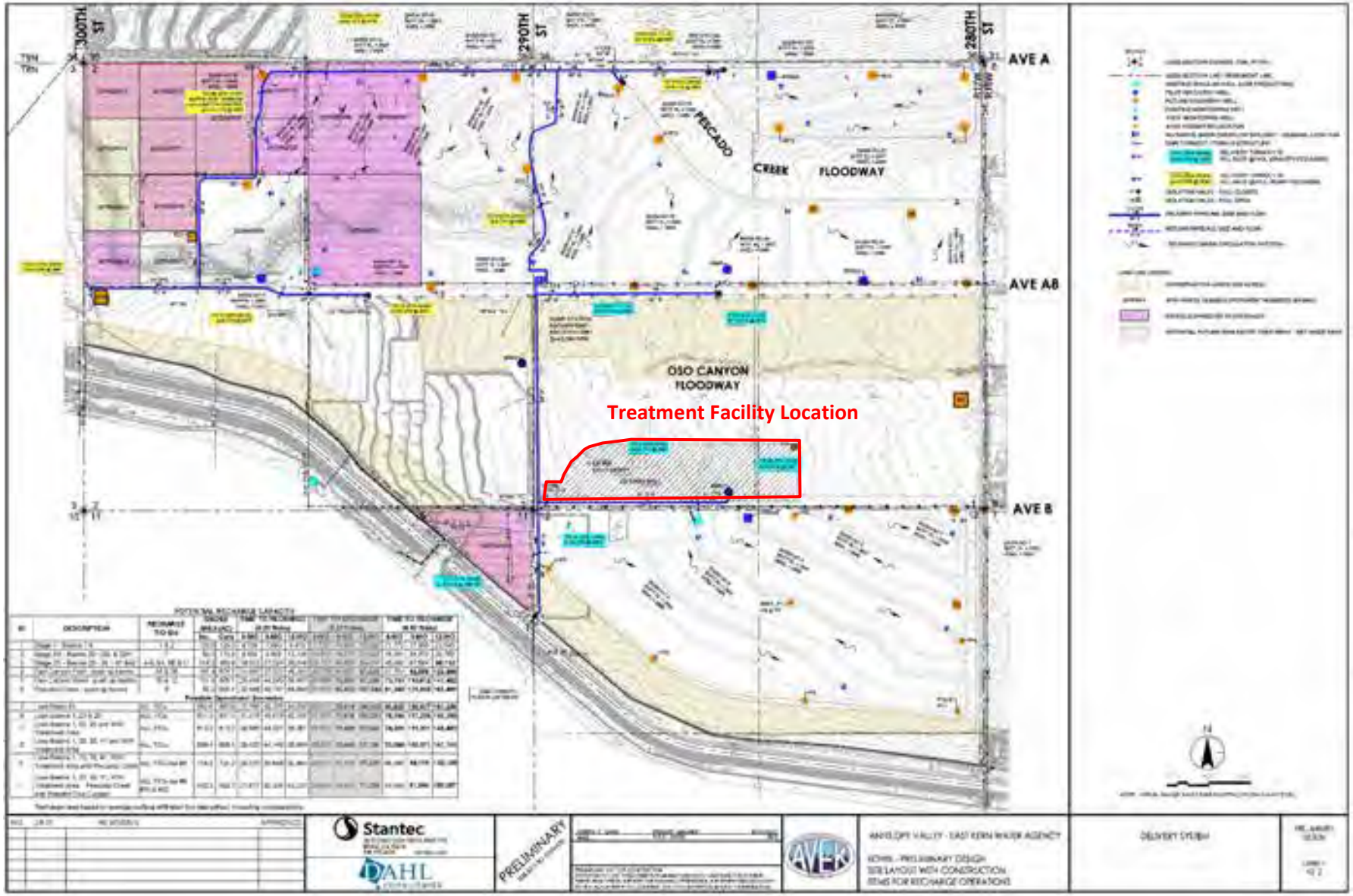


Figure 3: Recharge, Recovery Facilities and New Treatment Plant Location

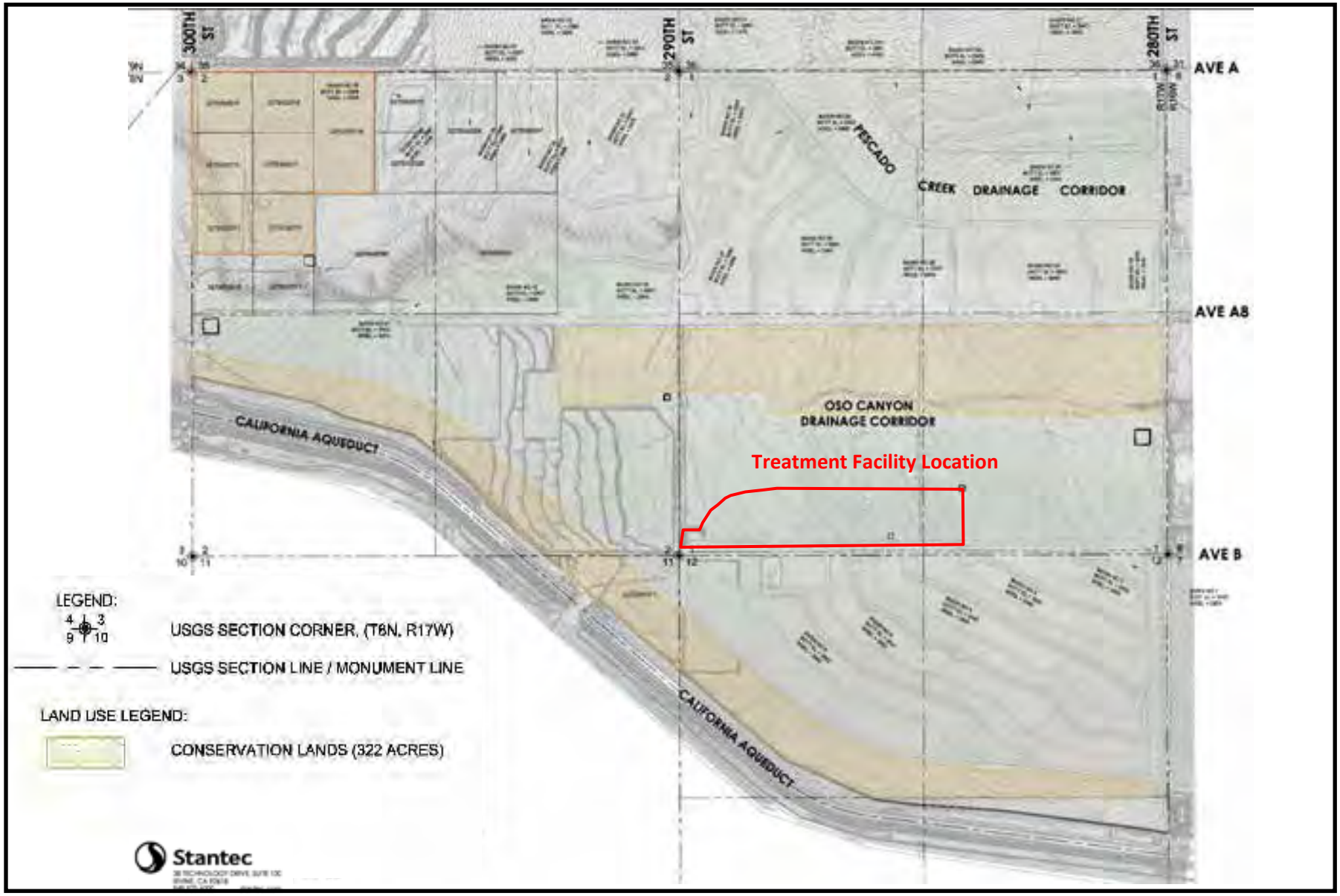


Figure 4: Habitat Management Lands – 2021 Revised Design

3 ENVIRONMENTAL REVIEW PROCESS

3.1 SUMMARY OF PROJECT CHANGES

The subject of this Addendum No. 2 to the HDWB Project Initial Study is the addition of a Treatment Facility (Proposed Project). Based on the concept design, construction and operations of the Proposed Project, the key considerations for environmental review include:

- Approximately 55 acres of an area formerly dedicated to push up berms would be dedicated for the Treatment Facility.
- The Treatment Facility would store various chemicals to use in the treatment process.
- The Treatment process would utilize heavy equipment to clean out the basins on a frequency of approximately annually.
- Approximately 5,000 cubic yards of residual material would be generated annually in the drying beds and may require disposal at a hazardous waste landfill.
- The Treatment Facility would be utilized to reduce naturally occurring arsenic in recovered water to a level acceptable to DWR for pump back to the SWP East Branch. When determining acceptable levels DWR will consider the in-situ blending effect of pumped-in water with SWP water.

3.2 REGULATORY FRAMEWORK

In December 2017 the Agency adopted a Mitigated Negative Declaration (2017 MND, SCH Number 2017061030) for the High Desert Water Bank Project (Project). The Agency's board approved an Addendum 1 on October 26, 2021, and filed a Notice of Determination for Addendum 1 on December 13, 2021 (SCH Number 2017061030). Due to the need to add a Treatment Facility, the Agency is required to reassess potential impacts and determine if the Project revisions require an Amendment or an Addendum to the 2017 MND.

3.2.1 Initial Study/MND Amendment

CEQA Guidelines Section 15162 states that when a negative declaration has been adopted for a project, no subsequent negative declaration shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in the light of the whole record, one or more of the following:

> *(1) Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;*
>
> *(2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or Negative Declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or*

(3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the Negative Declaration was adopted, shows any of the following:

(A) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;

(B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;

(C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

(D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

The guidelines further state that if changes to a project or its circumstances occur or new information becomes available after adoption of a negative declaration, the lead agency shall prepare a subsequent negative declaration if required under subdivision (a). Otherwise, the lead agency shall determine whether to prepare a subsequent negative declaration, an addendum, or no further documentation.

3.2.2 Initial Study/MND Addendum

CEQA Guidelines Section 15164 sets out the conditions in which an adopted MND can be revised or amended:

(a) The lead agency or a responsible agency shall prepare an addendum to a previously certified EIR if some changes or additions are necessary but none of the conditions described in Section 15162 calling for preparation of a subsequent EIR have occurred.

(b) An addendum to an adopted negative declaration may be prepared if only minor technical changes or additions are necessary or none of the conditions described in Section 15162 calling for the preparation of a subsequent EIR or negative declaration have occurred.

(c) An addendum need not be circulated for public review but can be included in or attached to the final EIR or adopted negative declaration.

(d) The decision-making body shall consider the addendum with the final EIR or adopted negative declaration prior to making a decision on the project.

(e) A brief explanation of the decision not to prepare a subsequent EIR pursuant to Section 15162 should be included in an addendum to an EIR, the lead agency's required findings on the project, or elsewhere in the record. The explanation must be supported by substantial evidence.

3.3 INITIAL STUDY CHECKLIST

This Initial Study Addendum No. 2 is based on an Environmental Checklist Form (Form), as suggested in Section 15063(d)(3) of the State CEQA Guidelines, as amended, and includes a series of questions about

the Project for each of the listed environmental topics. The format of the Form has been revised to evaluate the categories in terms of any changed condition (e.g., changed circumstances, project changes, or new information of substantial importance) that may result in a changed environmental result (e.g., a new significant impact or substantial increase in the severity of a previously identified significant effect) (CEQA Guidelines § 15162[a]).

Pursuant to Public Resources Code Section 21166, and CEQA Guidelines Sections 15162 and 15164, subd. (a), Addendum No. 1 utilized the most current CEQA Checklist Form to evaluate the 2021 Revised Project Design. This Addendum No. 2 utilizes the Addendum No. 1 checklist Form to evaluate the proposed Treatment Facility as there have been no major revisions to the Form since the time of the preparation of the 2021 Amendment No. 1.

Based on the Treatment Facility design and operations identified in Section 2 of this document, implementation of the Treatment Facility would require additional environmental evaluation in the only in following categories:

- Air Quality
- Biological Resources
- Hazards and Hazardous Materials
- Hydrology and Water Quality

Refer to **Table 1: *CEQA Evaluation Topics Not Applicable to Addendum No. 2*** for the rationale for the elimination of evaluation of various topics.

Table 1: CEQA Evaluation Topics Not Applicable to Addendum No. 2

2017 CEQA Initial Study Document Section	2021 Initial Study Addendum No. 1 Document Section	CEQA	Topic	Rationale
2.2	Not Addressed/Not Applicable	I	Aesthetics	Not applicable – no scenic highways in the area and the Treatment Facility tanks would be typically 8 to 9 feet high and situated in the middle of a 1,500 acre site, the tanks would not be visible from any roadway or neighborhood. No further discussion is warranted.
2.3	4.1	II	Agriculture and Forestry	The Treatment Facility would not be located in an area of Prime or other designated Farmland within the HDWB lands. No further discussion is warranted.
2.6	4.4	V	Cultural Resources	A cultural resource program of monitoring that is applicable to the HDWB would also apply to the area of the proposed Treatment Facility. No further discussion is warranted.
Not Addressed	4.5	VI	Energy	Not applicable – The Project is a public-benefit project and would not be inconsistent with law or policies regarding energy regulation. The Treatment Facility, which would use electricity, would only be operable during times of recovery where water is needed to be treated prior to discharge into the SWP aqueduct, which would not represent a wasteful, inefficient use or unnecessary consumption of electricity. No further discussion is warranted.
2.7	4.6	VII	Geology and Soils	Not applicable. The Treatment Facility construction and operation would be required to comply existing Mitigation Measures GEO-1, GEO-2, GEO-3 and GEO-4 which requires preparation of a SWPPP to manage soil erosion during construction and operation, using seismic design, installing shut-off valves for major pipelines, and establishment of a groundwater monitoring plan. No additional mitigation would be required. No further discussion is warranted.
2.8	4.7	VIII	Greenhouse Gas Emissions	Not applicable. The HDWB activities were found to represent approximately 0.08 percent of the Antelope Valley Air Quality Management District (AVAQMD) thresholds. The Treatment Facility construction would not increase greenhouse gas emissions because the overall Project emissions were extremely low and the addition of a 55-acre Treatment Facility would represent a nominal increase in emissions, but that would still be well under the AVAQMD thresholds. No further discussion is warranted.
2.11	Not Addressed/Not Applicable	XI	Land Use and Planning	Not applicable. The Treatment Facility location is within the existing HDWB property that has been previously analyzed. No further discussion is warranted.
2.12	Not Addressed/Not Applicable	XII	Mineral Resources	Not applicable. The Treatment Facility location is within the existing HDWB property that has been previously analyzed. No further discussion is warranted.

2017 CEQA Initial Study Document Section	2021 Initial Study Addendum No. 1 Document Section	CEQA	Topic	Rationale
2.13	4.10	XIII	Noise	Not applicable. The Treatment Facility is within the existing HDWB property, and noise measures for the Project would also apply to the Treatment Facility. No further discussion is warranted.
2.14	Not Addressed/Not Applicable	XIV	Population and Housing	Not applicable. The Treatment Facility location is within the existing HDWB property that has been previously analyzed. No further discussion is warranted.
2.15	Not Addressed/Not Applicable	XV	Public Services	Not applicable. The Treatment Facility location is within the existing HDWB property that has been previously analyzed. No further discussion is warranted.
2.16	Not Addressed/Not Applicable	XVI	Recreation	Not applicable. The Treatment Facility location is within the existing HDWB property that has been previously analyzed. No further discussion is warranted.
2.17	4.11	XVII	Transportation/Traffic	Not applicable. The Treatment Facility would not generate a permanent impact on traffic/transportation. Construction traffic for the Treatment Facility would be consistent with that which was analyzed in the 2017 Original Project Design and is considered a temporary impact. No further discussion is warranted.
2.18	4.12	XVIII	Tribal Cultural Resources	Not applicable. The Treatment Facility construction would be required to comply with existing Mitigation Measures TCR-1 and TCR-2 to accommodate unanticipated resources. No further mitigation would be required. No further discussion is warranted.
2.19	4.13	XIX	Utilities and Service Systems	Not applicable. The Treatment Facility construction would be required to comply with existing Mitigation Measure UTIL-1 that requires working with the electric utility on power needs for the overall HDWB project. No further mitigation would be required. No further discussion is warranted.
Not Addressed	4.14	XX	Wildfire	Not applicable. The Treatment Facility location is within the existing HDWB property that has been previously analyzed. No further discussion is warranted.

3.4 MITIGATION MONITORING AND REPORTING PROGRAM

The 2017 MND included a Mitigation Monitoring and Reporting Program (MMRP) that identified mitigation measures, timing and compliance requirements that would reduce impacts to less than significant. The MMRP adopted is included in **Appendix A – *Mitigation Monitoring and Reporting Program***. The Mitigation Measures are summarized in **Table 1: *Mitigation Measure Summary*.**

Addendum No. 1 of the Initial Study identified that there were no additional mitigation measures required but did provide modification and/or clarifications of several measures identified in the 2017 MND. Therefore, in accordance with CEQA Guidelines Section 15162 (3)(C) and (D), Addendum No. 1 identified that all mitigation measures from the 2017 Initial Study were found feasible, and no mitigation measures or alternatives were considerably different from those analyzed in the 2017 Initial Study/MND.

Table 2: Mitigation Measure Summary

Topic Area	MM Number	Summary Description
General	Pre Construction Training	Determine the need for a pre-construction training program
Ag Resources	AG-1	Prime Farmland Avoidance.
Air Resources	AQ-1	Minimization Measure for NOx Related Emissions
Biological Resources	BIO-1	Burrowing Owls (Pre-Construction Surveys)
Biological Resources	BIO-2	Desert Kit Fox and American Badger (Pre-Construction Surveys)
Biological Resources	BIO-3	Nesting Birds (Pre-Construction Surveys)
Biological Resources	BIO-4	Animal Movement and Entrapment (Trenches)
Biological Resources	BIO-5	Animal Movement and Entrapment (Pipes)
Biological Resources	BIO-6	Erosion and Sediment Control
Biological Resources	BIO-7	Special-Status Plants
Biological Resources	BIO-8	Swainson's Hawk (focused surveys prior to recharge basin construction)
Biological Resources	BIO-9	Tri-colored Blackbirds (focused surveys prior to recharge basin construction)
Biological Resources	BIO-10	Jurisdictional Drainages and Wetlands and Permitting (prior to recharge basin construction)
Biological Resources	BIO-11	Habitat Mitigation (prepare Habitat Mitigation Management Program)
Biological Resources	BIO-12	General (construction crew training, site and staging guidelines)
Cultural Resources	CR-1	Cultural Resources Monitoring (develop a Cultural Resources Monitoring and Mitigation Plan prior to start of ground disturbance)
Cultural Resources	CR-2	Regulation Compliance (accidental discovery of human remains)
Geology and Soils	GEO-1	Stormwater Pollution Prevention Plan (SWPPP)
Geology and Soils	GEO-2	Seismic Design
Geology and Soils	GEO-3	Pipeline Shut Off Valves
Geology and Soils	GEO-4	Groundwater Monitoring Plan
Hazards and Haz Materials	HAZ-1	Spill Prevention Plan
Hazards and Haz Materials	HAZ-2	Bird Strike Hazard Notification

Topic Area	MM Number	Summary Description
Hazards and Haz Materials	HAZ-3	Bird Strike Hazard Minimization Measures
Hazards and Haz Materials	HAZ-4	Mosquito Borne Disease Minimization Measures
Hydrology and Water Quality	HWQ-1	Drainage Design (Construct recharge areas so that they will not divert sheet flooding and other runoff away from the recharge areas)
Hydrology and Water Quality	HWQ-2	Stormwater Pollution Prevention Plan (SWPPP)
Hydrology and Water Quality	HWQ-3	Spill Prevention Plan
Hydrology and Water Quality	HWQ-4	Protection of Off Site Wells
Hydrology and Water Quality	HWQ-5	Management of Herbicides and Pesticides
Noise	NOISE-1	Construction Noise Monitoring and Minimization Measures (near and along 280th Street West)
Noise	NOISE-2	Operation Noise Minimization Measures (near and along 280th Street West)
Tribal Cultural Resources	TCR-1	Inadvertent Finds
Utilities	UTIL-1	Electrical Service Upgrade Minimization Measures (expansion of grid for Project)

3.5 DETERMINATION SUMMARY

This High Desert Water Bank Initial Study Amendment No. 2 and attached documents constitute substantial evidence supporting the conclusion that preparation of a supplemental or subsequent EIR is not required prior to approval because the conditions described in CEQA Guidelines Section 15162 are not met. There are no substantial changes in Project design or in the circumstances in which the Treatment Facility would be undertaken that require major revisions of the 2017 Initial Study/Mitigated Negative Declaration or be inconsistent with the 2021 Addendum No. 1. As illustrated herein, the proposed Treatment Facility is consistent with the previous 2017 Initial Study/Mitigated Negative Declaration and Addendum No. 1 and would involve only minor changes; therefore, an Initial Study Addendum No. 2 is appropriate CEQA compliance for the Proposed Project and can be prepared pursuant to CEQA Guidelines Section 15164

3.6 FINDING

Based on an examination of the analysis, findings, and conclusions of the 2017 Initial Study/MND and 2021 Addendum No. 1, the potential impacts of the Proposed Project Change of implementation of a Treatment Facility remains within the impacts previously analyzed and disclosed in the 2017 Initial Study/MND and 2021 Addendum No. 1, and none of the conditions in CEQA Guidelines Section 15162 exist (CEQA Guidelines § 15164). Therefore, an addendum to the 2017 MND is the appropriate environmental document to approve and implement the Treatment Facility, and no further analysis is required under CEQA before undertaking the Proposed Project Change.

Therefore, I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature	Date
Name	Title

4 ENVIRONMENTAL ANALYSIS

The purpose of the checklist is to evaluate the categories in terms of any changed condition (e.g., changed circumstances, project changes, or new information of substantial importance) that may result in a changed environmental result (e.g., a new significant impact or substantial increase in the severity of a previously identified significant effect) (CEQA Guidelines § 15162).

The questions posed in the checklist come from Appendix G of the CEQA Guidelines and the 2017 MND. A "no" answer does not necessarily mean that there are no potential impacts relative to the environmental category, but that there is no change in the condition or status of the impact since it was analyzed and addressed with mitigation measures in the 2017 MND.

EXPLANATION OF CHECKLIST EVALUATION CATEGORIES

Environmental Subject Area

The checklist utilized is from Appendix G of the 2021 CEQA Guidelines. Only those categories that are applicable to implementation of the Proposed Treatment Facility (Proposed Project) are identified.

Conclusion in 2017 MND and Related Documents

This column identifies the conclusion of the 2017 Initial Study relative to the Environmental Subject Area listed under each topic as identified in the 2017 Initial Study.

Do the Proposed Changes Involve New Impacts?

Pursuant to CEQA Guidelines Section 15162, subd. (a)(1), this column indicates whether the Proposed Treatment Facility would result in new significant environmental impacts not previously identified or mitigated by the 2017 Initial Study and 2021 Addendum No. 1 or whether the Proposed Treatment Facility would result in a substantial increase in the severity of a previously identified significant impact.

New Circumstances Involving New Impacts?

Pursuant to CEQA Guidelines Section 15162, subd. (a)(2), this column indicates whether the Proposed Treatment Facility would result in substantial changes with respect to the circumstances under which the project is undertaken that will require major revisions to the 2017 Initial Study and 2021 Addendum No. 1 due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.

New Information Requiring New Analysis or Verification?

Pursuant to CEQA Guidelines Section 15162, subd. (a)(3)(A-D), this column indicates whether new information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the 2017 MND was adopted, shows any of the following:

(A) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;

(B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;

(C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

(D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

If the additional analysis completed as part of this environmental review were to find that the conclusions of the 2017 Initial Study and 2021 Addendum No. 1 remain the same and no new significant impacts are identified, or identified impacts are not found to be substantially more severe, or additional mitigation is not necessary, then the question would be answered "no," and no additional environmental document would be required.

Mitigation Measures Implemented or Address Impacts

Pursuant to CEQA Guidelines Section 15162, subd. (a)(3), this column indicates whether the 2017 Initial Study and 2021 Addendum No. 1 provides mitigation measures to address effects in the related impact category. Any previously adopted mitigation measures will be identified. The response will also address proposed revisions to previously adopted mitigation measures. These mitigation measures will be implemented with the construction of the project, as applicable. If "NA" is indicated, the 2017 MND and 2021 Addendum No. 1 have concluded that the impact either does not occur with this project or is not significant, and therefore no additional mitigation measures are needed.

Discussion

The Discussion section provides a narrative of the assumptions and conclusions identified for the Original Project Design, the 2017 Initial Study and the 2021 Addendum No. 1, and analyzes how those conclusions compare to the implementation of the Proposed Treatment Facility.

Mitigation Measures

Applicable mitigation measures from the 2017 MND identified in each environmental category where the 2017 MND identified mitigation. Any revisions or new measures are also identified in this section.

Conclusions

A discussion of the conclusion relating to the analysis is contained in each section.

4.1 AIR QUALITY

Environmental Subject Area	Conclusion in 2017 MND And 2021 Addendum No. 1	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:					
a) Conflict with or obstruct implementation of the applicable air quality plan?	Less Than Significant	No	No	No	None
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	Less Than Significant With Mitigation Incorporated	No	No	No	AQ-1
c) Expose sensitive receptors to substantial pollutant concentrations?	Less Than Significant	No	No	No	None
d) Result in other emissions (such as those leading to odors adversely affecting a substantial number of people?	Less Than Significant	No	No	No	None

4.1.1 Discussion

Summary of 2017 MND

Project impacts were determined to be less than significant, except for potentially NOx emissions during construction of overlapping activities. As such, Mitigation Measure AQ-1 which requires Tier 4 equipment be used for site construction was developed to reduce impacts to less than significant.

Summary of 2021 Addendum No. 1

The emissions for the 2021 Revised Project were calculated using the 2017 MND Mitigation Measure AQ-1, which requires the use of off-road construction diesel engines that meet Tier 4 interim California Emission Standards. The 2021 Addendum No. 1 assessed overlapping activities of the 2017 Original Project Design and 2021 Revised Design in the 2021 Addendum No. 1 as Table 4.2-1: *Air Quality Emissions Project Comparison*, as follows:

Table 4.2 1: Air Quality Emissions Project Comparison

Activity	Pollutant Emissions (lbs/day)				
	VOC	NOx	CO	PM10	PM2.5
Activity 3: Transmission Facility / Underground Pipeline					
2017 Original Project Design[2]	1.36	21.76	39.21	10.05	2.98
2021 Revised Project Design - Unmitigated	4.47	38.71	44.65	4.19	2.21
2021 Revised Project Design - Mitigated	1.84	26.26	56.09	2.65	0.08
Mitigated Emission Change	0.48	4.50	16.88	-7.40	-2.90
Activity 4: Recharge Facility / Recharge Basin, Grading, Above-ground Pipeline Install					
2017 Original Project Design[2]	0.61	4.43	12.02	3.01	1.73
2021 Revised Project Design - Unmitigated	6.89	66.94	59.23	6.38	3.31
2021 Revised Project Design - Mitigated	2.29	32.24	70.63	3.73	0.89
Mitigated Emission Change	1.68	27.81	58.61	0.72	-0.84
Activity 5: Recovery Facilities / Extraction Wells / Recovery					
2017 Original Project Design[2]	2.79	45.12	77.05	38.47	5.67
2021 Revised Project Design - Unmitigated	9.71	88.81	74.32	6.45	3.78
2021 Revised Project Design - Mitigated	5.10	73.69	150.70	3.92	1.42
Mitigated Emission Change	2.31	28.57	73.65	-34.55	-4.25
Subtotal of Activities 1,2,5 (overlap Year 1, months 1-3)					
2017 Original Project Design[2]	5.79	88.06	146.07	57.3	10.56
2021 Revised Project Design - Unmitigated	12.71	131.75	143.34	25.28	8.67
2021 Revised Project Design - Mitigated	8.10	116.63	219.72	22.75	6.31
Subtotal of Activities 3,5 (overlap Year 1, months 11,12)					
2017 Original Project Design[2]	4.15	66.88	116.26	48.52	8.65
2021 Revised Project Design - Unmitigated	14.18	127.52	118.97	10.64	5.99
2021 Revised Project Design - Mitigated	6.94	99.95	206.79	6.58	1.50
Subtotal of Activities 3,5,6 (overlap Year 2, months 1-5)					
2017 Original Project Design[2]	30.99	97.09	153.59	70.08	13.11
2021 Revised Project Design - Unmitigated	41.02	157.73	156.30	32.20	10.45
2021 Revised Project Design - Mitigated	33.78	130.16	244.12	28.14	5.96
Subtotal of Activities 4.5,6 (overlap Year 2, month 6)					
2017 Original Project Design[2]	30.24	79.76	126.4	63.05	11.86
2021 Revised Project Design - Unmitigated	43.44	185.96	170.89	34.39	11.54
2021 Revised Project Design - Mitigated	34.23	136.14	258.65	29.23	6.77
2017 Maximum Daily Construction Emissions[2]	30.99	97.09	153.59	70.08	13.11
2021 Unmitigated Maximum Daily Construction Emissions	43.44	185.96	170.89	34.39	11.54
2021 Mitigated Maximum Daily Construction Emissions	**34.23**	**136.14**	**258.65**	**29.23**	**6.77**
Change in Maximum Daily Construction Emissions - Unmitigated	12.45	88.87	17.30	-35.69	-1.57
Change in Maximum Daily Construction Emissions - Mitigated	3.24	39.05	105.06	-40.85	-6.34
AVAQMD Thresholds	**137**	**137**	**548**	**82**	**65**
Exceeds Thresholds	No	**No**	No	No	No

Notes:
[1] Source: CalEEMod Version 2020.4.0
[2] Source: 2017 AECOM – Air Quality Technical Memorandum

The analysis identified that implementation of Mitigation Measure AQ-1 was sufficient to maintain a less than significant impact.

Proposed Project Change – Treatment Facility Implementation

The Treatment Facility would be constructed in conjunction with other HDWB components, and as such, also be subject to Mitigation Measure AQ-1. Though the Air Quality Impacts of the Treatment Facility were not modeled in either the 2017 Initial Study/MND or the 2021 Addendum No. 1, it is assumed that construction of some of the overlapping activities, such as the underground piping and basin construction, would not occur at the same time as the construction of the Treatment Facility. Additionally, construction of the pump station described in Addendum 1 has been delayed such that the construction will not occur concurrently with other components of the project, including the Treatment Facility. Therefore, the construction emissions associated with the construction of the Treatment Facility would be consistent with the emissions as analyzed in the 2021 Addendum No. 1 and would not exceed the AVAQMD standards.

Soil excavated from the basins that are planned throughout the facility would be redirected from other parts of the facility to create the 55-acre pad for the treatment facility. Therefore, the implementation of the Treatment Facility would not require import or export of soil to the HDWB that would increase emissions in the region or at the HDWB site.

Sediment generated by the treatment process will be left in the basins until dry, the timing of which is not known at this time. The drying sediment is not anticipated to generate substantial odors regularly but may emit a mild odor during warmer months. There are two rural residential developments near the HDWB. One development is located approximately 1.5 miles south of the Treatment Facility and the second one consisting of the community of Neenach is located about 2 miles east of the HDWB's eastern boundary. The Treatment Facility would be located approximately in the middle of the HDWB's 1,500-acre facility. Therefore, it is not anticipated that the mild odor that might be generated from the drying beds would reach any residential area. Additionally, the Treatment Facility is anticipated to be operational only during recovery, which is estimated to be 1-2 years out of every five years depending on California's hydrological conditions. Therefore, the impacts of potential odor would be less than significant.

4.1.2 Mitigation Measures

The 2017 MND identified the following mitigation measure to reduce impacts to less than significant:

AQ-1 **Minimization Measure for NOx Related Emissions -** Construction contractor shall use off road construction diesel engines that meet, at a minimum, the Tier 4 interim California Emissions Standards, unless such an engine is not available for a particular item of equipment. Tier 3 engines will be allowed on a case-by-case basis when the contractor has documented that no Tier 4 interim equipment, or emissions equivalent retrofit equipment is available for a particular equipment type that must be used to complete construction. Documentation shall consist of signed written statements from at least two construction equipment rental firms.

Revisions to Mitigation Measures:

The Proposed Project Change of the implementation of a Treatment Facility would be required to comply with Mitigation Measure AQ-1, and the Agency agrees that this is a feasible mitigation. The Proposed Project Change does not require a modification of the existing mitigation measure nor does require any new measures to reduce impacts to Air Quality to less than significant.

4.1.3 Conclusion

The Proposed Project Change does not change the type or extent of development analyzed in the 2017 Initial Study or the 2021 Addendum No. 1. Applicable mitigation measures previously identified in the 2017 MND and 2021 Addendum No. 1 will be required as set forth in the MMRP, and no considerably different mitigation measures that may substantially reduce impacts have been identified or rejected. The Proposed Project Change of implementing the Treatment Facility would not involve new significant or more severe impacts to Air Quality than those previously identified and analyzed in the 2017 Initial Study or 2021 Addendum No. 1. Therefore, none of the conditions described in CEQA Guidelines Section 15162 calling for preparation of a subsequent EIR have occurred with respect to Air Quality resources.

4.2 BIOLOGICAL RESOURCES

Environmental Subject Area	Conclusion in 2017 MND And 2021 Addendum No. 1	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
IV. BIOLOGICAL RESOURCES: Would the project:					
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	Less Than Significant With Mitigation Incorporated				BIO-1, through BIO-5, BIO-7 through BIO-9 BIO-11 BIO-12
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?	Less Than Significant				None
c) Have a substantial adverse effect on state or 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	Less Than Significant With Mitigation Incorporated				BIO-6, BIO-7 BIO-10, BIO-12
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	Less Than Significant				None
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	Less Than Significant				None

Environmental Subject Area	Conclusion in 2017 MND And 2021 Addendum No. 1	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
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?	Less Than Significant	No	No	No	None

4.2.1 Discussion

Summary of 2017 MND

Based on the results of the CNDDB search and the field surveys, the Project site is known to or expected to support sensitive biological resources and native habitats which will be disrupted or removed by the proposed Project. Potential impacts include destruction of nests and disruption of natural nesting behaviors in nesting birds, including raptors, and removal of potentially suitable habitats for sensitive and special-status wildlife species, including American badger, desert kit fox, burrowing owls, and others.

The 2017 Initial Study identified that the Agency would provide approximately 322 acres of undisturbed native and naturalized vegetation communities that would provide habitat for both common and special-status plant and wildlife species within the Project site. Similar habitats also are common within the Project vicinity. Thus, loss of habitat due to permanent impacts associated with the Project and temporary loss due to inundation of the recharge basins does not represent a substantial impact to any species.

Wildlife species may use the open spaces within the Project site for dispersal and transitory movement, and may be subject to potential injury or entrapment in open trenches and open-ended pipes. To prevent entrapment, injury, and mortality, mitigation measures are required to reduce impacts to less than significant.

Additional mitigation measures to protect habitat and species included general crew training, staging guidelines and preparation of a Habitat Mitigation Management Program (HMMP).

Criteria IV(c): State and Federal wetlands

The 2017 MND identified that there were no federally protected waters occur within the Project site. None of the potential wetland and waters features exhibit hydrologic connection to any Traditional Navigable Waters (TNWs). Thus, there will be no impacts to federally protected wetlands. Mitigation Measure BIO-10 requires a formal jurisdictional delineation for both State and Federal waters. Prior to the 2017 MND adoption, the Agency fulfilled the requirements of BIO-10 and conducted the jurisdictional waters assessment. The results of that assessment were also included in the final 2017 MND that was adopted.

The 2017 Jurisdictional Delineation identified that the Project site supported two intermittent streams and two potential wetland features, and the features are potential CDFW-jurisdictional streambeds,

subject to CDFW regulatory authority under section 1600 *et seq.* of the California Fish and Game Code. Refer to **Figure 5: *Potential Water Features Identified in Biological Studies*** for the location of the drainages from the 2017 Biological Resources Report that supported the 2017 MND.

However, should the Project implementation require impacts to waters of the State, the Agency would obtain all applicable regulatory permits prior to any fill or alteration of waters features, including submission of a Notification of Lake or Streambed Alteration application, in order to support the CDFW in determining the need for a Lake and Streambed Alteration Agreement (LSA).

Summary of 2021 Addendum No. 1

The 2017 Original Project Design identified that the original design would disturb 1,200 acres, with 400 acres of recharge basins in use at all times, rotating throughout the HDWB property. The revised 2021 Revised Project Design would permanently disturb 890 acres of fixed recharge basins, for a shorter time frame. With the revised design being fixed basins of approximately 890 acres, and recharge occurring over a shorter time frame, wildlife would have a fixed, consistent landscape in which to forage and nest as well as fixed areas for water sources. Therefore, the 2021 Revised Project Design was found to provide a benefit of stability to the on-site wildlife.

Further, the 2021 Revised Project Design also included an assessment of the re-location of the 322 acres designated for habitat management in the 2017 Initial Study/MND. The relocation essentially eliminated the original southern block of habitat and reduced the northern block but provided a wider corridor of preservation in the drainage located in the middle of the site, as well as a wider strip along the aqueduct to facilitate wildlife movement between the northern and southern portions of the site, as well as good habitat in the central drainage area. The larger blocks of habitat, along with the constructed basins, were found to provide higher quality local wildlife movement opportunities across the site, while providing potential watering holes.

The 2017 Original Design eliminated approximately 12 acres of habitat to support groundwater recovery and monitoring wells, above ground piping, and related infrastructure.

Proposed Project Change – Treatment Facility Implementation

<u>Habitat Availability:</u> The Proposed Project Change of implementing the Treatment Facility would not overlap with, and would therefore preserve, the 322 acres of habitat management lands (Figure 4) previously identified. The Treatment Facility would be fenced to prevent wildlife access, therefore, implementation of the Treatment Facility would remove approximately 55 acres of the 1,500 acres available for forage and nesting. The treatment area represents approximately 0.03 percent of the entire HDWB that would be not be available for wildlife forage or water. This is considered nominal compared to the other areas that are available on site.

Other fenced areas included the 28 extraction well areas of each approximately 100 feet wide by 100 feet wide, located throughout the site representing approximately 6.42 acres in total. Therefore, with the Treatment Facility, the HDWB would remove from wildlife service approximately 61 total acres of land available for wildlife, or approximately 0.04 percent of the entire HDWB site.

The Treatment Facility is proposed to be located in the area of the intersection of 294th Street and Avenue B, both of which are established non-public unpaved roadways. Basins are located immediately south of Avenue B, which are approximately 6 feet deep with a minimal bottom slope of one-half percent and sideslopes that would be hardened with rock to protect the basin berms from drainage flows conveying through the project site. Immediately north of the Treatment Facility, "push up" or sacrificial, gentle, berms. Both of these immediately adjacent areas would be suitable alternatives for wildlife forage and/or nesting.

Therefore, removal of an additional 0.03 percent of the HDWB site from wildlife habitat would be a less than significant impact because there is suitable habitat in the immediate vicinity of the Proposed Treatment Facility.

Avian Attraction to Treatment Basins: According to Section 2.9.3.4 of the 2017 Initial Study/MND, shorebirds are typically attracted to shallow ponds while ducks and migratory geese and birds typically prefer deeper ponds. The flocculation and sedimentation basins are anticipated to be approximately 800 feet wide by 200 feet long, and approximately 14 feet deep each with a total of three basins. Use of these basins by wildlife, including migratory birds such as ducks and geese poses no impact to water quality since the water is being discharged to a surface water source in the SWP which is regularly used by avian wildlife. Conversely, the water detained in the treatment basins pose no threat to avian wildlife since chemicals being used will be approved for use in drinking water treatment and consumed or diluted once introduced to the source water. The Treatment Facility is expected to be in operation over a 1-2 year period every five years, or during times of recovery. Once operational, the Agency would monitor for potential avian usage and take appropriate bird deterrent measures, if needed. The treatment basins will have vertical walls, which provide a deterrent to potential shorebirds.

Implementation of the Treatment Facility would have a less than significant impact on wildlife.

4.2.2 Mitigation Measures

The 2017 MND identified the following mitigation measure to reduce impacts to less than significant:

For brevity, these measures are summarized below, and the full text is included in Appendix A.

- BIO-1 Burrowing Owls (Pre-Construction Surveys)
- BIO-2 Desert Kit Fox and American Badger (Pre-Construction Surveys)
- BIO-3 Nesting Birds (Pre-Construction Surveys)
- BIO-4 Animal Movement and Entrapment (Trenches)
- BIO-5 Animal Movement and Entrapment (Pipes)
- BIO-6 Erosion and Sediment Control
- BIO-7 Special-Status Plant surveys
- BIO-8 Swainson's Hawk (focused surveys prior to recharge basin construction)
- BIO-9 Tri-colored Blackbirds (focused surveys prior to recharge basin construction)
- BIO-10 Jurisdictional Drainages and Wetlands and Permitting (prior to recharge basin construction)
- BIO-11 Habitat Mitigation (prepare Habitat Mitigation Management Program)
- BIO-12 General (construction crew training, site and staging guidelines)

Revisions to Mitigation Measures:

The Proposed Project Change of the implementation of a Treatment Facility would be required to comply with Mitigation Measures BIO-1 through BIO-12, as identified in the 2017 Initial Study/MND, and the Agency agrees that these are feasible mitigation measures that would apply to the Proposed Treatment Facility. The Proposed Project Change therefore does not require a modification of any existing measure nor does it require any new measures be developed to reduce impacts to Biological Resources to less than significant.

4.2.3 Conclusion

The Proposed Project Change does not change the type or extent of development analyzed in the 2017 Initial Study or the 2021 Addendum No. 1. Applicable mitigation measures previously identified in the 2017 MND and 2021 Addendum No. 1 will be required as set forth in the MMRP, and no considerably different mitigation measures that may substantially reduce impacts have been identified or rejected. The Proposed Project Change of implementing the Treatment Facility would not involve new significant or more severe impacts to Biological Resources than those previously identified and analyzed in the 2017 Initial Study or 2021 Addendum No. 1. Therefore, none of the conditions described in CEQA Guidelines Section 15162 calling for preparation of a subsequent EIR have occurred with respect to Biological resources.

Figure 5: Potential Natural Water Features
Initial Study Addendum No. 2
High Desert Water Bank

4.3 HAZARDS AND HAZARDOUS MATERIALS

Environmental Subject Area	Conclusion in 2017 MND And 2021 Addendum No. 1	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
V. HAZARDS AND HAZARDOUS MATERIALS: Would the project:					
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	Less Than Significant With Mitigation Incorporated	No	No	No	HAZ-1
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?	Less Than Significant With Mitigation Incorporated	No	No	No	HAZ-4
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	Less Than Significant	No	No	No	None
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	Less Than Significant	No	No	No	None
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	Less Than Significant With Mitigation Incorporated	No	No	No	HAZ-2 and HAZ-3

Environmental Subject Area	Conclusion in 2017 MND And 2021 Addendum No. 1	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
~~f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?~~	Less Than Significant	(NA - Removed from Guidelines)	NA - Removed from Guidelines)	NA - Removed from Guidelines)	NA - Removed from Guidelines)
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	Less Than Significant	No	No	No	None
g) Expose people or structures, either directly or indirectly to a significant risk of loss, injury or death involving wildland fires? ~~including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?~~	Less Than Significant	No	No	No	None

4.3.1 Discussion

Summary of 2017 MND

The Project is not located near a school or on a hazardous waste site. Additionally, the Project would not interfere with an emergency response plan or expose people or structures to wildland fires. Therefore, the 2017 MND identified that these impacts were less than significant.

During construction and operation of the proposed Project facilities, hazardous materials such as fuels and lubricants would be used and have the potential to be released into the environment, causing environmental and/or human exposure to these hazards. Though given the small quantity and the remote nature of the project area, any effects would be less than significant, although the 2017 MND identified a mitigation measure to ensure less than significant impacts.

Because the recharge basins will retain water, the Project has the potential to attract and breed mosquitos and birds. Mosquitos can carry diseases, and residences are located within one-half mile to the south and approximately 2 miles to the east. As such a mitigation measure was required to reduce potential mosquito breeding.

The Project is also located in an area associated with low level (200 to 1,500 feet) military flight paths for Edwards Air Force Base. The 2017 MND cited a Tulare Lake Drainage District (TLDD) study that found that shorebirds such as avocets and stilts have been found to use the shallow-water (generally 0 to 12 inches in depth with gently sloping upland habitat) created by TLDD in managing its system of drainage ponds.

The shallow-water areas did not attract small birds such as doves and larks. At the same time, deeper ponds were found to be used by a variety of ducks.

The 2017 MND concluded that based on the Project type, the recharge areas will not likely attract larger birds such as ducks, geese, and swans but that there is some potential to attract smaller shorebirds. In the Lancaster Palmdale Edwards Air Force Base area, there were no bird strikes recorded in the National Wildlife Strike Database for ducks, geese, swans, hawks, eagles, vultures, falcons, ravens, or gulls. There was also no bird strikes associated with shorebirds. The database does have records of strikes on pigeons, doves, swifts, larks, and sparrows. This is consistent with Edwards AFB bird/aircraft strike hazard (BASH) data suggesting most bird strikes are of small birds and occur near the runways and during low-altitude flight. As such, the 2017 MND identified measures to minimize potential impacts to Edwards Air Force Base during the recharge operations.

2021 Revised Project Analysis

The Project is in the same location and will be constructed as the original project was analyzed by the 2017 MND. Recharge operations will occur in a variety of basins, as assumed by the 2017 MND, and therefore poses a similar attractant for mosquitos and birds.

Proposed Project Change – Treatment Facility Implementation

As discussed in the 2017 Initial Study/MND, the principal federal regulatory agency responsible for the safe use and handling of hazardous materials is the EPA. Other applicable federal regulations are contained primarily in CFR Titles 29, 40, and 49. The federal Resource Conservation and Recovery Act enables the EPA to administer a regulatory program that extends from the manufacture of hazardous materials to their disposal, thus regulating the generation, transportation, treatment, storage, and disposal of hazardous waste at all facilities and sites in the nation.

California regulations are equal to or more stringent than federal regulations. The EPA has granted the State of California primary oversight responsibility to administer and enforce hazardous waste management programs. State regulations require planning and management to ensure that hazardous wastes are handled, stored, and disposed of properly to reduce risks to human and environmental health.

State law requires that:

- Businesses using hazardous materials prepare a plan that describes their facilities, inventories, emergency response plans, and training programs.
- Generators of hazardous waste must complete a manifest that accompanies the waste from generator to transporter to the ultimate disposal location. Copies of the manifest must be filed with the California Department of Toxic Substances and Control.
- Development and implementation of Spill Prevention and Control Plans for facilities using hazardous materials.

On a local or regional scale, the Los Angeles Environmental Health Departments manage many local hazardous materials concerns. Emergency response is often delegated to local fire departments.

Hazardous Materials Use and Transport. The chemicals used for the Treatment Facility would be stored in 3,000-12,000-gallon tanks located within its own concrete containment area that would serve as a secondary containment for spill prevention. Chemical storage and handling areas will require safety equipment (portable eyewash stations) as required for similar facilities The chemicals to be used include:

- Sodium Hypochlorite solution – a maximum of approximately 8,500 gallons of 9 percent to 12.5 percent. Sodium hypochlorite is a clear, slightly yellow or green liquid with a strong chlorine odor. It is usually mixed with water and used as a household cleaner and in water treatment as a disinfectant and a bleaching agent. Hazardous gases/vapors produced are hypochlorous acid, chlorine and hydrochloric acid. Composition depends upon temperature and pH. Additional decomposition products, which depend on pH, temperature and time, are sodium chloride and chlorate, and oxygen. Impacts to humans and animals include immediate pain. Treatment is irrigation with water.

- Ferric Chloride solution – approximately 11,800 gallons of 40 percent. Ferric chloride is an odorless, clear to dark amber colored liquid which can emit toxic fumes of Hydrogen Chloride and Chlorine gas when heated to decomposition. Ferric chloride is within the family of inorganic iron salts and is considered highly corrosive to metals. It is designated as a hazardous substance under Section 311(b)(2)(A) of the Federal Water Pollution Control Act and regulated by the Clean Water Act Amendments of 1977 and 1978. This chemical is subject to regulations regarding its discharge.

- Polymer – approximately 2,900 gallons. Polymers are generally not hazardous as defined by the Occupational Safety and Health Administration (OSHA). It is generally considered a non-irritant and not corrosive.

A percentage of these chemicals ultimately would be concentrated in the settling basins as residual content from the treatment operations, and where the residual material would be cleaned out of the basin concurrent with the recovery schedule of the HDWB, which is estimated at once every five years. Under the Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user to determine whether a substance should be classified as a hazardous waste at the time of disposal. This is due to the fact that product use, transformation, synthesis, mixtures, etc. may change the nature of the product. Therefore, the residual material would be tested prior to disposal to determine if the residual material can be disposed of in a standard landfill or if special handling and disposal would be required.

Implementation of the Treatment Facility includes the Agency's preparation of an Operations and Maintenance Manual (O&MM) would be developed by a certified industrial hygienist, or similarly skilled professional, that would describe safe storage and operations of the Treatment Facility and its chemicals. In addition, implementation of the Treatment Facility would include the implementation of existing Mitigation Measure HAZ-1 which requires the preparation of a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities and operations.

Treatment Facility Basins Bird Attraction Hazards to Aircraft: As discussed in Section 4.2 of this document, the flocculation and sedimentation basin and drying beds may become a bird attraction. However, the Agency would monitor avian usage and implement deterrent measures as required. Edwards Air Force Base lies roughly 35 miles to the east of the site. The 2017 Initial Study/MMD identified Mitigation Measures HAZ-2 and HAZ-3 to reduce potential impacts of bird attraction conflicts between the HDWB operations and Edwards Air Force Base. Implementation of the Treatment Facility requires minor modifications to Mitigation Measures HAZ-2 and HAZ-3 to ensure that the Treatment Facility operations are included. Implementation of Mitigation Measures HAZ-2 and HAZ-3, as modified, would reduce potential impacts of the implementation of the Treatment Facility to less than significant.

Therefore, because the Treatment Facility would be operated in accordance with all federal, State and local regulations, and existing mitigation measures to reduce HDWB project impacts are also applicable to the Project Change of implementing a Treatment Facility, the impact is less than significant.

4.3.2 Mitigation Measures

The 2017 MND identified the following mitigation measure to reduce impacts to less than significant:

HAZ-1 Spill Prevention Plan – Consistent with Agency's existing practices, the Agency will require from its construction contractors the preparation and implementation of a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities and operations. The plan and methods shall be in conformance with all State and Federal regulations. The Agency shall provide for routine inspection of the construction and operations areas to verify that the measures specified in the SPCCP are properly implemented and maintained and further ensure that contractors are notified immediately if there is a noncompliance issue and will require compliance.

HAZ-2 Bird Strike Hazard Notification – The Agency will notify the Flight Safety Office at Edwards Air Force Base and all local airports of the potential bird strike hazard as follows:

- Prior to application of water to the recharge basins, and
- If large birds or large concentrations of small birds are observed in or near the recharge area.

HAZ-3 Bird Strike Hazard Minimization Measures – The Agency will implement actions to reduce the attractiveness of the recharges basins to birds by:

- Use of recharge basins with shallow water depths which will be generally unsuitable for the larger migratory birds.
- Monitor recharge area water and if aquatic macroinvertebrates are found to be developing in large numbers and/or foraging by shorebirds is observed, temporarily dry

out recharge areas, thereby reducing the insect and aquatic macroinvertebrate forage that would attract and hold shorebirds.

- Whenever water is present in the recharge basins, the project operator will monitor the basins daily for bird activity and if found discourage their use via means acceptable to the Department of Fish and Wildlife.

HAZ-4 Mosquito Borne Disease Minimization Measures – The Agency will consult with the Antelope Valley Mosquito and Vector Control District to develop and implement a mosquito management plan. The plan would consist of a Project specific mosquito abatement program that would include quantitative abatement thresholds. The Agency and/or its representative would monitor mosquito larvae production in the recharge basins, drainages, and distribution. Larvae populations would be tracked using methods and thresholds approved by the Mosquito Abatement District, and suppression measures would be employed when thresholds are exceeded. The primacy mode of suppression would be to monitor for mosquito presence and if mosquito larvae are found, to cycle recharge temporarily so that units of recharge would be dried.

Revisions to Mitigation Measures:

The Project Change of the implementation of a Treatment Facility would require the modification of the following mitigation measures to ensure impacts are less than significant. These modifications are not significant and serve to strengthen the existing measure, not replace it or reject it. Underlined text (underlined text) represents additions to the measure and strikeout text (~~strikeout~~ text) represents deleted text as follows:

HAZ-2 Bird Strike Hazard Notification – The Agency will notify the Flight Safety Office at Edwards Air Force Base and all local airports of the potential bird strike hazard as follows:

- Prior to application of water to the recharge basins, and prior to beginning recovery operations where use of the Treatment Facility begins, and

- If large birds or large concentrations of small birds are observed in or near the recharge and/or Treatment Facility areas.

HAZ-3 Bird Strike Hazard Minimization Measures – The Agency will implement actions to reduce the attractiveness of the recharge and flocculation/sedimentation basins to birds by:

- Use of recharge basins with shallow water depths which will be generally unsuitable for the larger migratory birds.

- Monitor recharge area water and if aquatic macroinvertebrates are found to be developing in large numbers and/or foraging by shorebirds is observed, temporarily dry

out recharge areas, thereby reducing the insect and aquatic macroinvertebrate forage that would attract and hold shorebirds.

- Whenever water is present in the recharge basins and Treatment Facility basins and drying beds, the project operator will monitor the basins daily for bird activity and if found discourage their use via means acceptable to the Department of Fish and Wildlife.

4.3.3 Conclusion

The Proposed Project Change does not change the type or extent of development analyzed in the 2017 Initial Study or the 2021 Addendum No. 1. Applicable mitigation measures previously identified in the 2017 MND and 2021 Addendum No. 1 will be required as set forth in the MMRP. Although Mitigation Measures HAZ-2 and HAZ-3 have been slightly modified to clarify that these measures would also apply to implementation of the Treatment Facility, no considerably different mitigation measures that may substantially reduce impacts have been identified or rejected. The Proposed Project Change of implementing the Treatment Facility would not involve new significant or more severe impacts to Hazards and Hazardous Materials than those previously identified and analyzed in the 2017 Initial Study or 2021 Addendum No. 1. Therefore, none of the conditions described in CEQA Guidelines Section 15162 calling for preparation of a subsequent EIR have occurred with respect Hazards and Hazardous Materials.

4.4 HYDROLOGY AND WATER QUALITY

Environmental Subject Area	Conclusion in 2017 MND And 2021 Addendum No. 1	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
VI. HYDROLOGY AND WATER QUALITY: Would the project:					
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	Less Than Significant With Mitigation Incorporated	No	No	No	HWQ-4
b) Substantially ~~deplete~~ decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin ~~there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)~~?	Less Than Significant With Mitigation Incorporated	No	No	No	HWQ-4
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner which would:	Less Than Significant With Mitigation Incorporated (also applies to all subcriteria)	No (also applies to all subcriteria)	No (also applies to all subcriteria)	No (also applies to all subcriteria)	HWQ-1, HWQ-2, HWQ-3, HWQ-5 (also applies to all subcriteria)
• result in substantial erosion or siltation onsite or offsite;					
• substantially increase the rate or amount of surface water runoff in a manner which would result in flooding on or offsite;					

Environmental Subject Area	**Conclusion in 2017 MND And 2021 Addendum No. 1**	**Do the Proposed Changes Involve New or More Severe Impacts?**	**New Circumstances Involving New or More Severe Impacts?**	**New Information Requiring New Analysis or Verification?**	**Mitigation Measures**
• create or contribute to runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or					
• impede or redirect flood flows?					
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	Less Than Significant	No	No	No	None
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	Less Than Significant	No	No	No	None
~~d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?~~	Refer to Criterion X(c)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)
~~e) 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?~~	Refer to Criterion X(c)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)
~~f) Otherwise substantially degrade water quality?~~	Refer to Criterion X(a)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)
~~g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?~~	Refer to Criterion X(c)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)

Environmental Subject Area	Conclusion in 2017 MND And 2021 Addendum No. 1	Do the Proposed Changes Involve New or More Severe Impacts?	New Circumstances Involving New or More Severe Impacts?	New Information Requiring New Analysis or Verification?	Mitigation Measures
~~h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?~~	Refer to Criterion X(c)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)
~~i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?~~	Refer to Criterion X(c)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)
~~j) Inundation by seiche, tsunami, or mudflow?~~	Refer to Criterion X(c)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)	(N/A – Guidelines Revised)

4.4.1 Discussion

Summary of 2017 MND

Water Quality. The 2017 MND identified that the SWP water would be blended with the regional groundwater as it is absorbed into the ground. Based on various testing data, both recharged water and indigenous water are generally suitable for drinking water purposes. Considering that the blending of the indigenous and SWP water supplies is not likely to change the water quality significantly such that it would result in concentrations above the Maximum Contaminant Levels (MCLs), operations related to groundwater recovery and delivery of the recovered water back to the California Aqueduct are not anticipated to cause any adverse impact. No external treatment system is needed for either the SWP supply or the groundwater. The 2017 MND identified that the Agency will work with and comply with DWR's requirements in the development and implementation of a pump in program including monitoring of water quality of water being pumped into the Aqueduct.

The 2017 MND identified that recharge operations have the potential to raise groundwater levels to where it may interfere with the few septic systems in the surrounding area. Mitigation was implemented to monitor and change recharge operations as necessary to maintain the groundwater level below 75 ft. (100 ft is the level considered a greater risk of nitrate contamination).

Groundwater Supplies and Recharge: The 2017 MND identified that groundwater recharge will generally raise groundwater levels when compared to no project conditions and will benefit adjacent private well owners by reducing the cost of pumping supplies. The 2017 MND also identified that the Agency's recovery operations during drought may result in lower water levels in nearby wells and localized declines in water levels may reduce well production somewhat and raise well pumping costs. Mitigation was required to ensure that net extractions of groundwater by the Agency and its partners will not exceed 90 percent of the volume of water recharged.

Change in Drainage Patterns. The Project site has seven major tributary streams. The slope of the land in the vicinity of project drains from southwest to east. The Project would preserve existing topography and not significantly alter existing drainage patterns.

The 2017 MND identified that "a typical recharge program, involving the construction of large, permanent berms to retain flow would result in a significant change in the drainage patterns in the area and in particular would preclude flood flows from passing through the recharge area, thus diverting flows to adjacent properties." The 2017 Original project design proposed not to isolate the site from flood flows but, instead, the design would utilize flood irrigation methods to where only temporary berms of not greater than about 36 inches in height would be installed to retain some stormwater for recharge, but in general, be sacrificial, or wash away, to mimic natural flood conditions. Drainage flows would enter the recharge area, temporarily be constrained by the low berms, and then overtop and flow from one berm to the next until breaching the last berm on the eastern end of the property. A beneficial effect of the sacrificial berms was identified as that it would temporarily detain flood flows, allow for some percolation of these flows into the ground, and then allow flow to exit the site in a manner similar to pre-project conditions. Berms will also retain and recharge low flow storm runoff.

Consistency with Groundwater Plans. The 2017 MND identified that the Project (a) does not affect the beneficial use of the stored supplies, at any blend of SWP and indigenous groundwater and (b) has somewhat greater benefits than adverse impacts associated with mass loading of minerals as the concentration (mg/l) in the blended water is such that it does not change the intended beneficial use of the water.

2021 Revised Project Analysis

Water Quality. The SWP water would still be blended with the regional groundwater as it is absorbed into the ground, and there is no change to this feature. The 2017 MND identified that the SWP and the regional groundwater are compatible, and neither need treatment. A rise in groundwater is also anticipated with the revised project design, and operations will be adjusted as needed based on monitoring as with the original design. Therefore, there is no change.

Groundwater Supplies and Recharge: The recharge operations will also generally raise groundwater levels when compared to no project conditions, creating the same benefit of reduced pumping costs for adjacent private well owners. Additionally, the Agency's recovery operation during drought may also result in lower water levels in nearby wells and localized declines in water levels may reduce well production somewhat and raise well pumping costs. Mitigation was required to reduce potential impacts to adjacent private wells, and the revised design incorporates the monitoring requirement.

Change in Drainage Patterns. The Project site has seven major tributary streams. The 2017 MND identified that "a typical recharge program, involving the construction of large, permanent berms to retain flow would result in a significant change in the drainage patterns in the area and in particular would preclude flood flows from passing through the recharge area, thus diverting flows to adjacent properties." The 2021 Revised Project Design constitutes a "typical recharge program…" as described by the 2017 MND.

However, a Drainage Evaluation was prepared for the 2021 Revised Project Design (Appendix E) that further defined flood flow across the Project site. The revised design focuses the fixed basins outside of

the areas where storm flows are heaviest and provides protection for some of the basins, removing the sacrificial nature of the basins. As such, the basin placement throughout the Project area are designed in a manner that will still allow the main flood flows to pass through the Project area, continuing in normal patterns, and not divert flows onto adjacent properties.

The 2021 Revised Project Design constitutes a hybrid recharge program with some "typical" basins and some sacrificial basins. A Drainage Evaluation was prepared for the 2021 Revised Project Design (Appendix E) that defined flood flow across the Project site. The revised design focuses the fixed basins outside of the areas where storm flows are heaviest and provides protection for these basins, removing the sacrificial nature of these basins. Basins within the floodways will remain as sacrificial as intended in the original design. As such, the basin placement throughout the Project area is designed in a manner that will still allow the main flood flows to pass through the Project area, continuing in normal patterns, and not divert flows onto adjacent properties. Flood flows will still enter the sacrificial berm area, recharge during small storm events, and overtop the berms in larger storm events. Sheet flows will likely not enter the flood protected basins.

Consistency with Groundwater Plans. The 2017 MND identified that the Project (a) does not affect the beneficial use of the stored supplies, at any blend of SWP and indigenous groundwater and (b) has somewhat greater benefits than adverse impacts associated with mass loading of minerals as the concentration (mg/l) in the blended water is such that it does not change the intended beneficial use of the water.

Proposed Project Change – Treatment Facility Implementation

Water Quality. During implementation of the well drilling and testing phase of the HDWB project in 2021 and 2022, it was discovered that arsenic naturally occurs in deeper portions of the aquifer across a wider range of the Project Site than originally anticipated during the December 2017 Original Initial Study/MND and 2021 Addendum 1 preparation. Water quality testing of newly drilled wells identifies that arsenic was discovered below 500 feet below ground surface (bgs) at between 11 and 19 micrograms per liter (ug/L).

According to DWR, the average and maximum arsenic concentrations historically found in the SWP are 2 and 4 micrograms per liter, respectively. There is no set limit on the maximum allowable concentrations of any constituent to be pumped in as part of a pump-in program and instead, the overall effects of the program are considered when implementing a pump-in program. Data from the 2021 and 2022 site development suggest a fairly consistent arsenic concentration in newly drilled wells across the Project Site that are above the maximum historical background SWP level and therefore would require referral to DWR's Pump-In Facilitation Group for analysis and acceptance. The arsenic levels are high enough that it is unlikely that the Facilitation Group would accept the recovered water in most cases without treatment. Therefore, for the HDWB to operate and return water to the SWP, the water would need to have at least a percentage of arsenic removed to a level that would be acceptable to the Facilitation Group based on review of the DWR Water Quality Policy and Implementation Process for Acceptance of Non-Project Water into the State Water Project (October 2012).

The treatment facility is expected to remove approximately 75 percent of the naturally occurring arsenic concentrations found in the recovered water. Conceptually, this would bring maximum arsenic levels down to levels would be within the range acceptable for Pump-In to the DWR aqueduct. Treatment operations would be balanced with a blending strategy where treated water may be blended in the

pipelines with untreated recovered water prior to pump-in to the SWP. An approved Pump-In Agreement with DWR would outline the testing and modeling requirements to ensure pump-in program impacts to downstream SWP water quality are acceptable to DWR.

Prior to pump-in to the SWP, the Agency would complete water quality tests and make adjustments as necessary to ensure compliance with the DWR Pump-In Agreement. The Treatment Facility construction is subject to a SWPPP and the preparation of a Spill Pollution and Prevention Plan which would reduce potential impacts to surface waters. Therefore, implementation of the Treatment Facility would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality.

Existing Drainage Pattern Alteration. The 55-acre treatment facility would be located in the area of the intersection of 294th Street and Avenue B, south of the Oso Canyon Floodway and north of proposed groundwater recharge basins. The Hydrology Report prepared for the HDWB Project identifies that the Treatment Facility would be located within FEMA Zone X, defined as "Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from the 1% annual chance flood", with the "areas of 1% annual chance flood with average depths of less than 1 foot" definition being the most applicable at this location (**Figure 6 - *FEMA Flood Insurance Rate Map***, refer to 2021 Addendum No. 1 - Initial Drainage Evaluation for AVEK-High Desert Water Bank, Final Report, Stantec, March 1, 2021).

To ensure the Treatment Facility is not inundated by any flood flows in the area, a 5-foot-high pad area would be constructed from the native soil onsite. Rip rap would be installed around the edges for additional protection.

As the Project Change which is the implementation of the Treatment Facility is not within a major floodway or drainage course, the impacts of implementing the Treatment Facility are less than significant.

4.4.2 Mitigation Measures

The 2017 MND identified the following mitigation measure to reduce impacts to less than significant, and the 2021 Addendum No 1 modified Mitigation Measure HWQ-1 (as identified in underlined type below):

HWQ-1 **Drainage Design** - Recharge areas in Pescado Creek and Oso Canyon floodways will be constructed so that they will not divert sheet flooding and other runoff away from the low, earthen berms that will be constructed within the creek areas that will be used to enhanced the fixed recharge areas. This will allow flood water to flow into the creek areas ~~recharge areas~~ where flows will be somewhat retarded by the recharge berms. Berms will be designed with berm heights below the calculated flood depth elevations and intended to be sacrificial. Flood flows would enter the site, be primarily channeled through the floodways go through the berms that are installed within the floodways, overtop or destroy the berms in sequence, and eventually exit the project site along the eastern boundary of the proposed project in a manner similar to pre-project conditions.

HWQ-2 **Stormwater Pollution Prevention Plan (SWPPP)** - To reduce or eliminate Construction related water quality effects, before onset of any construction activities, the Agency or its contractor will prepare a Storm Water Pollution Prevention Plan. The SWPPP will include

temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover). These measures will be employed to control erosion from disturbed areas. Measures for the control of pollutants during construction include:

- Use of existing access points to minimize dust and tracking materials onto Public Streets,
- Designated Parking, Storage, and Service Areas protected by silt fence and oil absorbents and sloped to control drainage,
- Minimize diesel storage,
- Stockpile spill cleanup materials,
- Regular vehicle inspection for leaks.
- Fuel off-channel with a secondary containment system for spills,
- Use quick connects whenever possible,
- Fueling by authorized personnel only, and
- Spill cleanup materials readily available.

The SWPPP shall include a Fugitive Dust Control Plan (FDCP) that will include extensive measures to control and manage soil erosion. The FDCP will provide for management of open soils that will contribute to management of runoff.

Consistent with the SWPPP and the Agency's current construction management practices, the Agency or its agent will perform routine inspections of the construction area to verify that the BMPs specified in the SWPPP are properly implemented and maintained. The Agency will notify its contractors immediately if there is a noncompliance issue and will require compliance.

HWQ-3 **Spill Prevention Plan** - Consistent with Agency's existing practices, the Agency will require from its construction contractors the preparation and implementation of a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities and operations. The plan and methods shall be in conformance with all State and Federal regulations. The Agency shall provide for routine inspection of the construction and operations areas to verify that the measures specified in the SPCCP are properly implemented and maintained and further ensure that contractors are notified immediately if there is a noncompliance issue and will require compliance.

HWQ-4 **Protection of Off-Site Wells**. To address potential impacts to groundwater and adjacent well owners, the Agency will develop a monitoring program to monitor changes in water

levels and well production in the area affected by groundwater recharge operations. The program will specify that:

- Extractions of groundwater shall not exceed 90% of the amount of water recharged,
- Water quality in recovered water and in groundwater flowing away from the Project will be monitored to ensure that water quality remains appropriate for designated beneficial uses,
- During recharge operations, water levels will be monitored and recharge operations will be suspended in the event that offsite water levels rise to within 75 feet of the ground surface, and
- During recovery operations, water levels in offsite wells will be monitored and operations will be adjusted if offsite wells are found to be adversely affected by project operations,

HWQ-5 **Management of Herbicides and Pesticides** - The Agency will comply with all regulations of the California Department of Pesticide Regulation regarding the use of herbicides and pesticides in areas designated for groundwater recharge.

Revisions to Mitigation Measures:

The Proposed Project Change of the implementation of a Treatment Facility would be required to comply with Mitigation Measures HWQ-1 through HWQ-5, and the Agency agrees that these are feasible mitigation. The Proposed Project Change does not require a modification of the existing mitigation measures nor does it require any new measures to reduce impacts to Hydrology and Water Quality to less than significant.

4.4.3 Conclusion

The Proposed Project Change does not change the type or extent of development analyzed in the 2017 Initial Study or the 2021 Addendum No. 1. Applicable mitigation measures previously identified in the 2017 MND and 2021 Addendum No. 1 will be required as set forth in the MMRP, and no considerably different mitigation measures that may substantially reduce impacts have been identified or rejected. The Proposed Project Change of implementing the Treatment Facility would not involve new significant or more severe impacts to Hydrology and Water Quality than those previously identified and analyzed in the 2017 Initial Study or 2021 Addendum No. 1. Therefore, none of the conditions described in CEQA Guidelines Section 15162 calling for preparation of a subsequent EIR have occurred with respect to Hydrology and Water Quality resources.

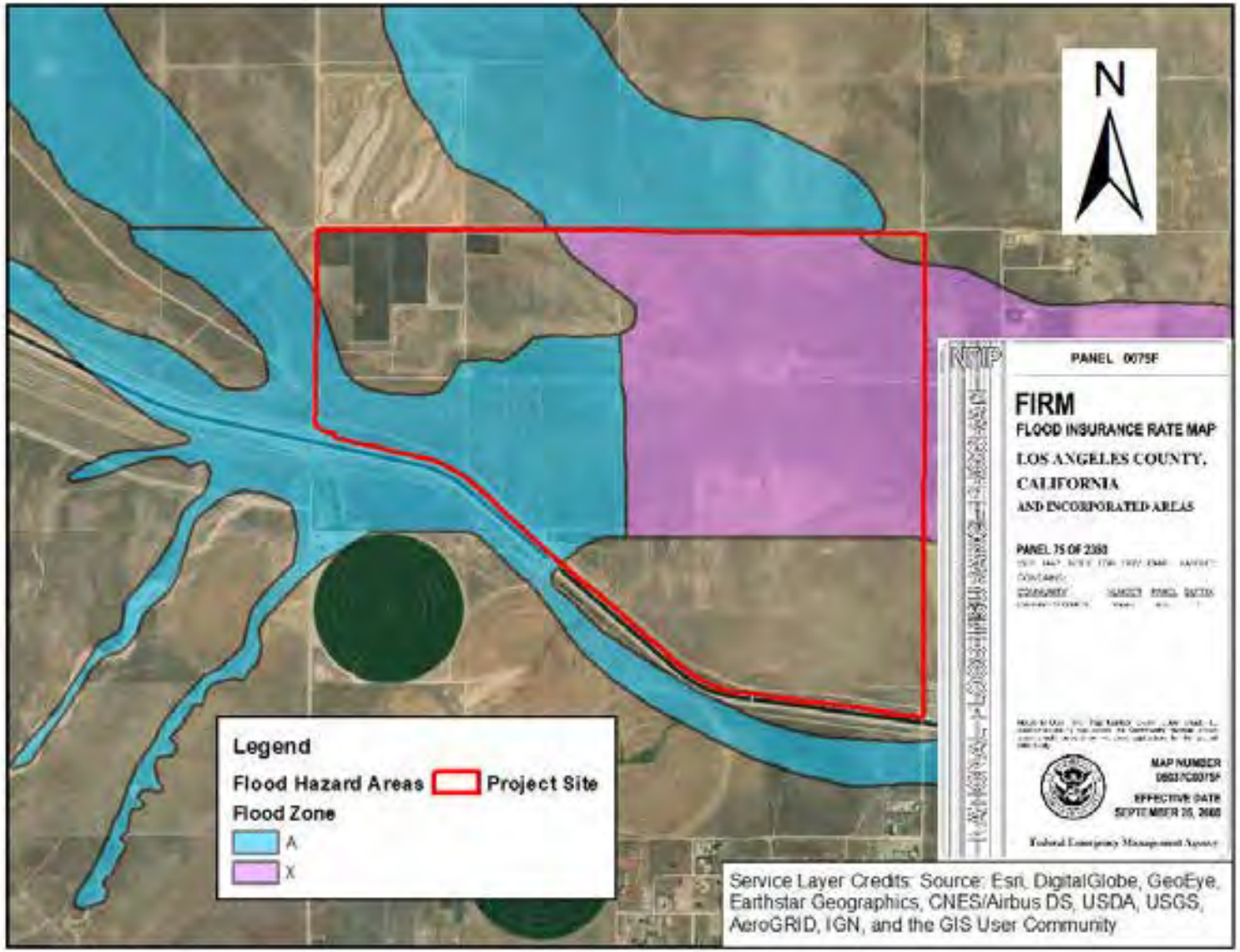


Figure 6: FEMA Flood Insurance Rate Map
Initial Study Addendum No. 2
High Desert Water Bank

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ADDENDUM TO MITIGATED NEGATIVE DECLARATION FOR

Antelope Valley-East Kern High Desert Water Bank Project

Addendum No. 3

Introduction:

In December 2017, the Antelope Valley East Kern Water Agency (AVEK or Agency) adopted a Mitigated Negative Declaration (MND), SCH Number 2017061030, that was based on an Initial Study prepared for the High Desert Water Bank (HDWB).

In September 2021, AVEK prepared Addendum No. 1 to the HDWB MND in accordance with CEQA Guidelines Sections 15162 and 15164. The purpose of Addendum No. 1 was to evaluate various components of the Project design (identified in 2021 Addendum No. 1 as 2021 *Revised Project Design*) that were changed and/or optimized since the time the environmental impacts of the original design were analyzed in 2017 (Project or 2017 Original Project Design), including a revised aqueduct turnout design, a change in the recharge and recovery transmission facilities from a combination of aboveground pipeline (Main) and below ground pipelines to all underground pipelines, a change in design of the recharge facilities, increasing the number of groundwater extraction wells from 18 to 28 and the depth of the wells from 500 feet to a range of 600 feet to 1,200 feet, and constructing a 100 CFS booster pump station only instead of a 150 CFS booster pump station with a 250,000-gallon storage tank and a new pump station building. Addendum No. 1 concluded that none of the conditions described in CEQA Guidelines Section 15162 calling for preparation of a subsequent Initial Study/Mitigated Negative Declaration had occurred with respect to any of the Environmental Subject Areas in the most current CEQA Guidelines. Therefore, the Agency could approve an Addendum to the Initial Study under CEQA Guidelines Section 15164. The Agency's board approved Addendum No. 1 on October 26, 2021, and filed a Notice of Determination for Addendum No. 1 on December 13, 2021 (SCH Number 2021269205).

In November 2022, AVEK prepared Addendum No. 2 to the HDWB MND, in accordance with CEQA Guidelines Sections 15162 and 15164. The purpose of Addendum No. 2 was to incorporate a treatment facility to remove arsenic that naturally occurs in deeper portions of the aquifer and across a wider range of the Project Site than originally anticipated during the December 2017 Original Initial Study and 2021 Addendum No. 1 preparation. Water quality testing of newly drilled wells confirmed that arsenic was below 500 feet below ground surface (bgs) at between 11 and 19 micrograms per liter (µg/L). Water returned from the HDWB must meet certain water quality standards prior to being pumped back into the State Water Project (SWP). To reduce arsenic concentrations in recovered water prior to pump-in to the SWP, the Agency preliminarily plans to construct an arsenic treatment facility that utilizes an oxidation, coagulation, and sedimentation process in concrete-lined basins within a 55-acre area of its HDWB. The Agency's board approved Addendum No. 2 on December 20, 2022, and filed a

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Notice of Determination for Addendum No. 2 on December 29, 2022 (SCH Number 2022279121).

Project Description:

The HDWB involves the development and operation of a groundwater bank on approximately 1,500 acres of land in the western edges of the Antelope Valley. The Project would store SWP water supplies from the Agency and other banking participants during wet weather year periods when supplies exceed demands and would recover the water for use by the Agency and its partners during dry weather years when demands exceed supplies and other times when there are disruptions to SWP supplies. Implementation of this Project will require the construction of monitoring and production water wells, turnout(s) from the California Aqueduct, East Branch, underground and above-ground pipelines, recharge basins, and water storage and booster pump facilities.

Minor Revisions:

This Addendum No. 3 makes the following minor revisions to Addendum No. 2 to clarify certain information related to water quality and treatment (deleted text is shown in strikeout, and added text is shown in underline):

- Page 1 and page 41 – Revised: "During implementation of the well drilling and testing phase of the HDWB project in 2021 and 2022, it was ~~discovered~~ confirmed that arsenic naturally occurs in deeper portions of the aquifer across a wider range of the Project Site than originally anticipated during the December 2017 Original Initial Study and 2021 Addendum 1 preparation."

  Revised: "Water quality testing of newly drilled wells ~~identified~~ demonstrated that arsenic ~~was discovered~~ occurs below 500 feet below ground surface (bgs) at between 11 and 19 micrograms per liter (µg/L)."

- Page 2 and page 41 – Deleted: ~~"However, there is no set limit on the maximum allowable concentrations of any constituent to be pumped in as part of a pump-in program and instead, the overall effects of the program are considered when implementing a pump-in program."~~

  Added: "All water entering the State Water project must comply with DWR's Water Quality Policy and Implementation Process for Acceptance of Non-Project Water into the State Water Project."

- Page 3 – Revised: "The Treatment Facility would be utilized during recovery operations, typically during dry years when demands exceed supplies, to meet arsenic concentrations allowable to be pumped in to the SWP in accordance with DWR's policies, ~~and~~ the Pump-In Agreement approved by the SWP Facilitation Group, and

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Metropolitan's Board adopted policy governing the introduction of new water sources into conveyance facilities through the term of the agreement with Metropolitan."

- Page 3 – Deleted: ~~"It is anticipated that recharge of SWP water into the groundwater basin may have a dilution effect such that recovered water quality improves over time with respect to arsenic concentrations"~~

- Page 5 – Revised: "~~Material~~ Safety Data Sheets (~~M~~SDSs) for the chemicals used would be provided to employees as required by the California Occupational Safety and Health Administration (CAL/O~~H~~SHA)."

- Page 10 – Deleted: ~~"When determining acceptable levels DWR will consider the in-situ blending effect of pumped-in water with SWP water."~~

- Added: "If water quality exceeds primary drinking water standards, the water shall be treated or blended before it enters the SWP to prevent water quality impacts."

- Page 22 – Revised: "Sediment generated by the treatment process will be left in the basins until dry, and the water content in the sludge will be managed and dust generation monitored during periods of high winds to ensure that a negligible amount of dust, if any, will be emitted during the drying period before taking it offsite for disposal. This is typical operating procedure for a treatment facility as such. ~~the timing of which is not known at this time~~. The drying sediment is not anticipated to generate substantial odors regularly but may emit a mild odor during warmer months."

- Page 33 –Added: "Acid may be added to lower pH to increase arsenic removal."

- Pages 41 to 42 – Revised: "The treatment facility is expected to remove approximately 75 percent of the naturally occurring arsenic concentrations found in the recovered water. Conceptually, this would bring maximum arsenic levels down to levels which would be within the range acceptable for Pump-In to the DWR aqueduct. Treatment operations would be balanced with a blending strategy where treated water may be blended in the pipelines with untreated recovered water prior to pump-in to the SWP. Because additional wells are yet to be drilled and tested for water quality, and additional groundwater modeling is to be conducted, it is recognized that other Constituents of Concern (COCs) besides arsenic may be identified as requiring treatment. Updated modeling and future water quality testing will help determine the need for treatment of other COCs. An approved Pump-In Agreement with DWR would outline the testing and modeling requirements to ensure pump-in program impacts to downstream SWP water quality are acceptable to DWR.

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Basis for Preparation of Addendum

CEQA Guidelines Section 15164 governs the preparation and adoption of addenda. Under CEQA Guidelines Section 15164(b), an addendum to a certified EIR or negative declaration is needed if only minor technical changes or modifications to the proposed project are necessary. An addendum is appropriate, however, only if these minor technical changes or modifications do not result in any new significant impacts as described in Section 15162, calling for the preparation of a subsequent EIR or negative declaration. Further, under CEQA Guidelines Section 15164(c), an addendum need not be circulated for public review; instead, under CEQA Guidelines Section 15164(d), it need only be considered by the decision-making body prior to deciding on the project. As a responsible agency that will consider approving the above-described changes to the project, Metropolitan will consider this Addendum for adoption in accordance with the requirements of CEQA Guidelines Section 15164.

This Addendum, therefore, demonstrates that the environmental analysis, impacts, and mitigation requirements identified in the MND remain substantially unchanged by the minor technical issues described herein and supports the finding that the proposed project modification does not raise any new issues and does not exceed the level of impacts identified in the MND. This Addendum was therefore prepared because the minor textual revisions provided herein would:

1) not constitute a substantial change in the project as approved by AVEK;

2) not lead to substantial changes in the circumstances under which the project is undertaken; and

3) not constitute new information or substantial importance which was not known and could not have been known with the exercise of reasonable diligence at the time the MND was adopted.

DocuSigned by:
Jennifer A. Harriger
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Signature

8/29/2023

Date

Jennifer A. Harriger

Printed Name

Manager, Environmental Planning Section

Title

One Water and Stewardship Committee

Authorize $80 million for additional project costs for the AVEK High Desert Water Bank Program

Item 8-3

September 11, 2023

Outline

- Background
- Current status
- Changed conditions and costs
- Committee feedback
- Alternatives considered
- Remaining items
- Summary

Background

Board authorized in April 2019

Capital costs up to $131 million

- Estimated project unit cost: $320/AF

Program size:

- Storage capacity of 280,000 AF
- Put/take capability of 70,000 AFY
- Would more than double existing direct pump-back

Agreement term: 2019 - 2037

- 20-year no cost option to extend

Background

Initial project design

- Pumped and gravity-fed recharge basins
- 23 recovery wells
- Two turnouts
- Off-site power upgrades not included

Gravity Recharge

Pumped Recharge

Current Status

Where we are today

- Provided about $65 million to date
- Completed construction of 10 recovery wells, turnout, and stage 1 recharge basins
- Could begin recharging this month (12,000 AF)
- Full project operation delayed to 2027 due to off-site power upgrades schedule

Changed Conditions

- Inflation has driven up costs
- Design evolved to meet recovery target and implemented various design enhancements
- Upgrades to off-site power distribution system needed to support project facilities
- Different water quality conditions in deeper aquifer

Inflation has driven costs up

Changed Conditions

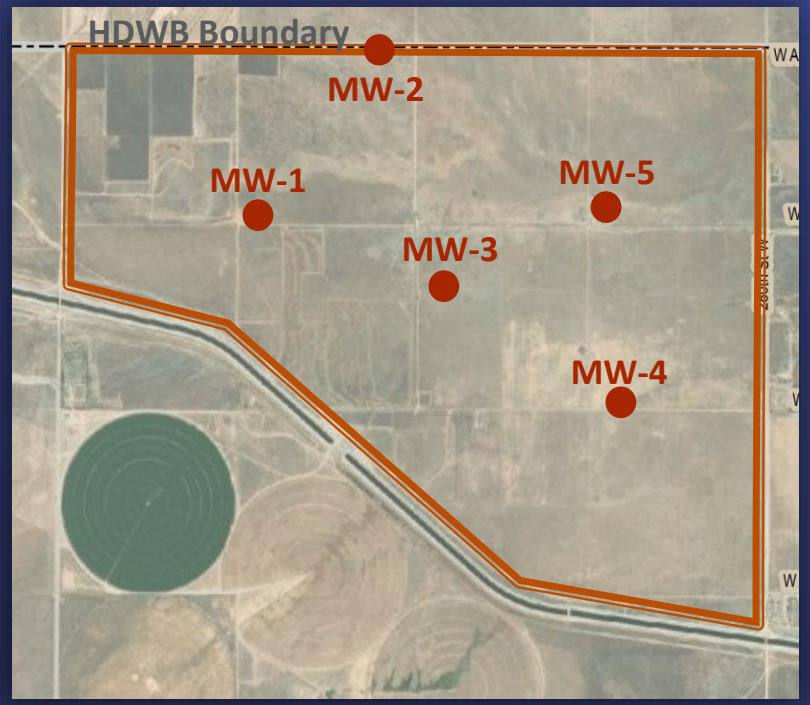
- Inflation of project costs
  - Increased material and construction costs
  - Supply chain issues affecting ability to acquire materials/equipment
- 2018 Capital Cost Calculation
  - Assumed an annual O&M cost increase of 3%
- 2022 California Construction Cost Index
  - Cost increase between 2018 and 2022 of 30%
- Estimated additional cost: $54 M
  - Assumes annual inflation rate of 8% for future construction

Design evolved to meet program parameters

Changed Conditions

Wells

- AVEK drilled and tested five monitoring wells
  - Depth of ~500 ft
  - Testing indicated that water quality met all drinking water standards
- Updated monitoring well data and groundwater modeling showed need for deeper well design
  - Depth of ~1000 ft

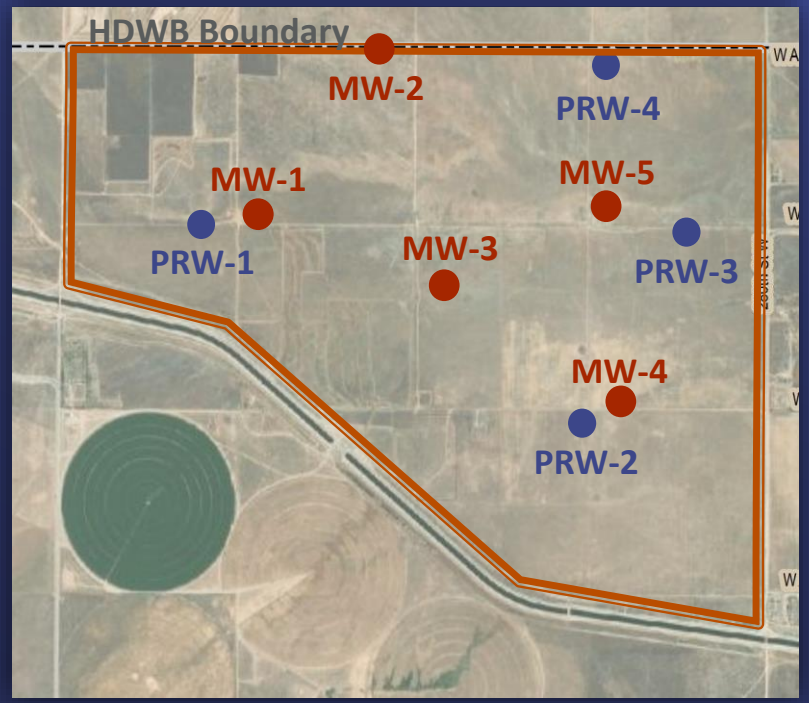


Design evolved to meet program parameters

Changed Conditions

Wells

- Updated recovery (deeper) well data and modeling showed need for additional four wells
  - Total number of wells increases from 23 to 27
- Increased capital cost estimate: $29M

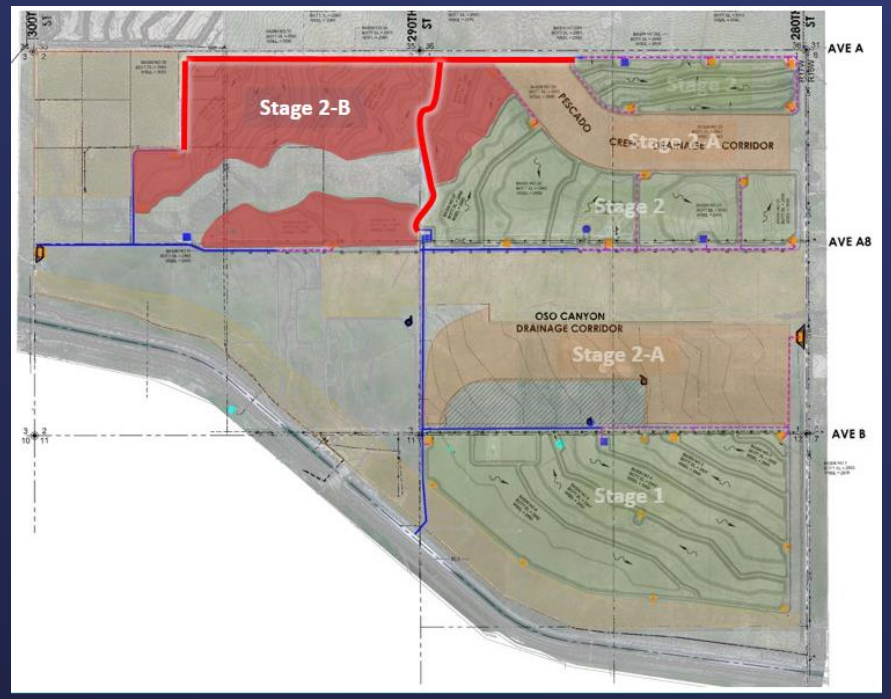


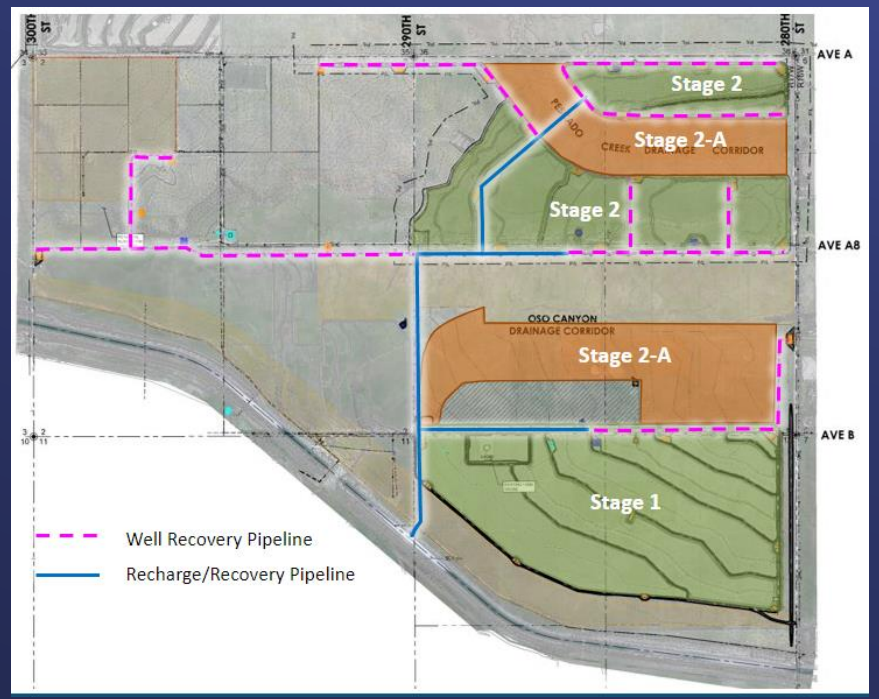
Changed Conditions

Recharge Basins

Design enhancements

- Removal of pumped basins and pumping
  - Gravity recharge basins only
  - Increased berms
- Avoided an additional cost of about $27M



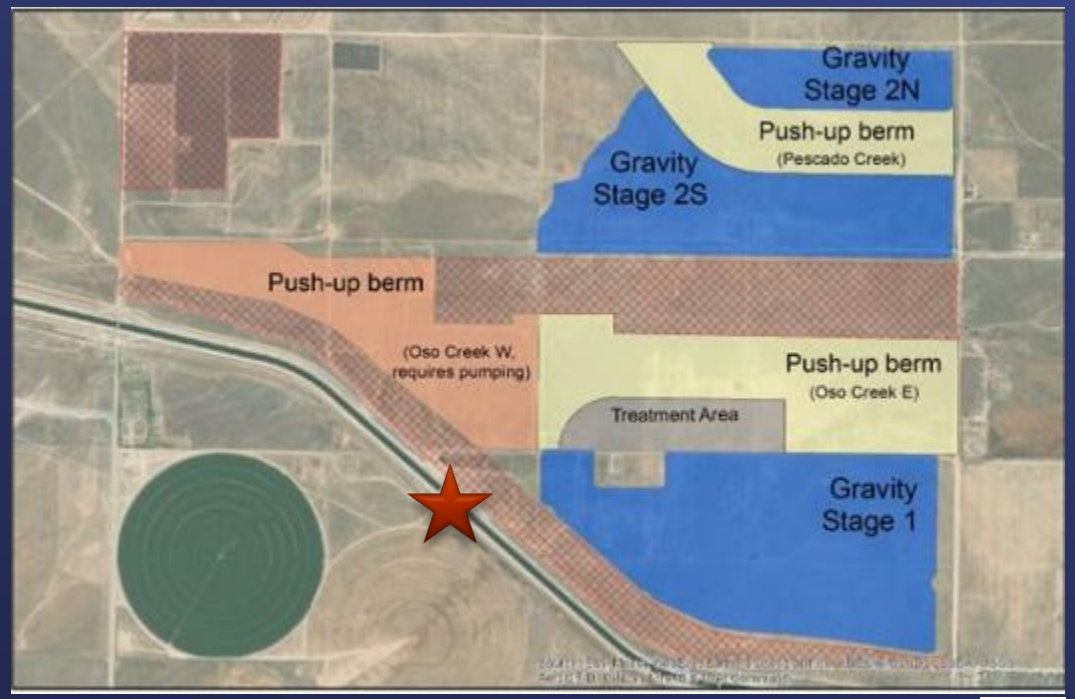


Changed Conditions

Various

Design enhancements

- Implemented flood protection and engineered-basins into design
  - Protects investment
  - Reduces downtime during wet periods
- Modified from two to one turnout structure
- Increased capital cost estimate: $13M



Upgrades to off-site power needed

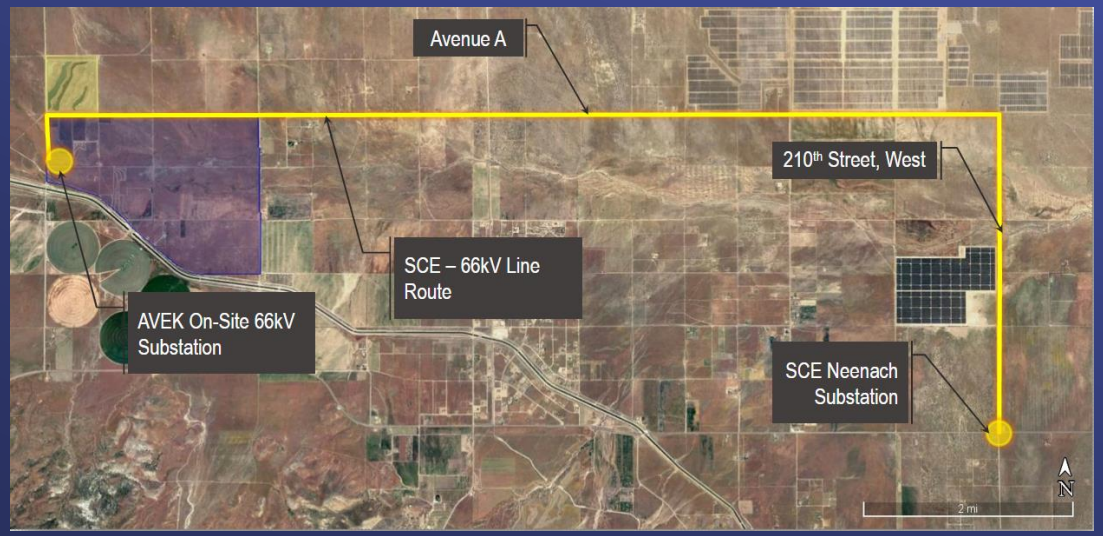
Changed Conditions

- Power distribution system consists of on-site and off-site facilities
  - On-site power costs included in 2018 estimate
  - Off-site power costs not included in 2018 estimate
  - SCE completed Method of Service study in 2022

Changed Conditions

Upgrades to off-site power needed

- Will be designed and constructed by SCE
  - Transmission Line
  - Substation
- Shared costs between SCE and AVEK (Metropolitan)
  - AVEK's share is $11M of $78M
  - SCE requires AVEK to enter into Letter of Agreement (LOA) and full payment before beginning design
  - Proportionate cost share may increase upon completion of LOA



Different water quality conditions in deeper aquifer

Changed Conditions

- Initial field investigation and testing
  - All water quality samples met Title 22 Drinking Water Standards in shallower wells
- Arsenic levels in deeper wells from 8 – 20 µg/L (MCL is 10 µg/L)
  - Naturally occurring
  - Modeling shows arsenic is widespread throughout the basin, more concentrated in the deeper aquifer
  - Treatment is required
- Nitrate levels in recovery wells from 2.7 – 5.9 mg/L-N (MCL is 10 mg/L-N)
  - Higher than ambient levels in CA Aqueduct
  - Looking into impacts to our source and treated water

Changed Conditions

Deferred request for treatment authorization

- Further groundwater modeling and analysis is ongoing
- Will better understand arsenic's behavior, evaluate nitrate trends, and identify other Constituents of Concern (COCs)
- Modeling will be used to optimize the treatment system design and evaluate potential impacts to nearby wells

Changes in Cost

- Cost increases of $80 million (total of $211 M)

Factors Contributing to Changes	Estimated Capital Cost	
Inflation		+$54M
Design Enhancements		+$15M
New and deeper wells	+$29M	
Gravity-fed recharge facilities	-$27M	
Various other changes	+$13M	
Off-site Power		+$11M
Water Quality (Arsenic Treatment)		Deferred
	Total	**$80M**

Committee Feedback

March 13, 2023 – One Water and Stewardship Meeting

- What are the impacts to Metropolitan's rates?
  - No measurable impacts to adopted budget
  - Overall long-term rates increase by 0.33 percent through bond financing
- What does the authorized budget of $131 million provide?
  - Discussed in alternatives considered

Alternatives Considered

Option 2

Defer authorization of additional $80 million

- Request that AVEK pauses all future construction activities
- Metropolitan will pause reimbursement of future costs to AVEK
  - Provides additional time to complete groundwater modeling and select robust treatment facility
  - Reduces uncertainty of full treatment costs
  - Delays commencement of design of off-site power facilities and certainty of costs
  - Delays start of project operation
  - Further inflation driving costs even higher

Alternatives Considered

Option 3

Stay within authorized budget

- Limit participation to stay within approved budget of $131 M (62%)
  - Storage capacity of 173,600 AF
  - Put/take capacity of 43,400 AFY
  - Cost does not include treatment; project share will decrease based on future treatment costs
- Need for additional 26,600 AF
  - In one year (2022) would have cost $30 million to acquire additional supply, if available

Remaining items

- Return to Board to request authorization to amend agreement
  - Extend term by 20 years plus 20-year option
  - Negotiate credits for surplus purchased land and upsized facilities
  - Address impacts to nearby wells
- Return to Board with proposed treatment and cost
  - Additional amendment to agreement

Summary

- Improves water supply reliability
  - Captures surplus SWP supplies in wet years and delivers supplies in dry years
  - Reduces dependence on Colorado River supplies in dry years
- Provides emergency reliability to SWP east branch dependent areas
- Provides greater operational flexibility to help meet demands
- Submitted strong Bucket 2 proposal to USBR
  - If awarded, will fund new elements (deeper wells, off-site power, future treatment)

How are costs recovered?

The operational function of the AVEK High Desert Water Bank within Metropolitan's system is supply

- AVEK's cost allocation is determined by the cost-of-service process
  - Facility costs are determined by operational function
  - AVEK's operational function for MWD's system is supply
  - AVEK costs are currently recovered through supply rate
  - For costs of service, it will be treated accordingly

Other similar programs serving a supply function include: Arvin-Edison Storage, Semitropic Storage, Kern Delta Storage, Mohave Storage, AVEK Storage, & AVEK High Desert Water Bank

Board Options

Option #1

- Review and consider Addenda Nos. 1, 2, and 3 to the Mitigated Negative Declaration previously adopted by the Antelope Valley-East Kern Water Agency for the High Desert Water Bank;
- Approve changes to the design, construction, and operation of the Water Bank facilities;
- Authorize up to $80 million for additional costs associated with these changes.

Option #2

- Review and consider Addenda Nos. 1, 2, and 3 to the Mitigated Negative Declaration previously adopted by the Antelope Valley-East Kern Water Agency for the High Desert Water Bank, and
  (1) defer approval of the changes to the Water Bank, and
  (2) defer authorization of additional funding until the treatment and off-site power costs are known.

Option #3

- Do not approve the changes to the design, construction, and operation of Water Bank facilities and do not authorize up to $80 million for additional costs associated with these changes.

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

One Water and Stewardship Committee

Update on Conservation Budget Expenditures

Item 6a

September 11, 2023

Conservation Expenditures & Commitments

FY22/23

Conservation Expenditures – FY2022/23 & FY2023/24 (1)

	Paid (2)	Committed (3)
Regional Devices	$6.5 M	$6.4 M
Member Agency Administered	$7.9 M	$4.8 M
Turf Replacement	$22.4 M	$38.4 M
Advertising	$6.9 M	$0.1 M
Other	$2.0 M	$1.1 M
TOTAL	$45.7 M	$50.8 M

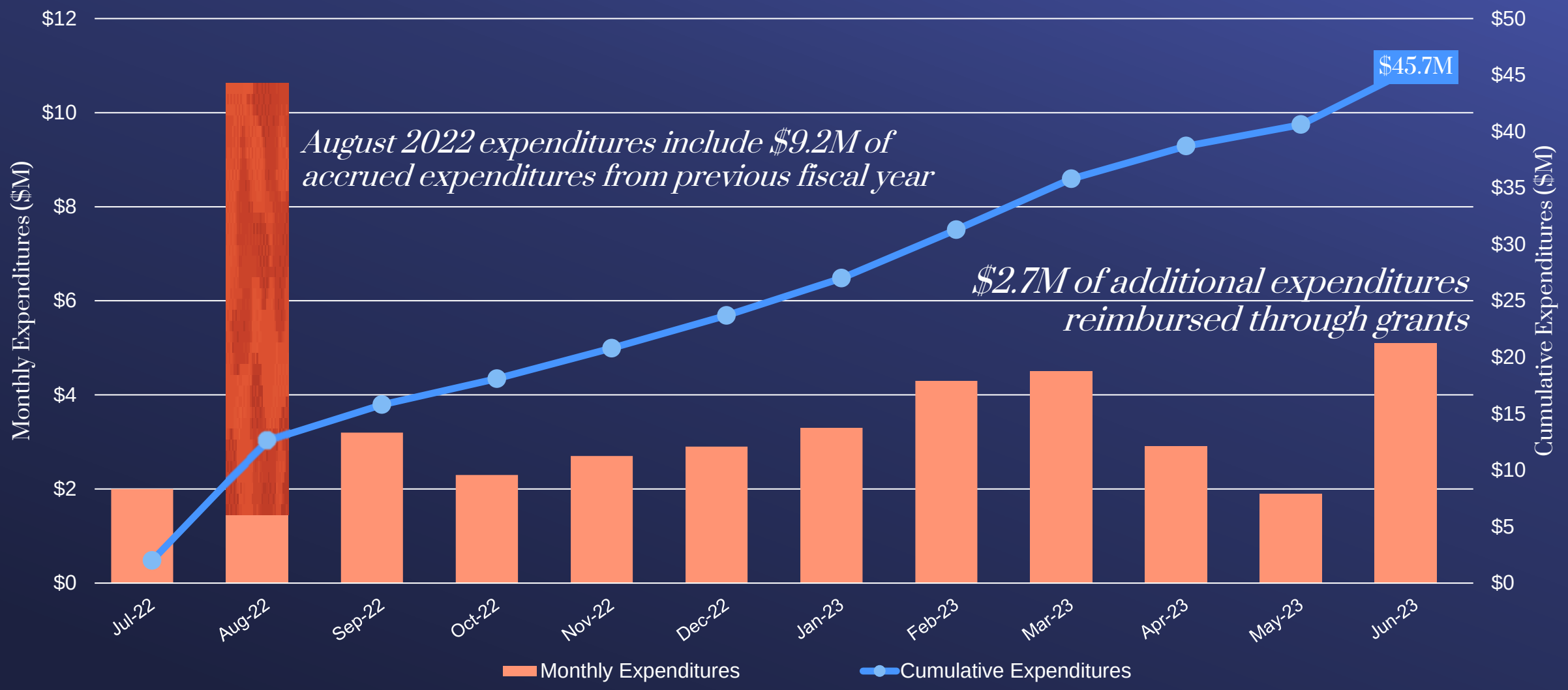
(1) The Conservation Program biennial expenditure authorization is $86 million.

(2) Paid as of 7/1/2022 - 6/30/2023. Financial reporting on cash basis.

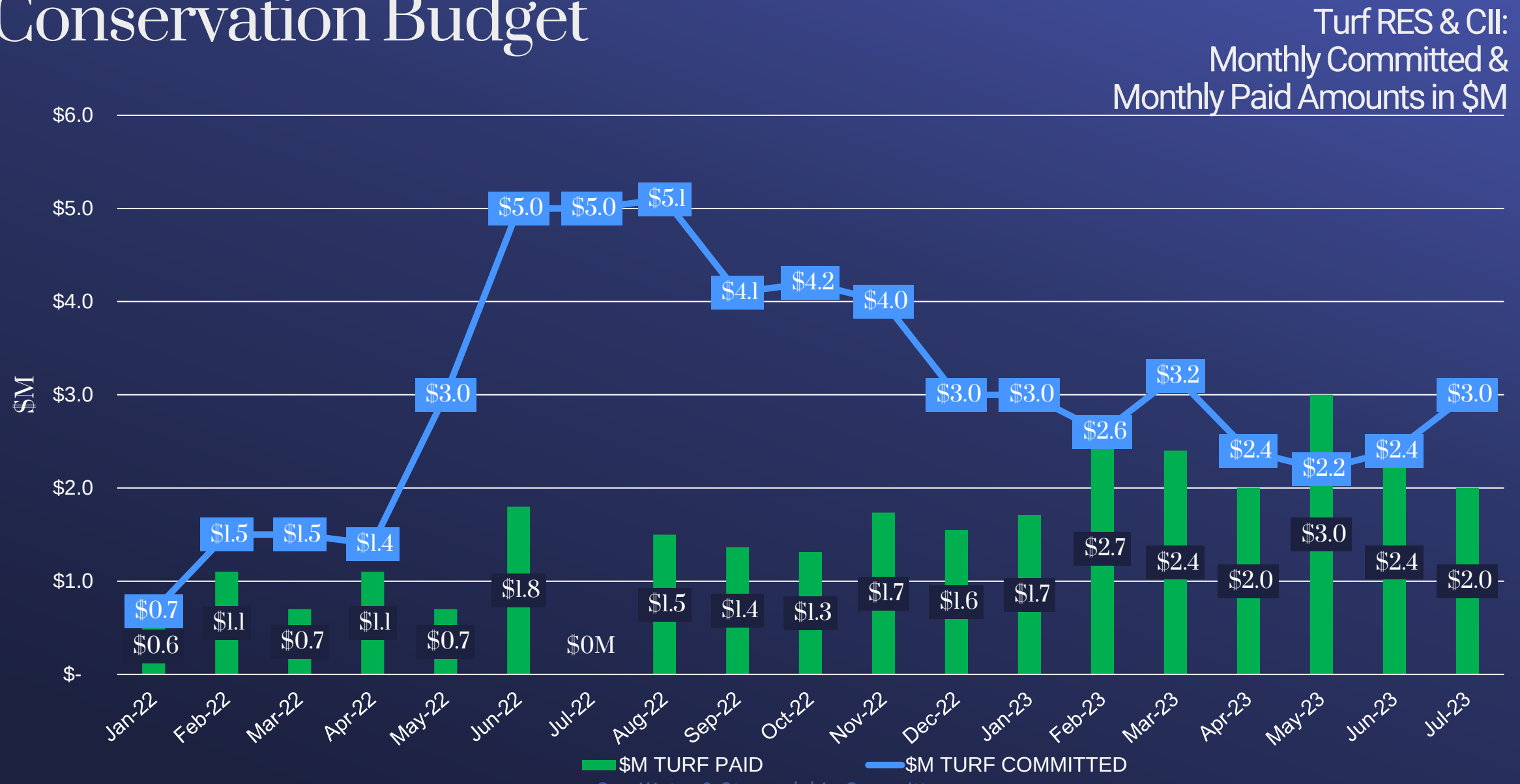
(3) Committed dollars as of July 10, 2023

Monthly & Cumulative Conservation Program Expenditures

FY 2022/23



Turf Replacement Activity is the Driver of the Conservation Budget

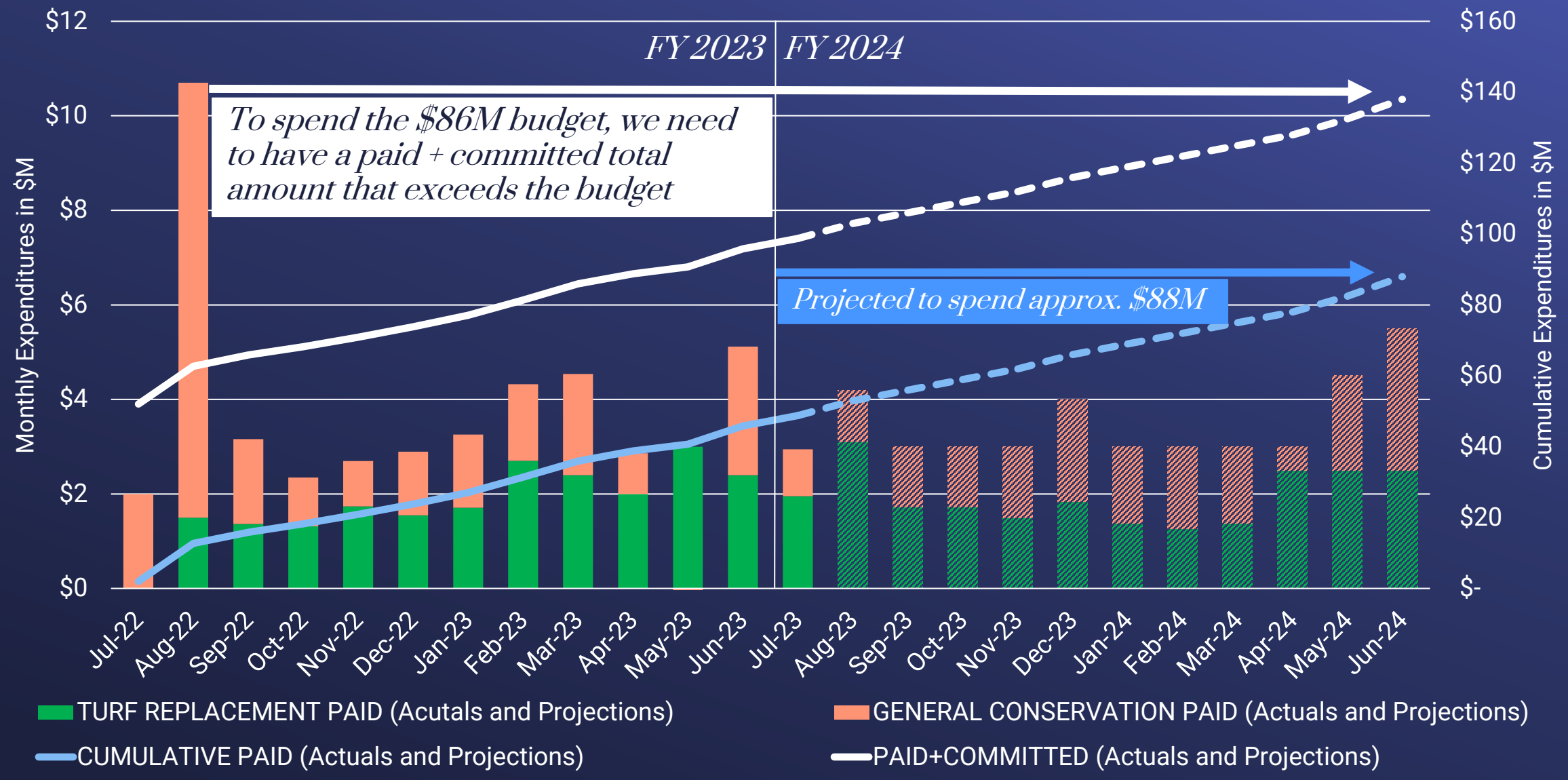


How We Estimate Turf Replacement Expenditures

Estimating Program Expenditures

- Both Residential & CII applicants require reservations
- Approximately 40% of applications drop out
  - Dropouts occur due to project costs & complexity
  - Extensive resources created to address knowledge gap
- Projects can take 6-12 months to complete
  - SWP-d area applicants were granted extensions during watering restrictions

Forecasting Expenditures to the End of FY23/24



Next Steps

What to Expect

- Continue monthly board updates
- Upcoming grants for turf replacement will accelerate commitments
  - $30M from DWR for commercial and public agency turf replacement
    - Most projects would be paid next budget cycle (FY24/25 & 25/26)

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

1928

One Water and Stewardship Committee

Future Supply Actions Funding Program Update

Item 6b

September 11, 2023

Overview

- Background
- Future Supply Actions Funding Program
- Proposed Future Rounds
- Next Steps

Background

Established in 2010 IRP

- Round 1 - 2013
- Round 2 -2018

Drive innovation

- Pilot new approaches
- Remove Barriers
- Regional Benefit

Local Resources

- Groundwater
- Stormwater
- Reuse
- Desalination

Foundational Action Funding Program

Round 1

- Approved in 2013
- Funded 13 studies
- $2.9 million invested
- Technical conference ~230 participants

Groundwater

- 4 studies
- 6 agencies
- $980,000

Recycling

- 5 studies
- 10 agencies
- $770,000

Desalination

- 2 studies
- 2 agencies
- $300,000

Storm Water

- 2 studies
- 2 agencies
- $810,000

FSA Funding Program

Round 2

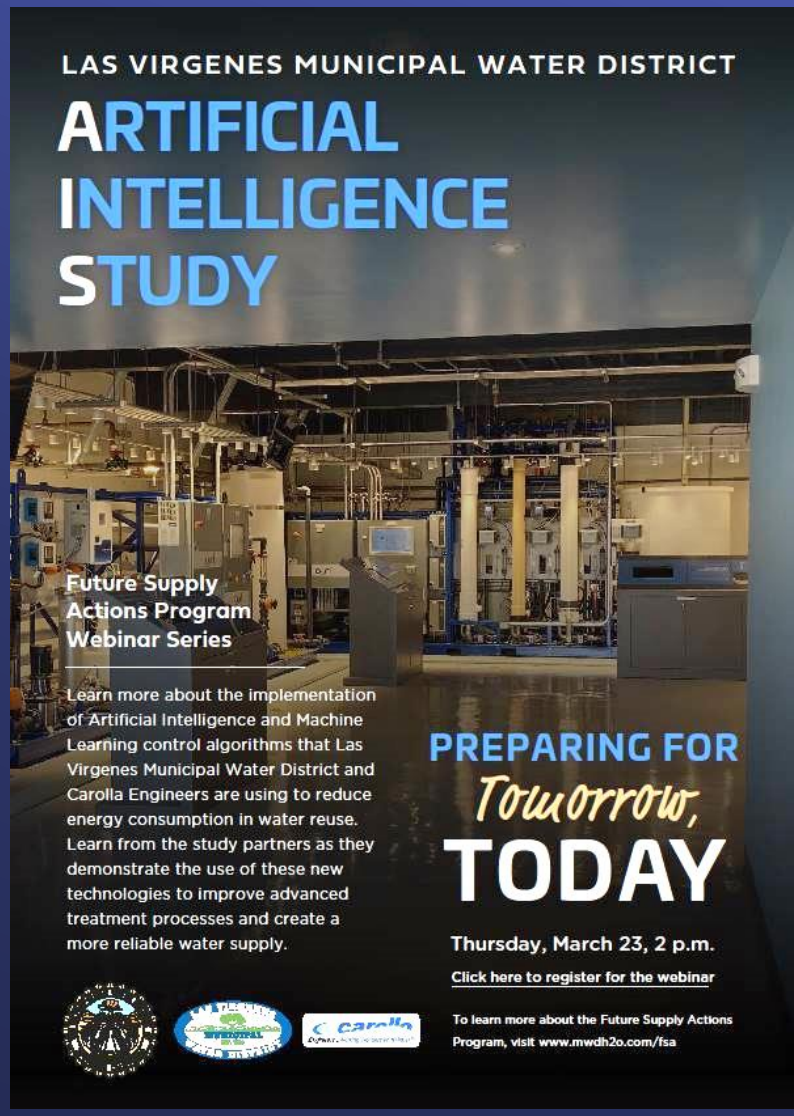
Member Agency

- 14 studies
- $3.1 million

Water Research Foundation

- 6 potable reuse studies
- 1 agricultural reuse study
- $975k

WRF – Webcast 9/26/2023



FSA Example Studies

www.mwdh2o.com/FSA

Groundwater

Calleguas MWD – Groundwater Utilization Pilot Study

Recycled Water

Las Virgenes MWD – Application of AI / Machine Learning to Advanced Water Treatment for IPR

Seawater Desalination

SDCWA – Wedgewire Screen Pilot study

Stormwater

MWDOC – Smart Watershed Network Pilot

FSA Core Program Elements

- Up to $500k per member agency or per study
- 100% dollar-for-dollar match
- 2-year studies
- Selected through RFP
- Studies must meet minimum criteria
- Selected by expert panel

Proposed Changes for Next Rounds

Goal: Align program implementation with available funding and staff resources

Example Frequency

2 Rounds of up to $3 Million → 2 Years Apart → 12+ Studies Total

- More frequent funding
- Funds a similar number of studies
- FSA budget of $3 million / two years

Proposed Administrative Changes

Agreement Streamlining

- No retention
- One year extension provision

Member Agency Partnerships

- 5% scoring benefit
- 3 or more MA partners required

Final Hybrid Symposium

MA Feedback

August MAM – 8/3/2023

- Agreement administration
- Partnership scoring bonus

MA Workshop - 8/23/2023

- 41 participants
- Opening agreements to sub-agencies
- Round 3 theme

Next Steps

- Incorporate Feedback
- October Board: Authorize Program
- Issue RFP: 6 weeks
- Expert Review and Study Selection
- 2024 Q1 Board: Fund Studies

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

One Water and Stewardship Committee

Update on Conservation

Item 6c

September 11, 2023

Current Conservation Program Expenditures

FYs 2022/23 & 2023/24 (1)

	Paid(2)	Committed(3)
Regional Devices	$6.8M	$5.7M
Member Agency Administered	$8.2M	$4.7M
Turf Replacement	$24.4M	$35.3M
Advertising	$6.9M	$3.6M
Other	$2.3M	$1.4M
TOTAL	**$48.6M**	**$50.7M**

(1) The Conservation Program biennial expenditure authorization is $86M.

(2) As of 7/1/2022 –7/31/2023. Financial reporting has changed from modified accrual to cash basis. This resulted in $9.2M of expenditures that were accrued last year but paid in cash this fiscal year.

(3) Committed dollars as of July 10, 2023.

Current Conservation Program Activity

FYs 2022/23 & 2023/24

Turf Replacement Rebates:

July: 980,968 ft2 removed

FY2022/23-FY2023/24: 11,452,413 ft^2 removed

Toilets:

July: 1,341 units rebated

FY2022/23-FY2023/24: 25,267 units rebated

Smart Controllers:

July: 1,063 units rebated

FY2022/23-FY2023/24: 10,682 units rebated

Lifetime Water Savings to be achieved by all rebates in July 2023: 5,790 AF

FY2022/23-FY2023/24: 68,186 AF lifetime water savings

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Report

Office of the General Manager

• Colorado River Management Report

Summary

This report provides a summary of activities related to management of Metropolitan's Colorado River resources for the month of August 2023.

Purpose

Informational

Detailed Report

Post-2026 Operational Guidelines Environmental Impact Statement Scoping Comments

The U.S. Bureau of Reclamation (Reclamation) initiated the Environmental Impact Statement (EIS) process to develop the Post-2026 Operational Guidelines that will be used to manage operations of the Colorado River System reservoirs after the current Guidelines expire in 2025. Since June, Reclamation has been receiving public comments on the Purpose and Need and scope of the EIS. These elements of the EIS will determine what can be considered in the Action Alternatives, which will determine the eventual final agency action.

Metropolitan submitted a Scoping Comment letter jointly with the Southern Nevada Water Authority and Central Arizona Water Conservation District (or CAP) stating support for the letters submitted by the Colorado River Basin States and Lower Division States, and also asked that the scope of the EIS and proposed federal action:

- Ensure sufficient water for public health, safety and welfare.
- Protect existing Intentionally Created Surplus (ICS).
- Provide for continued incentives to add conserved water to Lake Mead.
- Address the imbalance between supplies and demands in the Colorado River Basin.
- Include a framework that incentivizes voluntary conservation, augmentation, and exchange.

Many other Scoping Comment letters were submitted by Colorado River Basin States, irrigation districts, Tribes and NGOs. Reclamation will consider the comments received and prepare a scoping report, which will determine what elements will be considered for analysis in the EIS.

Metropolitan staff will continue to work with Colorado River Basin States, Colorado River contractors in California, Tribes and NGO partners throughout the process to develop Alternatives for the EIS.

Reclamation Issues August 24-Month Study

The August 24-Month Study projections of January 1 reservoir elevations are used to set the operating tiers and to project annual release volumes from Lake Powell to Lake Mead. The August 2023 24-Month study projects that on January 1, 2024, Lake Powell elevation to be less than 3,575 feet and at or above 3,525 feet and the Lake Mead elevation to be at or above 1,025 feet. These elevations mean that in water year (WY) 2024 Lake Powell will be operating in the Mid-Elevation Release Tier and the water year release volume from Lake Powell will be 7.48 million acre-feet. Additionally, the Lake Mead elevation is forecast to be below 1,075 feet and above 1,050 feet, triggering a Level 1 Shortage Condition in the Lower Basin and Drought Contingency Plan (DCP) contributions. This is an improvement over last year's determination, which was a Level 2 Lower Basin Shortage. California does not take shortages and does not owe any DCP contributions at the forecasted Lake Mead elevations.

Date of Report: 9/12/2023

Inflation Reduction Act (IRA) Drought Mitigation Funding Update

Reclamation sent a letter to Lower Basin Colorado River contract and entitlement holders requesting proposals for long-term durable system efficiency improvement projects that result in water conservation benefitting the lower Colorado River System and its water users. The deadline for responses was moved to August 18. This is the next phase of the Lower Colorado River Conservation Program (using "Bucket 2" IRA funds) intended to provide new opportunities to fund system conservation and efficiencies in the Lower Basin that lead to durable long-term solutions for the Colorado River System that results in additional volumes of water remaining in Lake Mead.

After receiving input from the Board and member agencies, Metropolitan submitted a confidential proposal to Reclamation that emphasized benefits for disadvantaged communities, including turf replacement programs, groundwater storage programs, and an increase in funding for Local Resources Projects. Reclamation received several proposals from agencies in Arizona, Nevada, and California and will be evaluating them and some of them may be revised before they are ultimately approved. Staff will keep the Board apprized as this proposal moves through the process.

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Report

Office of the General Manager

- **Bay-Delta Management Report**

Summary

This report provides a summary of activities related to the Bay-Delta for August 2023.

Purpose

Informational

Detailed Report

Long-Term Delta Actions

Sites Reservoir

At the joint Sites Project Authority Board and Sites Reservoir Committee Meeting on August 18 , the Reservoir Committee and Authority Board authorized the Executive Director to execute a cooperative agreement between the Sites Project Authority and Reclamation District No. 108 regarding the use of existing partner facilities and development and operation of new infrastructure. This collaborative agreement centers around the planned utilization of existing facilities including the Colusa Basin Drain south of the Balsdon Wier, Knights Landing ridge cut, Knights Landing outfall gates, and the Wallace Weir. The cooperative agreement outlines support and assistance on several activities including planning, design, permitting, construction of new infrastructure and facility improvements, and coordinating integration into existing facilities.

Near-Term Delta Actions

Science Update

In the month of August science staff reached a major milestone in the Reorienting to Recovery (R2R) Project Structured Decision Making process, finalizing “bookend” modeled scenarios to test combinations of management actions to recover salmonids in the Central Valley. These scenarios were generated to test distinct combinations of intense management actions focused around one action type (either flows, harvest, hatcheries, or habitat) and results presented to the structured decision making workgroup. Overall, no singular bookend met all biological salmonid recovery targets, however since each scenario represents implementing only one type of management action and was not designed to achieve recovery, these results were expected and indicate that there are multiple factors hindering recovery that will require multiple types of management actions. The workgroup brainstormed additional scenarios that balance salmonid recovery goals with other interests for the next round of modeling and the R2R Project team will refine and model these scenarios for additional discussion in Winter 2023.

Staff were also interviewed by the Delta Independent Science Board on modeling predation in the Bay-Delta Ecosystem and how modeling can be used to inform water management actions. Additionally, staff participated in planning of the 2024 Interagency Ecological Program Workshop which showcases a range of topics that will be used to inform the management of the Bay-Delta watershed.

Delta Island Activities

In preparation for the October Board action to amend the Capital Investment Plan to include the Webb Tract Mosaic Landscape Project and to award three agreements to begin design and environmental planning, staff is negotiating grant terms and conditions that will be included in the Board letter to inform the Board before the grant agreement is executed. If approved, grant execution is expected soon after the October Board action.

Date of Report: 9/12/2023

One Water and Stewardship Committee

Bay-Delta Manager's Report

Item 7b

September 11, 2023

Sites Reservoir Water Rights Application

- Protest period ended August 31st, 2023 with 15 total protests received
- Next steps: Sites is working with protestants to find resolution. Unresolved protests will go to hearing

State Water Contractors Protest

- Supportive of the proposed Sites Reservoir Project
- Existing SWP and future Delta Conveyance Project water rights could be impacted
- Protest process provides a forum for ensuring that the water rights of all parties are protected

Sites Reservoir Planning Updates

Bay-Delta Costs and Expenditures

Memo Transmitted on September 7th, 2023

- Follow-up to Board direction given during the Bay-Delta 101 Workshop held on July 25th, 2023
- Includes costs and expenditures related to:
  - Delta Conveyance Project
  - Sites Reservoir
  - Bay-Delta Science Activities
  - Metropolitan's Delta Islands

COEQWAL Grant

Equitable Stewardship of California's Water in a Changing Climate

- **Grant:** $8.2 million California Climate Action grant awarded to UC Berkeley
- **Deliverables**: flexible and accessible version of water operations model used by state & federal agencies for water planning in California
- **Overarching goal**: advance underlying science, identify needs for improving existing models and build a foundation for collaborative decision making to advance equitable, sustainable and climate-resilient water stewardship in California
- **Community partners**: Tribal communities, TNC, Restore the Delta, DSC, PPIC, State and Federal agencies, and others

Berkeley Rausser
College of Natural Resources

MWD Contribution: $150K matching funds and in-kind services

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

One Water & Stewardship Committee

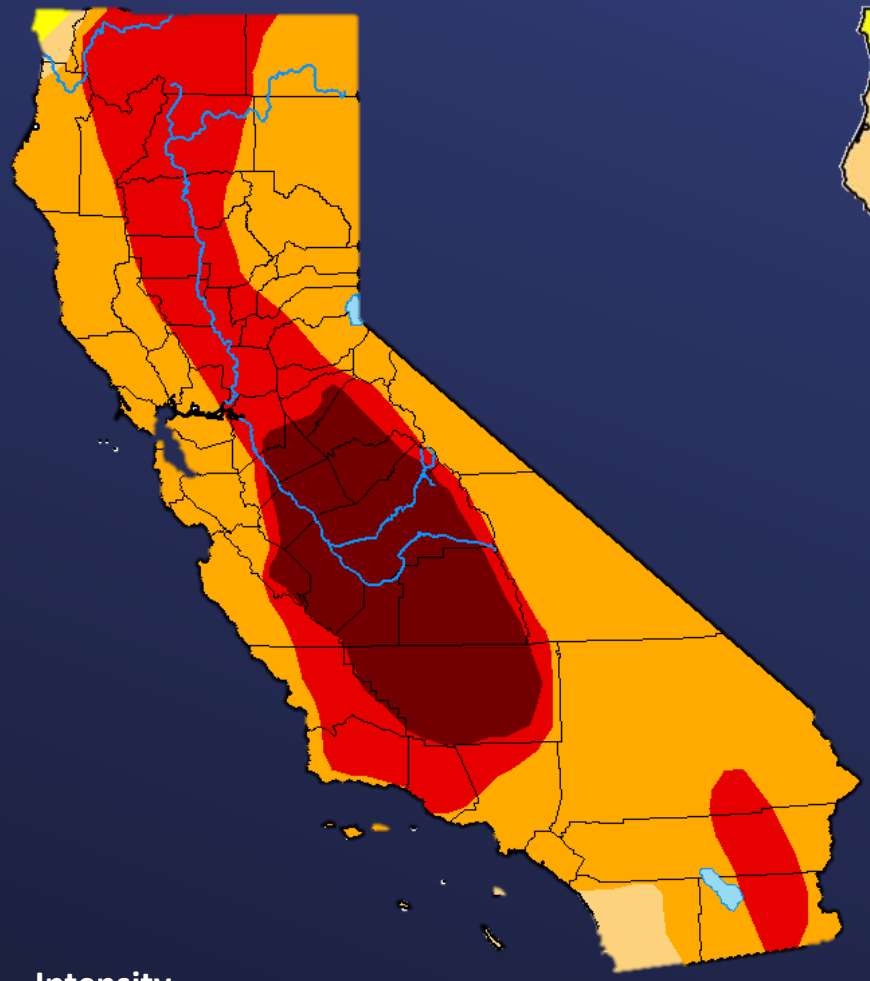
Water Resource Manager Update

Item 7c

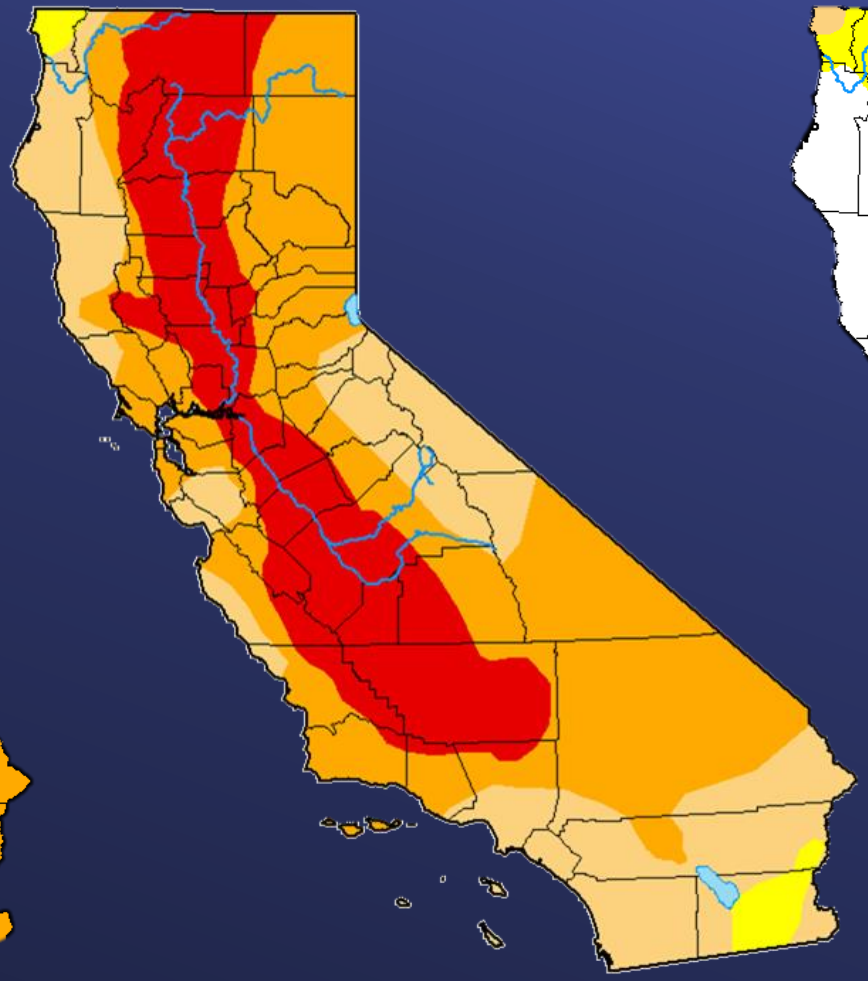
September 11, 2023

Changes to California's Drought Conditions

August 2022



January 2023

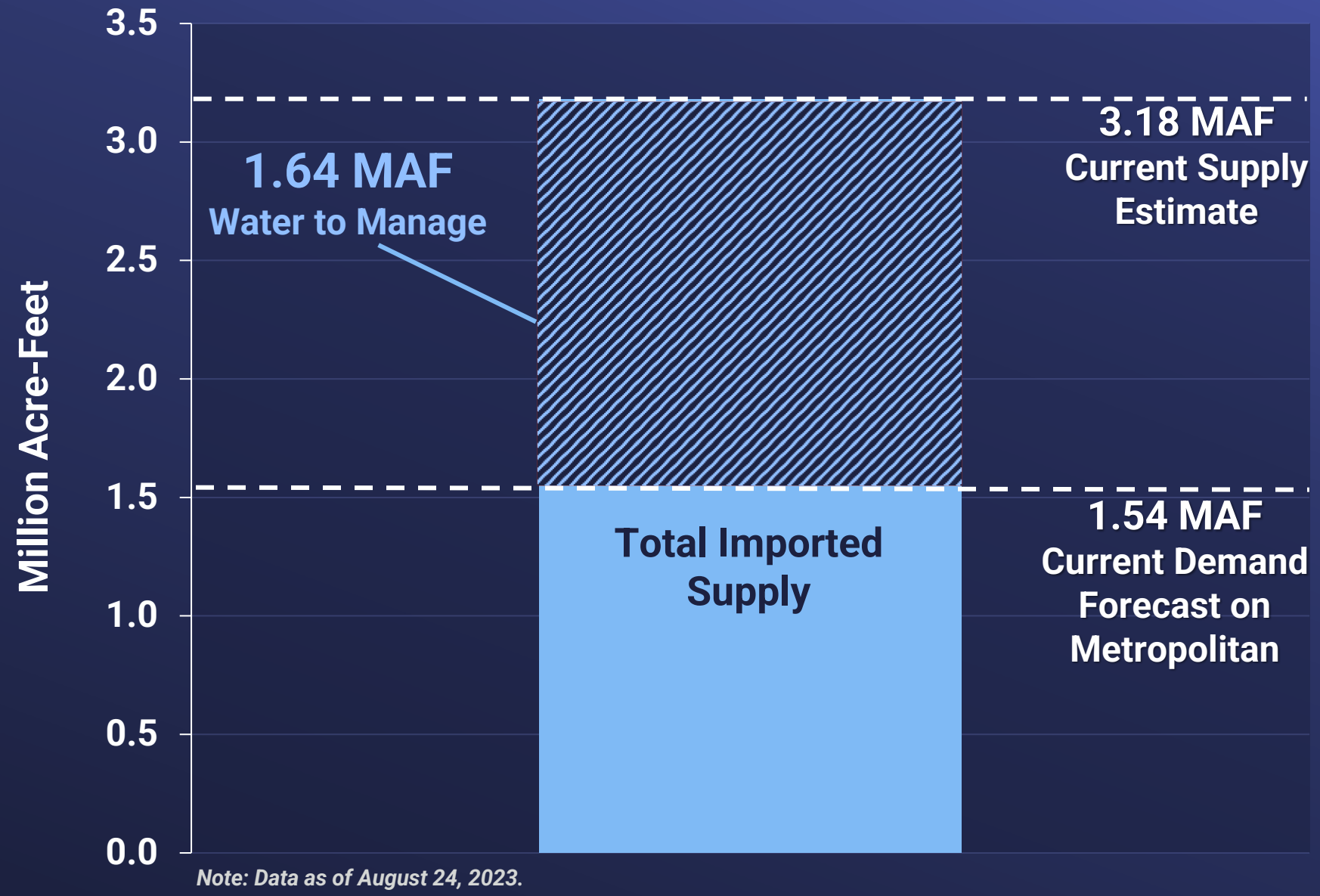


August 2023

Intensity

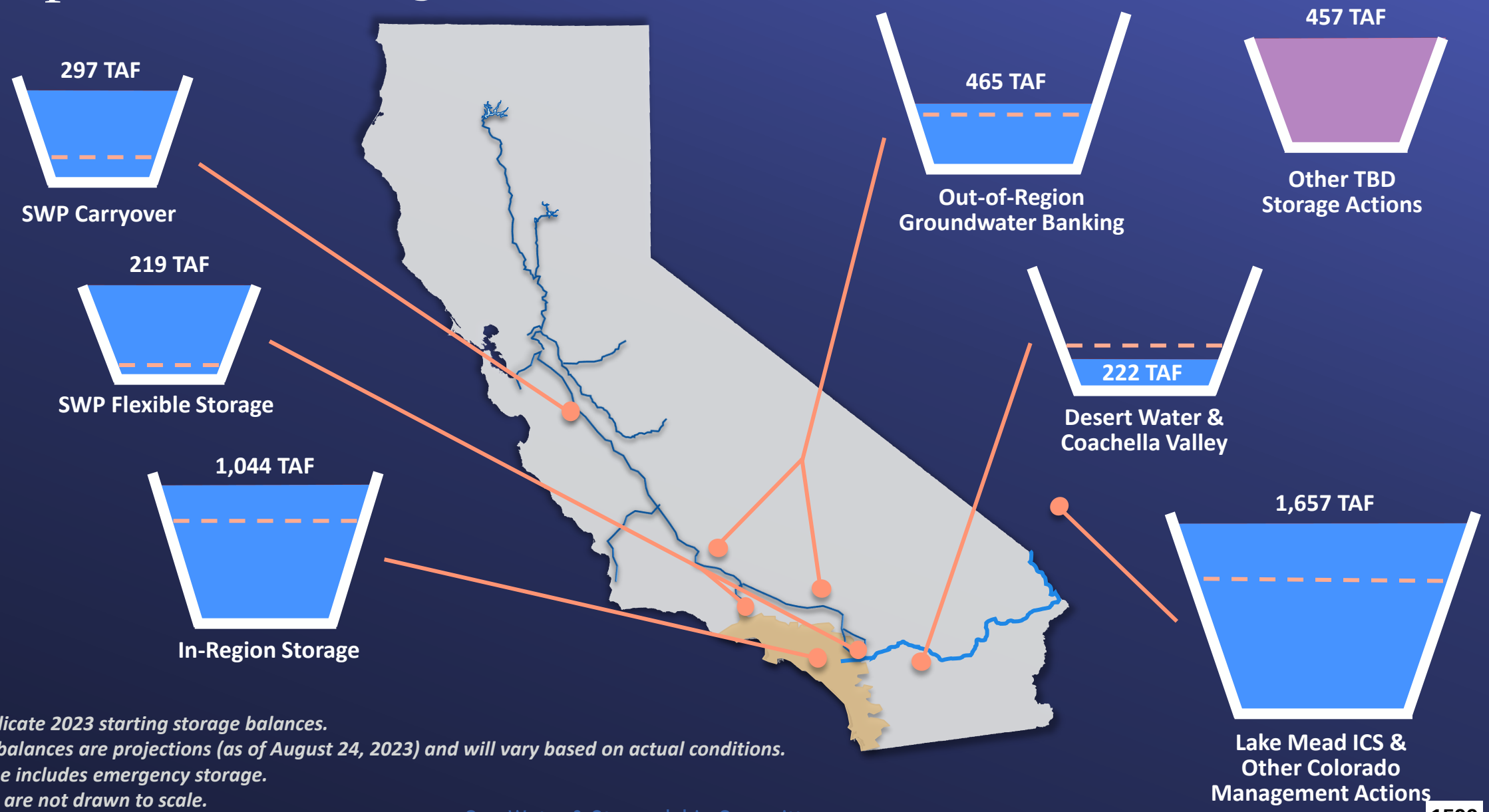
- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

2023 Water Supply/Demand Balance: Regional View



Note: Data as of August 24, 2023.

Metropolitan's Storage Actions



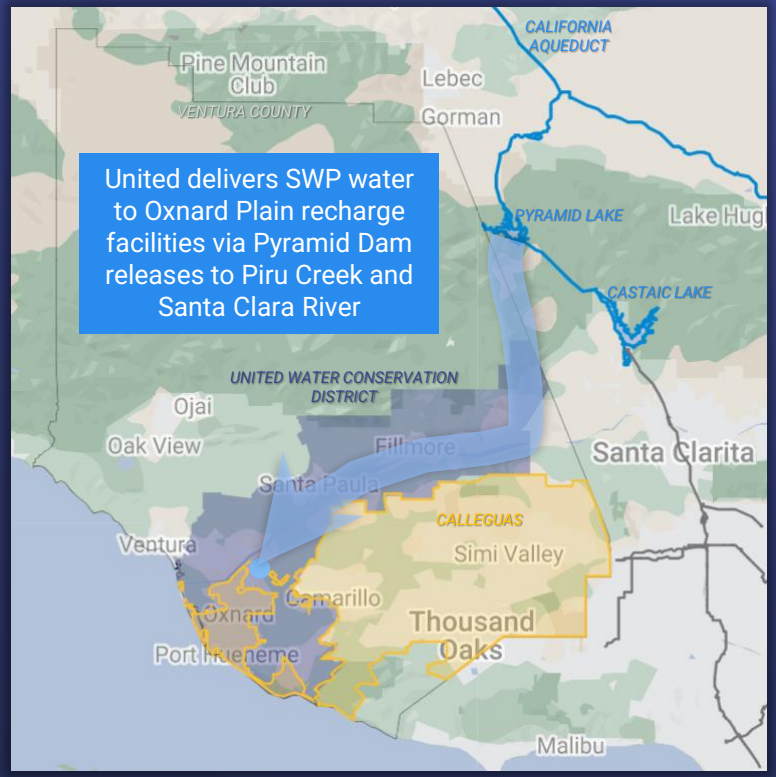
Notes:

1) *Dashed lines indicate 2023 starting storage balances.*
2) *Ending storage balances are projections (as of August 24, 2023) and will vary based on actual conditions.*
3) *In-region storage includes emergency storage.*
4) *Storage buckets are not drawn to scale.*

Limited Capacity to Deliver Exchange Water to Other SWP Contractors in 2023

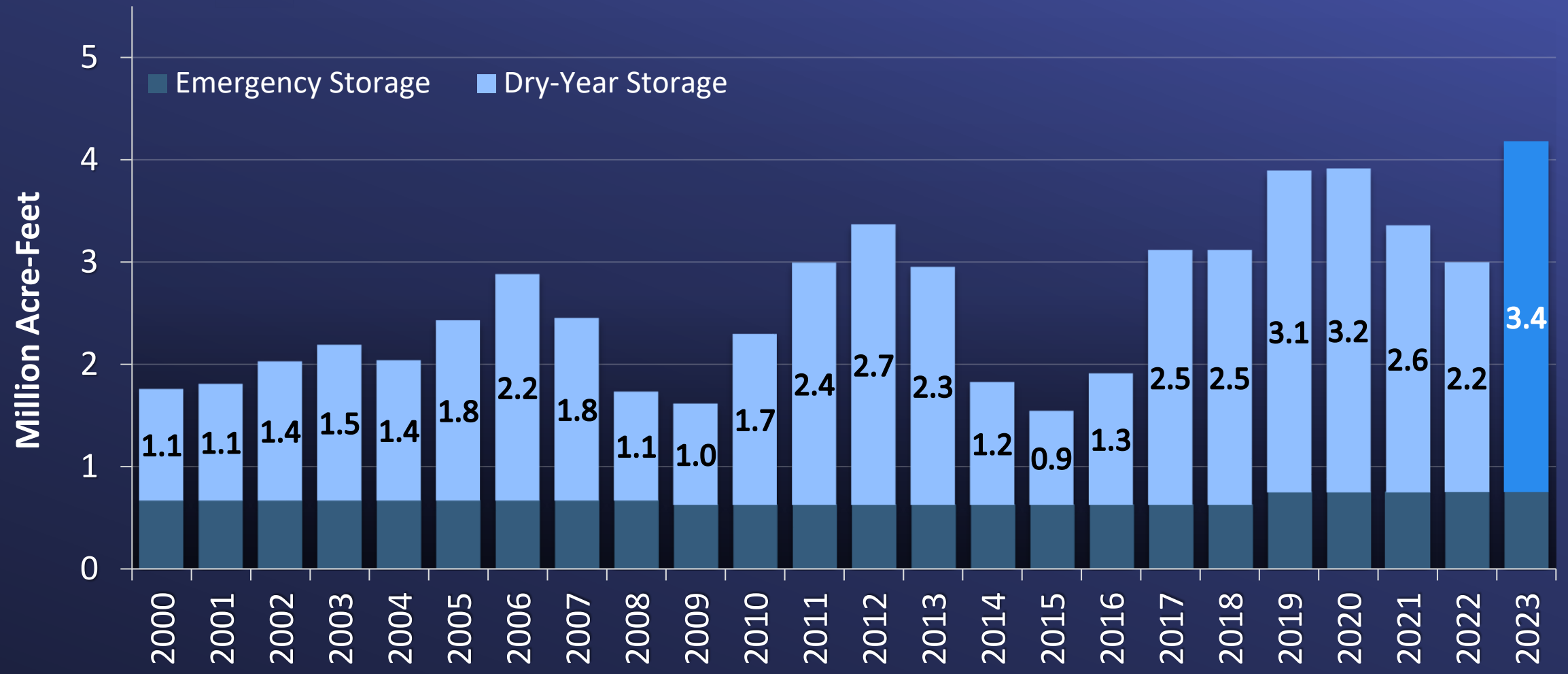
Managing Surplus Supply

- Other SWP contractors facing challenges managing abundant supply
- Diversion capacity for Oxnard Plain recharge full through end of year
- Metropolitan maximizing East Branch capacity



Record-High Storage Projection for Metropolitan

End-of-Year Balances



Note:

2023 end-of-year balance is preliminary as they are subject to DWR adjustments and USBR final accounting.

Groundwater Coordination

Member Agency Groundwater/Reservoir Management Workshops

- Purpose
  - Develop programs in partnership with member agencies to help manage surplus supplies
- New Concept Under Discussion
  - Metropolitan's willingness to pay for water management actions based on performance and regional benefit
- Targeting Board Approval in Jan./Feb. 2024

Metropolitan and Member Agencies sponsored, presented, and organized event

Water Data Summit

Sept. 7-8

Stanford University

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

1928

One Water and Stewardship Committee

Chief Sustainability, Resilience and Innovation Officer's Report

Item 7d

September 11, 2023

Climate Action Plan

ZEV Factory Tour

SUSTAINABILITY
RESILIENCE
INNOVATION

Zero Emission Vehicles
Partnerships with Vehicle Manufacturers

- SRI, WSO, and Regulatory employees visited the Phoenix Motors factory in Anaheim on August 23
- Phoenix produces zero emission vehicles and equipment including utility trucks and electric forklifts that provide Metropolitan with options for future purchases needed to comply with recently adopted CARB regulations

CAMP4W – Utility Panel

Climate Adaptation Master Plan for Water (CAMP4W)

SUSTAINABILITY
RESILIENCE
INNOVATION

Utility Panelists

- Central Arizona Project (CAP), Colorado River Programs Department
- Southern California Edison (SCE), Climate Adaptation & Resilience Planning
- Pacific Gas & Electric Company (PG&E), Climate Resilience

Discussions

- The use of climate science and data to inform evaluative criteria for near-term strategies and longer-term adaptive management

- Affordability challenges

- Measuring and considering the cost of inaction

Hinds Pumping Plant Pilot

Innovation Front

Pilots and Programs

SUSTAINABILITY
RESILIENCE
INNOVATION

Metropolitan's Engineering, Operations (WSO), Innovation (SRI), WaterStart, and Tech4 Teams have Pilot discussions on Arc Flash Safety and Asset Protection Technology at Hinds Pumping Plant championed by Michael Thomas.

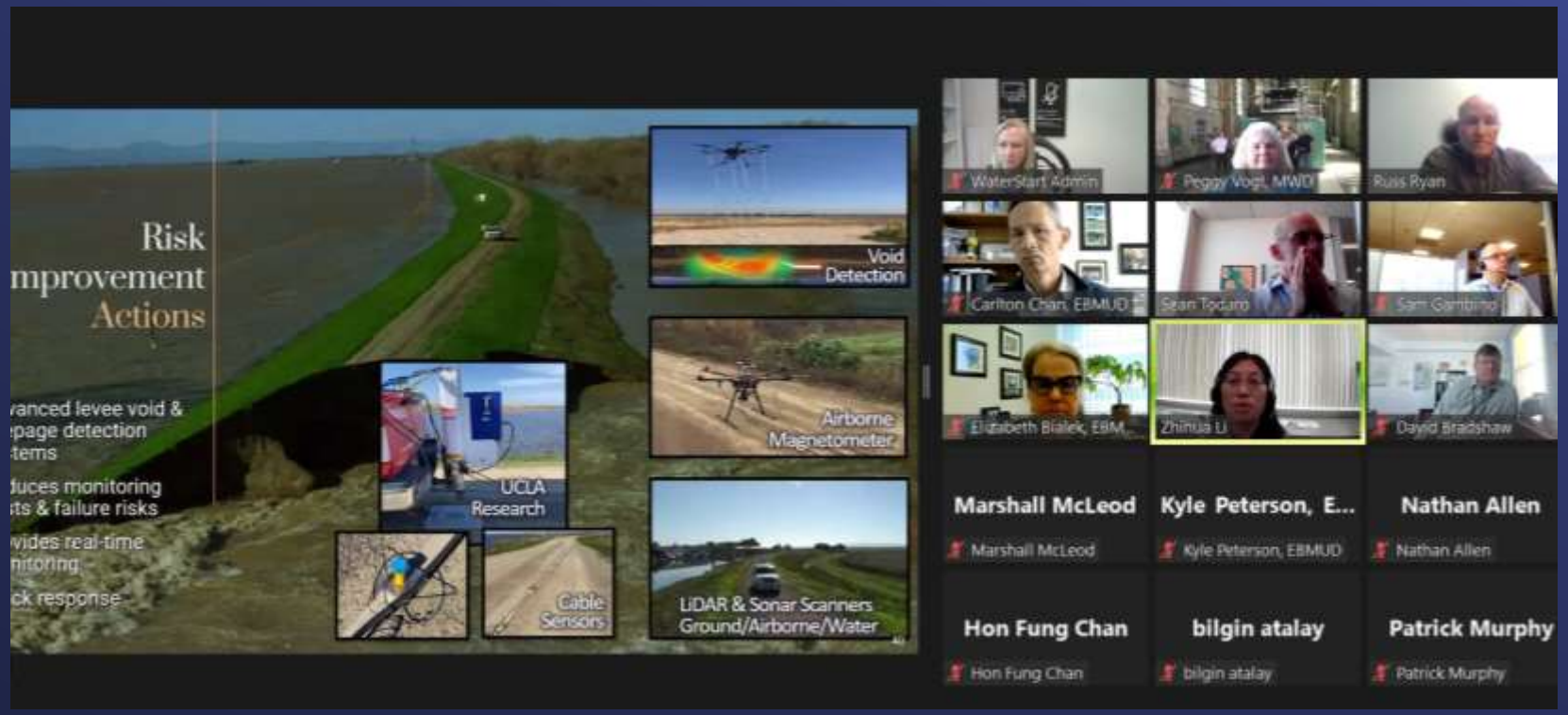
Peer 2 Peer Water Innovation

Innovation Front

Pilots and Programs

SUSTAINABILITY
RESILIENCE
INNOVATION

Metropolitan's Bay Delta, SRI Innovation, and WRM Innovation Teams met with WaterStart and EBay MUD to participate in a Peer 2 Peer Group to learn about pilots in the Bay Delta including satellite, levy monitoring, and lidar technologies. Information was shared and discussion revolved around a presentation from MWD's Russ Ryan on Bay Delta Innovations.



Carbon-Free Energy Development

SRI Land Management

SUSTAINABILITY RESILIENCE INNOVATION

- Statements of Interest on five properties
  - 12 Interested Parties
  - 25 Submittals
  - Submittals proposed solar, storage, and hydrogen
- Request for Proposal
  - Rio Mesa (PVID) 6,700 acres +/-
  - Lease at market rent to developer, negotiation includes right of first refusal, a virtual power purchase agreement with opportunity to procure green energy, secure RECs, and to offset GHG emissions

Sustainability Resilience & Innovation Office

SUSTAINABILITY
RESILIENCE
INNOVATION

The mission of the Sustainability, Resilience, and Innovation Office is to empower Metropolitan to deliver its core mission by inspiring and implementing solutions that benefit people, nature, and the climate.

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA