

Arvin-Edison Water Storage District

Expansion of District Distribution System Pipelines into Groundwater Service Area Lands Project

Draft Initial Study/ Mitigated Negative Declaration

April 2021



Prepared for:
Arvin-Edison Water Storage District

Prepared by:
Provost & Pritchard Consulting Group
286 W. Cromwell Ave. Fresno, California 93711



**COPYRIGHT 2021 by PROVOST & PRITCHARD CONSULTING GROUP
ALL RIGHTS RESERVED**

Provost & Pritchard Consulting Group expressly reserves its common law copyright and other applicable property rights to this document. This document is not to be reproduced, changed, or copied in any form or manner whatsoever, nor are they to be assigned to a third party without first obtaining the written permission and consent of Provost & Pritchard Consulting Group. In the event of unauthorized reuse of the information contained herein by a third party, the third party shall hold the firm of Provost & Pritchard Consulting Group harmless, and shall bear the cost of Provost & Pritchard Consulting Group's legal fees associated with defending and enforcing these rights.

Lead Agency:

Arvin-Edison Water Storage District

20401 E. Bear Mountain Boulevard
Arvin, CA 93203

Report Prepared for:

Arvin-Edison Water Storage District

20401 E. Bear Mountain Boulevard
Arvin, CA 93203

Contact:

Jeevan Muhar

Report Prepared by:

Provost & Pritchard Consulting Group

Briza Sholars, Senior Planner, Project Manager, QA/QC
Amy Wilson, Assistant Planner
Mark Thompson, GIS
Jackie Lancaster, Administrative Support

Contact:

Briza Sholars
(559) 449-2700

Table of Contents

Chapter 1	Introduction.....	1-1
1.1	Regulatory Information.....	1-1
1.2	Document Format	1-1
Chapter 2	Project Description.....	2-1
2.1	Project Background and Objectives.....	2-1
2.1.1	Project Title.....	2-1
2.1.2	Lead Agency Name and Address.....	2-1
2.1.3	Contact Person and Phone Number.....	2-1
2.1.4	Project Location	2-1
2.1.5	Latitude and Longitude	2-3
2.1.6	General Plan Designation.....	2-3
2.1.7	Zoning.....	2-4
2.1.8	Description of Project	2-4
2.1.9	Surrounding Land Uses and Setting.....	2-5
2.1.10	Other Public Agencies Whose Approval May Be Required.....	2-5
2.1.11	Consultation with California Native American Tribes.....	2-6
2.2	Environmental Factors Potentially Affected	2-10
Chapter 3	Impact Analysis	3-1
3.1	Aesthetics.....	3-1
3.1.1	Environmental Setting.....	3-1
3.1.2	Impact Assessment	3-1
3.2	Agriculture and Forestry Resources	3-3
3.2.1	Environmental Setting.....	3-3
3.2.2	Impact Assessment	3-3
3.3	Air Quality.....	3-8
3.3.1	Environmental Setting.....	3-8
3.3.2	Methodology of Determining the Significance of Air Quality Impacts	3-11
3.3.3	Screening Thresholds for Determining Impacts to Sensitive Receptors	3-12
3.3.4	Impact Assessment	3-13
3.4	Biological Resources	3-16
3.4.1	Environmental Setting.....	3-16
3.4.2	Impact Assessment	3-18

Expansion of District Distribution System Pipelines into Groundwater Service Area Lands Project

3.5	Cultural Resources	3-27
3.5.1	Environmental Setting.....	3-27
3.5.2	Methodology	3-27
3.5.3	Impact Assessment	3-28
3.6	Energy	3-30
3.6.1	Environmental Setting.....	3-30
3.6.2	Impact Assessment	3-30
3.7	Geology and Soils.....	3-31
3.7.1	Environmental Setting.....	3-31
3.7.2	Impact Assessment	3-34
3.8	Greenhouse Gas Emissions	3-36
3.8.1	Environmental Setting.....	3-36
3.8.2	Methodology	3-37
3.8.3	Impact Assessment	3-38
3.9	Hazards and Hazardous Materials	3-41
3.9.1	Environmental Setting.....	3-41
3.9.2	Impact Assessment	3-42
3.10	Hydrology and Water Quality	3-44
3.10.1	Environmental Setting.....	3-44
3.10.2	Impact Assessment	3-45
3.11	Land Use and Planning	3-48
3.11.1	Environmental Setting.....	3-48
3.11.2	Impact Assessment	3-48
3.12	Mineral Resources	3-51
3.12.1	Environmental Setting.....	3-51
3.12.2	Impact Assessment	3-51
3.13	Noise	3-53
3.13.1	Environmental Setting.....	3-53
3.13.2	Impact Assessment	3-53
3.14	Population and Housing	3-55
3.14.1	Environmental Setting.....	3-55
3.14.2	Impact Assessment	3-55
3.15	Public Services	3-56
3.15.1	Environmental Setting.....	3-56

Expansion of District Distribution System Pipelines into Groundwater Service Area Lands Project

3.15.2	Impact Assessment	3-57
3.16	Recreation	3-58
3.16.1	Environmental Setting.....	3-58
3.16.2	Impact Assessment	3-58
3.17	Transportation	3-59
3.17.1	Environmental Setting.....	3-59
3.17.2	Impact Assessment	3-59
3.18	Tribal Cultural Resources.....	3-61
3.18.1	Environmental Setting.....	3-61
3.18.2	Impact Assessment	3-61
3.19	Utilities and Service Systems	3-63
3.19.1	Environmental Setting.....	3-63
3.19.2	Impact Assessment	3-63
3.20	Wildfire	3-65
3.20.1	Environmental Setting.....	3-65
3.20.2	Impact Assessment	3-65
3.21	CEQA Mandatory Findings of Significance	3-67
3.21.1	Impact Assessment	3-67
Chapter 4	Mitigation Monitoring and Reporting Program.....	4-1
Chapter 5	References	5-1
Chapter 6	List of Preparers.....	6-1
Appendix A.....		A-1
CalEEMod Output Files		A-1
Appendix B.....		B-1
Biological Resources Assessment		B-1
Appendix C.....		C-1
Cultural Phase 1 Survey Report.....		C-1

List of Figures

Figure 2-1. Regional Vicinity Map	2-7
Figure 2-2. Topographic Quadrangle Map	2-8
Figure 2-3. Area of Potential Effect with AEWSO Boundary	2-9
Figure 3-1. Farmland Designation Map	3-6
Figure 3-2. Williamson Act Parcel Map	3-7
Figure 3-3. Photo 1	3-23
Figure 3-4. Photo 2	3-24
Figure 3-5. Photo 3	3-25
Figure 3-6. Photo 4	3-26
Figure 3-7. FEMA Flood Map	3-47
Figure 3-8. Kern County General Plan Land Use Designation Map	3-49
Figure 3-9. Kern County Zoning Map	3-50

List of Tables

Table 3-1. Aesthetics Impacts	3-1
Table 3-2. Agriculture and Forestry Resources Impacts	3-3
Table 3-3. Air Quality Impacts	3-8
Table 3-4. Summary of Ambient Air Quality Standards and Attainment Designation	3-10
Table 3-5. Short-Term - Construction-Generated Emissions of Criteria Air Pollutants	3-12
Table 3-6. Unmitigated Long-Term Operational Emissions	3-12
Table 3-7. Maximum Daily Air Pollutant Emissions During Construction	3-13
Table 3-8. Maximum Daily Air Pollutant Emissions During Operation	3-13
Table 3-7. Biological Resources Impacts	3-16
Table 3-8. List of Special Status Animal Species with Potential to Occur within the Project Site	3-17
Table 3-10. Cultural Resources Impacts	3-27
Table 3-11. Energy Impacts	3-30
Table 3-12. Geology and Soils Impacts	3-31
Table 3-14. Soils of the Project area	3-32
Table 3-14. Greenhouse Gas Emissions Impacts	3-36
Table 3-15. Short-Term Construction-Generated GHG Emissions	3-39
Table 3-16. Long-Term Operational GHG Emissions	3-39

Expansion of District Distribution System Pipelines into Groundwater Service Area Lands Project

Table 3-17. Hazards and Hazardous Materials Impacts	3-41
Table 3-18. Hydrology and Water Quality Impacts	3-44
Table 3-19. Land Use and Planning Impacts	3-48
Table 3-20. Mineral Resources Impacts	3-51
Table 3-21. Noise Impacts	3-53
Table 3-22. Population and Housing Impacts	3-55
Table 3-23. Public Services Impacts	3-56
Table 3-24. Recreation Impacts.....	3-58
Table 3-25. Transportation/Traffic Impacts.....	3-59
Table 3-26. Tribal Cultural Resources Impacts.....	3-61
Table 3-27. Utilities and Service Systems Impacts	3-63
Table 3-28. Wildfire Impacts	3-65
Table 3-29. Mandatory Findings of Significance Impacts.....	3-67
Table 4-1. Mitigation Monitoring and Reporting Program.....	4-2

Acronyms and Abbreviations

AB	Assembly Bill
AEWSD	Arvin-Edison Water Storage District
APCD	Air Pollution Control District
APE	Area of Potential Effect
APN	Assessor's Parcel Number
AQP	Air Quality Plan
ASM	ASM Affiliates, Inc
BRA	Biological Resource Assessment
BSA	Biological Survey Area
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
Cal/OSHA	California Division of Occupational Safety and Health
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CAAQS	California Ambient Air Quality Standards
CCAA	California Clean Air Act
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CH ₄	Methane
CHRIS	California Historical Resources Information System
CNDDB	California Department of Fish and Wildlife Natural Diversity Database
CO	Carbon Monoxide
CO ₂ e	Carbon Dioxide Equivalent
CRHR	California Register of Historical Resources
DEIR	Draft Environmental Impact Report
District	Arvin-Edison Water Storage District
DTSC	Department of Toxic Substance Control
DWR	Department of Water Resources
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency

Expansion of District Distribution System Pipelines into Groundwater Service Area Lands Project

FMMP.....	Farmland Mapping and Monitoring Program
GAMAQI.....	Guidelines for Assessing and Mitigating Air Quality Impacts
GC	Government Code
GHG.....	Greenhouse Gas
GIS	Geographic Information System
GWSA.....	Groundwater Service Area
IS	Initial Study
IS/MND.....	Initial Study/Mitigated Negative Declaration
MMRP	Mitigation Monitoring & Reporting Program
MND.....	Mitigated Negative Declaration
MT CO ₂ e.....	Metric Tons of Carbon Dioxide Equivalent
NAAQS.....	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
ND	Negative Declaration
NHPA.....	National Historic Preservation Act
NO ₂	Nitrogen Dioxide
NOX.....	Nitrogen Oxide
NPDES.....	National Pollutant Discharge Elimination System
NRCS.....	Natural Resources Conservation Service
NRHP.....	National Register of Historic Places
O ₃	Ozone
Pb	Lead
PG&E.....	Pacific Gas & Electric
PM _{2.5}	Particulate Matter less than 2.5 microns in diameter
PM ₁₀	Particulate Matter less than 10 microns in diameter
Project.....	Groundwater Service Area Project
ROG.....	Reactive Organic Gases
SCH	State Clearinghouse
SJVAB.....	San Joaquin Valley Air Basin
SJVAPCD.....	San Joaquin Valley Air Pollution Control District
SJVIC.....	Southern San Joaquin Valley Information Center
SO ₂	Sulfur Dioxide
SWPPP.....	Storm Water Pollution Prevention Plan
SWRCB.....	State Water Resources Control Board

Expansion of District Distribution System Pipelines into Groundwater Service Area Lands Project

SWSA	Surface Water Service Area
TAC	Toxic Air Contaminants
USACE	U.S. Army Corp of Engineers
USDA	U. S. Department of Agriculture
USGS	U. S. Geological Survey

Chapter 1 Introduction

Provost & Pritchard Consulting Group (Provost & Pritchard) has prepared this Initial Study/Mitigated Negative Declaration (IS/MND) on behalf of Arvin-Edison Water Storage District (AEWSD or District) to address the environmental effects of the Expansion of District Distribution System Pipelines into Groundwater Service Area Lands Project (Project or proposed Project). This document has been prepared in accordance with the California Environmental Quality Act (CEQA), Public Resources Code Section 21000 *et seq.* The District is the CEQA lead agency for this proposed Project.

The site and the proposed Project are described in detail in the **Chapter 2 Project Description**.

1.1 Regulatory Information

An Initial Study (IS) is a document prepared by a lead agency to determine whether a project may have a significant effect on the environment. In accordance with California Code of Regulations Title 14 (Chapter 3, Section 15000, *et seq.*)-- also known as the CEQA Guidelines-- Section 15064 (a)(1) states that an environmental impact report (EIR) must be prepared if there is substantial evidence in light of the whole record that the proposed Project under review may have a significant effect on the environment and should be further analyzed to determine mitigation measures or project alternatives that might avoid or reduce project impacts to less than significant levels. A negative declaration (ND) may be prepared instead if the lead agency finds that there is no substantial evidence in light of the whole record that the project may have a significant effect on the environment. An ND is a written statement describing the reasons why a proposed Project, not otherwise exempt from CEQA, would not have a significant effect on the environment and, therefore, why it would not require the preparation of an EIR (CEQA Guidelines Section 15371). According to CEQA Guidelines Section 15070, a ND or *mitigated* ND shall be prepared for a project subject to CEQA when either:

- a. The IS shows there is no substantial evidence, in light of the whole record before the agency, that the proposed Project may have a significant effect on the environment, or
- b. The IS identified potentially significant effects, but:
 1. Revisions in the project plans or proposals made by or agreed to by the applicant before the proposed MND and IS is released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur is prepared, and
 2. There is no substantial evidence, in light of the whole record before the agency, that the proposed Project *as revised* may have a significant effect on the environment.

1.2 Document Format

This IS/MND contains six chapters and four appendices. **Chapter 1 Introduction**, provides an overview of the proposed Project and the CEQA process. **Chapter 2 Project Description**, provides a detailed description of proposed Project components and objectives. **Chapter 3 Impact Analysis**, presents the CEQA checklist and environmental analysis for all impact areas, mandatory findings of significance, and feasible mitigation measures. If the proposed Project does not have the potential to significantly impact a given issue area, the relevant section provides a brief discussion of the reasons why no impacts are expected. If the proposed Project could have a potentially significant impact on a resource, the issue area discussion provides a description of potential impacts, and appropriate mitigation measures and/or permit requirements that would reduce those impacts to a less than significant level. **Chapter 4 Mitigation Monitoring and Reporting Program** (MMRP),

provides the proposed mitigation measures, implementation timelines, and the entity/agency responsible for ensuring implementation., **Chapter 5 References** and **Chapter 6 List of Preparers**.

The CalEEMod Output Files, Biological Resources Assessment , Cultural Phase 1 Survey Report, and NRCS Soil Resource Report are provided as technical **Appendix A**, **Appendix B**, and **Appendix C**, respectively, at the end of this document.

The analyses of environmental impacts in **Chapter 3** are separated into the following categories:

Potentially Significant Impact. This category is applicable if there is substantial evidence that an effect may be significant, and no feasible mitigation measures can be identified to reduce impacts to a less than significant level. If there are one or more “Potentially Significant Impact” entries when the determination is made, an EIR is required.

Less than Significant with Mitigation Incorporated. This category applies where the incorporation of mitigation measures would reduce an effect from a “Potentially Significant Impact” to a “Less than Significant Impact.” The lead agency must describe the mitigation measure(s), and briefly explain how they would reduce the effect to a less than significant level (mitigation measures from earlier analyses may be cross-referenced).

Less than Significant Impact. This category is identified when the proposed Project would result in impacts below the threshold of significance, and no mitigation measures are required.

No Impact. This category applies when a project would not create an impact in the specific environmental issue area. “No Impact” answers do not require a detailed explanation if they are adequately supported by the information sources cited by the lead agency, which show that the impact does not apply to the specific project (e.g. the project falls outside a fault rupture zone). A “No Impact” answer should be explained where it is based on project-specific factors as well as general standards (e.g. the project would not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

Chapter 2 Project Description

2.1 Project Background and Objectives

2.1.1 Project Title

Arvin-Edison Water Storage District Expansion of District Distribution System Pipelines into Groundwater Service Area Lands Project

2.1.2 Lead Agency Name and Address

Arvin-Edison Water Storage District
20401 E Bear Mountain Boulevard
Arvin, CA 93203

2.1.3 Contact Person and Phone Number

Lead Agency Contact
Jeevan Muhar, Engineer-Manager
(661) 854-5573
jmuhar@aebsd.org

CEQA Consultant
Provost & Pritchard Consulting Group
Briza Sholars, Environmental Project Manager
(559) 449-2700

2.1.4 Project Location

The Project area is located in central Kern County, California, southeast of the City of Bakersfield. The Project consists of up to 44 miles of non-contiguous pipeline work scattered within the Arvin Edison Water Storage District. The various portions of pipeline work are located east of Lamont, east of and within Arvin, and north of Mettler (see **Figure 2-3**). The Project area is located within various portions of five different United States Geological Survey (USGS) 7.5 minute quadrangles, Lamont, Edison, Weed Patch, Arvin and Mettler. It is in multiple sections of Township 30 South, Range 29 East, Township 31 South, Range 29 East; Township 31 South, Range 30 East; Township 32 South, Range 29 East; and Township 32 South, Range 28 East; M. D. B & M.

The Project area is located within the AEWSD, and is generally west of General Beale Road, south of Muller Road, east of Adobe Road and north of Teale Road. The pipelines are located on or adjacent to the following APNs:

446-022-17	189-170-07	503-100-06	178-170-28
446-022-19	446-010-36	189-020-12	178-201-42
446-023-23	446-010-41	189-020-14	178-201-48
446-023-28	178-230-12	189-020-30	178-230-13
446-023-30	189-030-32	189-352-04	446-043-32
446-023-31	503-042-05	189-352-31	178-350-25

Chapter Two: Project Description

Expansion of District Distribution System Pipelines into Groundwater Service Area Lands Project

189-753-07	446-010-59	446-120-01	189-030-01
189-190-09	446-010-60	446-120-02	189-030-03
178-281-04	446-010-73	446-120-14	189-030-05
189-130-22	193-120-02	446-120-15	178-350-17
189-140-05	178-282-23	446-120-27	178-202-05
178-010-20	189-753-02	178-281-05	189-753-06
178-010-21	189-340-22	189-150-07	177-260-05
178-370-02	446-022-13	193-120-04	445-042-15
178-370-03	445-041-27	446-010-04	189-120-19
178-410-02	445-042-18	178-020-03	189-020-21
178-201-35	446-041-31	178-230-21	189-020-21
178-230-09	446-041-32	178-202-22	189-020-22
178-230-07	446-042-15	446-043-08	189-020-22
503-060-41	177-250-02	446-043-10	193-150-26
445-042-41	177-280-10	189-020-31	193-150-26
503-060-02	177-280-11	189-150-05	503-042-10
189-351-90	177-280-12	189-150-11	503-080-01
189-351-94	177-280-19	189-340-50	503-080-02
189-340-24	177-280-30	189-340-49	503-080-04
189-340-27	178-260-09	189-340-45	503-080-05
189-351-93	178-281-23	189-340-46	446-042-04
503-100-07	178-282-24	503-042-09	446-042-06
189-400-09	189-020-16	503-042-30	188-390-03
446-043-06	178-220-02	178-050-13	189-030-73
503-060-10	178-220-03	178-410-03	189-020-17
189-190-10	178-220-23	189-352-09	178-230-30
189-390-01	178-220-01	189-352-11	178-281-29
189-390-02	446-023-01	189-050-01	189-050-69
189-390-03	446-023-03	189-050-21	189-050-70
189-390-04	189-070-01	189-130-34	503-042-01
189-390-05	189-070-20	193-020-01	503-042-03
189-390-06	189-070-63	193-020-03	193-130-27
189-390-07	177-290-06	193-020-04	193-150-25
189-390-15	189-352-17	193-030-01	178-220-04
503-060-12	445-041-18	193-040-03	189-352-05
446-023-18	445-041-19	193-040-04	189-352-18
446-023-19	445-041-21	193-050-01	189-352-19
446-023-22	446-010-21	193-050-03	189-352-20
189-680-23	446-010-23	193-050-05	189-352-21
446-041-16	446-010-32	193-060-01	189-352-22
177-260-02	178-350-16	193-070-06	189-352-25
177-260-03	177-290-03	193-090-01	503-060-13
177-260-12	177-290-04	193-110-01	503-060-24
188-390-01	446-010-62	189-752-26	446-022-15

189-352-02	445-042-03	503-100-05	189-030-74
189-352-08	503-060-03	189-753-11	189-030-78
503-100-03	503-060-05	178-201-05	189-030-17
503-100-04	503-060-43	189-753-08	189-030-24
178-010-19	178-410-01	446-043-05	189-030-26
189-130-29	178-281-01	178-201-06	446-043-02
189-351-15	178-281-02	189-753-10	446-043-31
177-250-08	178-220-27	189-080-01	177-250-20
177-250-11	178-230-11	189-140-14	446-043-03
177-250-18	178-230-32	503-100-01	446-031-20
177-270-08	189-753-04	503-100-02	446-031-22
177-270-18	189-753-01	178-290-05	446-043-14
178-010-31	445-041-38	503-060-27	446-043-19
178-160-24	178-281-26	503-060-28	446-042-27
178-170-25	178-340-07	503-060-29	189-020-21
178-201-22	178-340-08	177-290-05	189-020-22
178-201-47	178-350-06	189-130-23	193-150-26
178-201-50	178-350-07	178-201-30	189-352-12
446-041-18	178-350-24	189-753-09	189-352-14
189-070-39	178-350-44	189-753-05	189-753-03
446-022-06	178-350-61	446-042-07	189-050-57
189-050-64	178-350-62	178-240-58	189-050-65
189-130-05	189-030-18	446-010-31	189-050-74
189-130-06	189-030-19	177-160-14	189-150-12
189-130-08	189-030-20	446-022-23	189-400-01
189-130-14	189-050-63	177-260-04	189-400-02
189-130-21	193-150-23	177-280-34	189-400-03
189-170-01	446-042-19	177-260-25	189-400-04
189-170-04	446-042-20	177-270-16	189-400-08
189-170-06	503-060-31	178-160-23	178-010-22

2.1.5 Latitude and Longitude

The centroid of the Project area is Latitude: N 35° 12' 8.8914" Longitude: W 118° 51' 10.0074"

2.1.6 General Plan Designation

The General Plan Land Use Designation across the Project area for Kern County is: Intensive Agriculture, Mineral & Petroleum, Residential, Other/Publicly Owned Facilities (See [Figure 3-8](#)).

The General Plan Land Use Designation across the Project area for the City of Arvin is: Industrial, Residential, and Commercial (See [Figure 3-8](#)).

2.1.7 Zoning

The Zoning designation across the Project area within Kern County is: AE-20 (Exclusive Agriculture, 20-Acre Minimum) (See [Figure 3-9](#)).

The Zoning designation across and adjacent to the Project area within the City of Arvin is: M-2 (Light Manufacturing), M-3 (General Manufacturing), R-1 (One-Family), R-4 (Multi-Family), C-1 (Restricted Commercial), A-1 (Light Ag), A-2 (General Ag) (See [Figure 3-9](#)).

2.1.8 Description of Project

2.1.8.1 District Background

Arvin-Edison Water Storage District:

Arvin-Edison Water Storage District (AEWSD) has prepared this Initial Study/Mitigated Negative Declaration (IS/MND) to address the potential environmental impacts of the proposed Expansion of District Distribution System Pipelines into Groundwater Service Area Lands Project (Project). This document has been prepared in accordance with the California Environmental Quality Act (CEQA), Public Resources Code §21000 et seq. AEWSD is the CEQA lead agency for this Project.

The proposed Project will be located on AEWSD property and private property. All of the proposed construction and operational activities associated with the implementation of the proposed Project are analyzed in this IS/MND pursuant to CEQA. See [Figure 2-3](#).

2.1.8.2 Project Description

AEWSD currently provides surface water to irrigate lands in its Surface Water Service Area (SWSA), In-Lieu and Temporary Water service areas. The Groundwater Service Area (GWSA) historically relied on groundwater from private landowner wells for irrigation. As a result, the GWSA encompasses areas of historically low water levels and throughout the years the District has developed and maintained projects to sustainably maintain the groundwater resource. In recent years, AEWSD has delivered surface water under Temporary Water Service Contracts (Temporary Water) to certain GWSA lands that have access to existing AEWSD distribution system (canals or pipelines) when surface water supplies are available beyond the needs of the SWSA and as existing facilities allow for such Temporary Water delivery in order to maximize the use of the District's surface water supplies. The proposed Project will assist the District in complying with the Sustainable Groundwater Management Act (passed in 2014) regulations and the Project is listed in the Projects and Management Actions of the District's Groundwater Sustainability Plan (GSP)¹.

The proposed Project is for the construction of up to 44 miles of pipelines, manholes, turnouts, and associated appurtenances within AEWSD's jurisdictional boundaries. Assuming a maximum of 50' width for possible ground disturbance along the proposed pipeline construction, the Area of Potential Effect is approximately 267-acres. The Project goal is to deliver wet-period surface water to landowners who would otherwise pump groundwater in the remaining portions of the GWSA that cannot access the current distribution system. The proposed pipelines will be operated when excess surface water is available (approximately every three years) and/or during water transfers. The proposed pipelines will be mainly low-head gravity distribution pipelines ranging from 12" to 72" in diameter. The largest pipe sizes would be proportionally short distances near the heads of the branching gravity pipeline networks serving the various private agricultural fields in the area of potential effect (APE). The proposed pipeline sizes and capacities will vary depending upon the number of acres served. Pipeline sizing will follow the conservative value of approximately eight gallons per minute per acre (8 gpm/acre) and/or the AEWSD Lateral Demand Sizing Criteria. The proposed pipelines will commence from various existing AEWSD facilities, such as the Forrest Frick Pipeline, North Canal, South Canal, or other

¹ <https://aewsd.org/wp-content/uploads/AEWSD-GSP-FINAL-2019-01-21.pdf>

smaller lateral pipelines. A 0.75 mile open canal is also proposed from the existing Tejon Spreading Works project.

All proposed pipelines will deliver surface water to various proposed private farmland turnouts for irrigation and/or recharge purposes. Specifically, for the “DiGiorgio Unit”, the project may include a recovery component whereby the existing private landowner wells can pump groundwater back into the proposed AEWS D distribution pipelines and discharge into the North Canal. The recovery option allows AEWS D to deliver water to other agricultural lands in the SWSA’s when surface water supplies are in short supply, such as drought. The “DiGiorgio Unit” proposed pipeline will also connect to AEWS D’s Sunset Groundwater Recharge Facility project (approved under SCH # 2020060233), so surface water can be conveyed from the North Canal to the District’s Sunset Groundwater Recharge Facility.

The vast majority of proposed pipeline alignments will be installed on private agricultural property parallel to existing public county road right of way or along existing private dirt farm roads between fields/orchards using the traditional cut-and-cover construction method. Short segments of the proposed pipelines will cross public county road right of way and require an encroachment permit from Kern County. If Kern County requires through traffic during pipeline construction, some of these short pipeline segments may be constructed using the jack and bore construction method. All proposed pipeline alignments will avoid existing structures, utilities, permanent crops, and sensitive habitats whenever possible. There will be new turnouts in the canals. The canals are concrete lined. All of the pipeline laterals are buried. Within the “Tejon Unit”, the new lateral pipelines will extend from a proposed earthen canal extending $\frac{3}{4}$ mile from AEWS D’s Tejon Spreading Works across approximately $\frac{1}{2}$ mile of AEWS D property and $\frac{1}{4}$ mile of private farmland.

2.1.8.3 Construction, Operation and Maintenance

Construction of the Project is anticipated to be completed over several years. The Project includes mobilization, site preparation, earthwork and structures and pipeline placement. Work will be done intermittently, as funding becomes available.

Construction equipment would likely include grading equipment and hauling trucks.

Generally, construction would occur between the hours of 7am and 5pm, Monday through Friday, excluding holidays. Construction would require temporary staging and storage of materials and equipment. Staging areas would be located onsite within the APE.

Although construction is not expected to generate hazardous waste, field equipment used during construction has the potential to contain various hazardous materials such as diesel fuel, hydraulic oil, grease, solvents, adhesives, paints, and other petroleum-based products.

Operation and maintenance of the pipelines and associated appurtenances would be performed by AEWS D’s existing staff.

2.1.9 Surrounding Land Uses and Setting

The Project area is surrounded by agricultural lands, most of which is currently in production. The vast majority of proposed pipeline alignments will be installed on AEWS D property, private agricultural property parallel to existing public county road right of way or along existing private dirt farm roads between fields/orchards. A small portion of the Project area is within the City of Arvin city limits. This portion of the Project is surrounded by agricultural or vacant lands, with a residential neighborhood to the north.

2.1.10 Other Public Agencies Whose Approval May Be Required

Permits that may be required:

- State Water Resources Control Board – NPDES Construction General Permit
- San Joaquin Valley Air Pollution Control District – Rules and Regulations (Regulation VIII, Rule 9510, Rule 4641)
- Kern County – Encroachment Permits
- City of Arvin – Encroachment Permits

2.1.11 Consultation with California Native American Tribes

Assembly Bill 52 (AB 52; codified at Public Resources Code Section 21080.3.1, *et seq.*) requires that a lead agency, within 14 days of determining that it would undertake a project, must notify in writing any California Native American Tribe traditionally and culturally affiliated with the geographic area of the project if that Tribe has previously requested notification about projects in that geographic area. The notice must briefly describe the project and inquire whether the Tribe wishes to initiate request formal consultation. Tribes have 30 days from receipt of notification to request formal consultation. The lead agency then has 30 days to initiate the consultation, which then continues until the parties come to an agreement regarding necessary mitigation or agree that no mitigation is needed, or one or both parties determine that negotiation occurred in good faith, but no agreement would be made.

The District has not received any written correspondence from a Tribe pursuant to Public Resources Code Section 21080.3.1 requesting notification of proposed projects. All Tribal correspondence is discussed in further detail in sections 3.5 and 3.18 of Chapter 3.

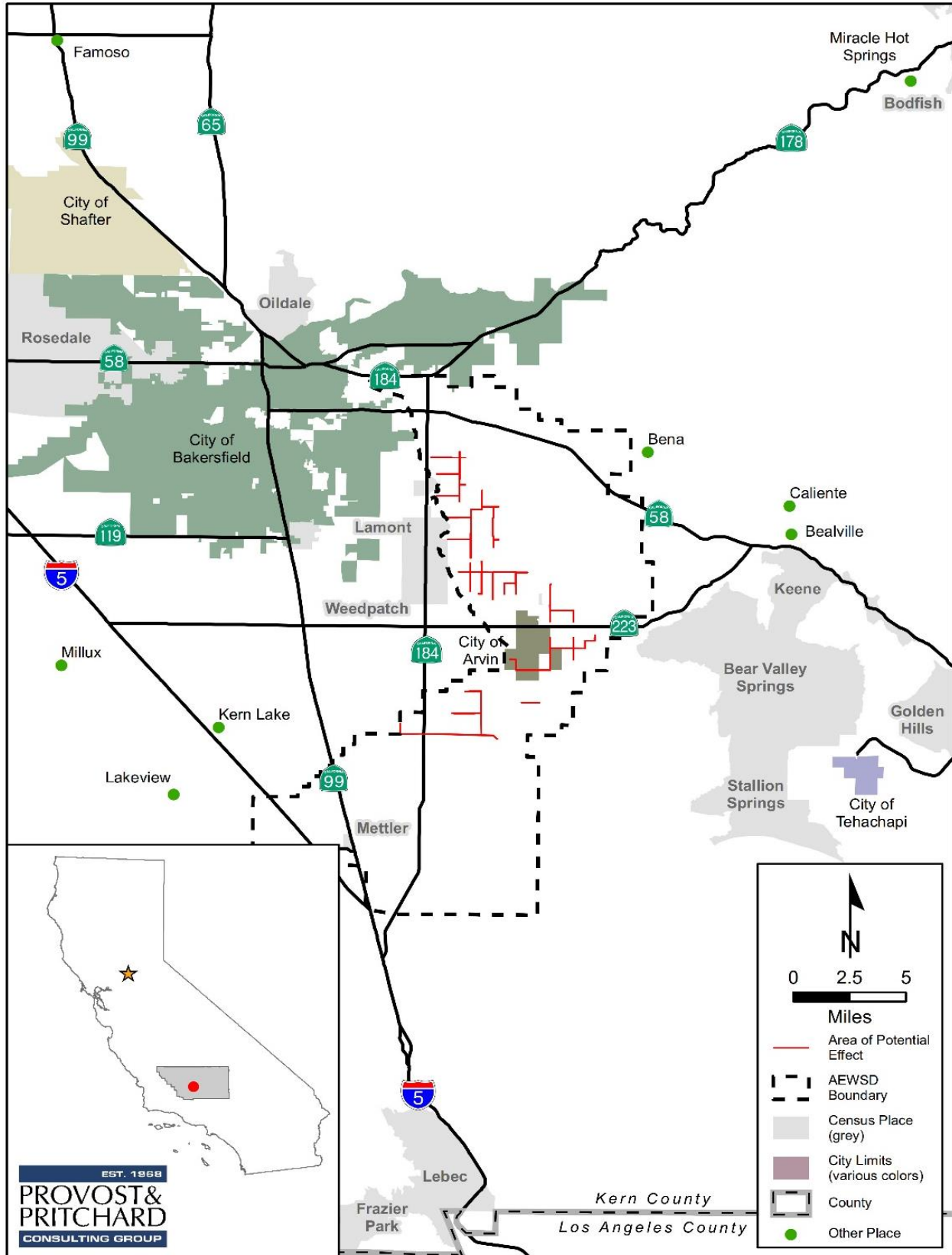


Figure 2-1. Regional Vicinity Map

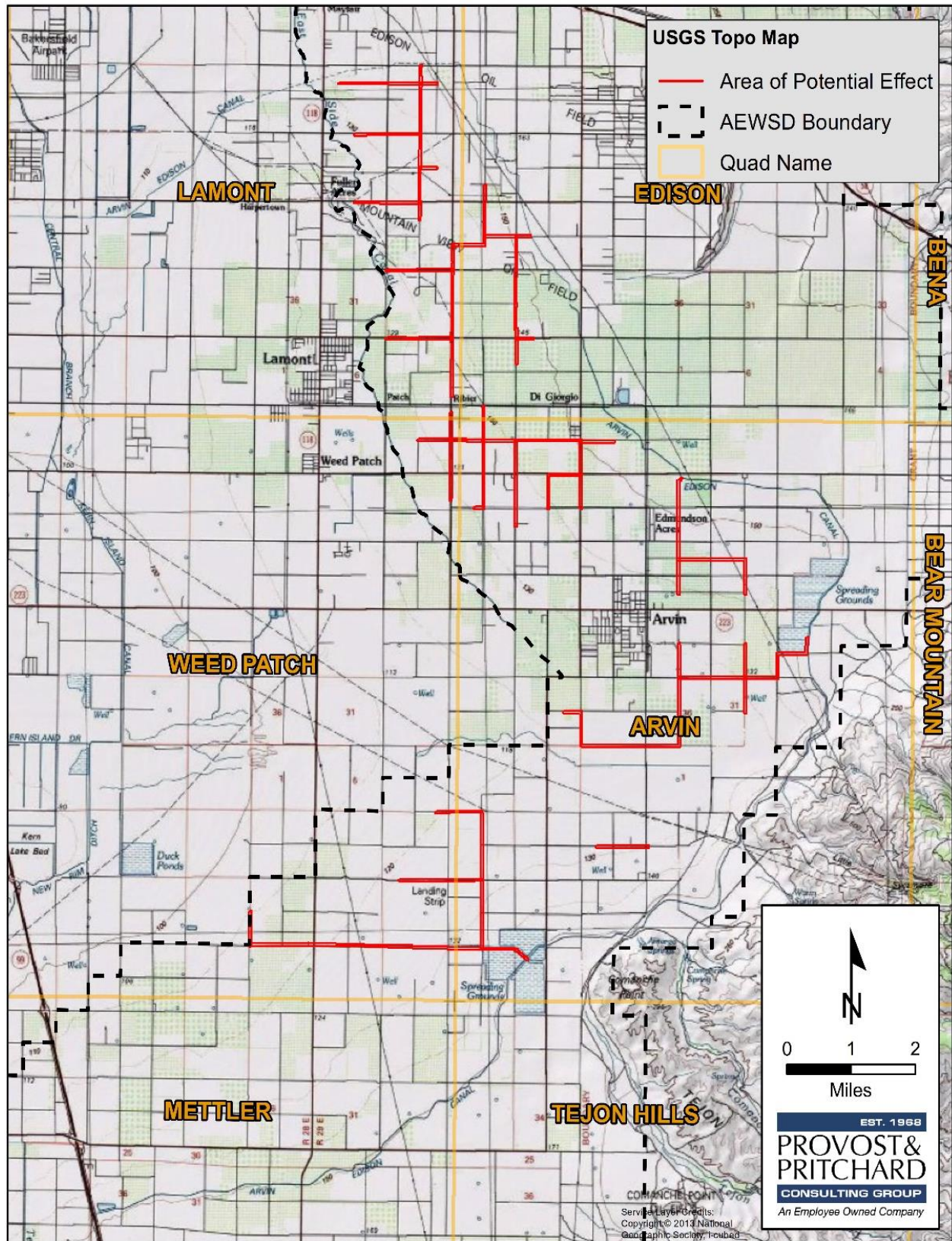


Figure 2-2. Topographic Quadrangle Map

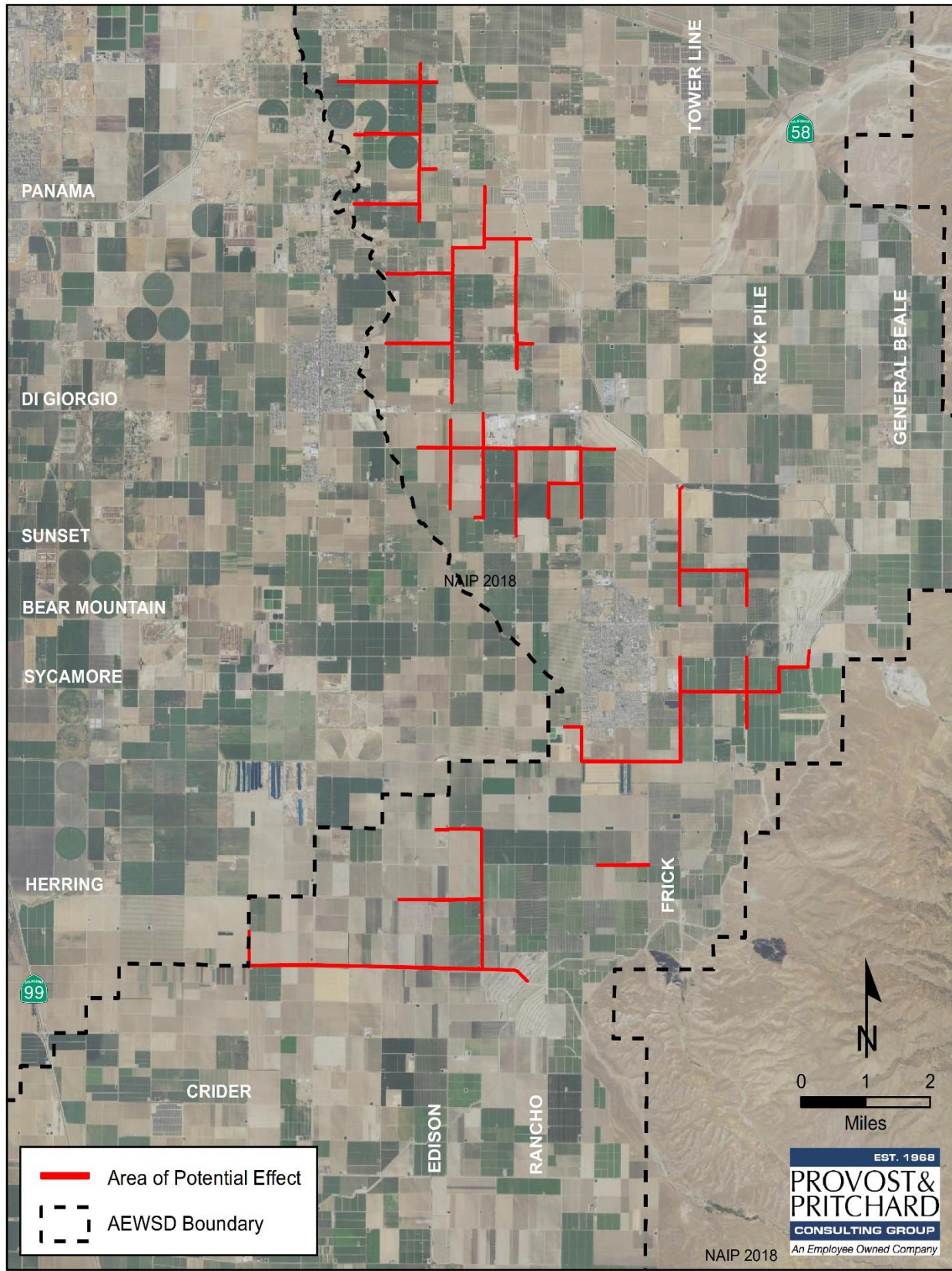


Figure 2-3. Area of Potential Effect with AEWSD Boundary.

2.2 Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this project, as indicated by the checklist and subsequent discussion on the following pages.

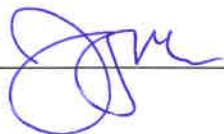
- | | | |
|--|--|--|
| ☐ Aesthetics | ☐ Agriculture Resources | ☐ Air Quality |
| ☒ Biological Resources | ☒ Cultural Resources | ☐ Energy |
| ☐ Geology/Soils | ☐ Greenhouse Gas Emissions | ☐ Hazards & Hazardous Materials |
| ☐ Hydrology/Water Quality | ☐ Land Use/Planning | ☐ Mineral Resources |
| ☐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

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

- ☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION would be prepared.
- ☒ I find that although the proposed project could have a significant effect on the environment, there would 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 would 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



Jeevan Muhar/ Engineer-Manager

Printed Name/Position

Date

4-7-21

Chapter 3 Impact Analysis

3.1 Aesthetics

Table 3-1. Aesthetics Impacts

Aesthetics				
Except as provided in Public Resources Code Section 21099, would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) In non-urbanized areas substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☐	☒
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

3.1.1 Environmental Setting

The Project area is a few miles west of the Sierra-Tehachapi foothills within the land use jurisdiction of County of Kern and the City of Arvin. (see **Figure 2-1**). Topographically, the Project area is at an elevation of approximately 400 feet above mean sea level. The existing land uses surrounding the Project area are predominantly agriculture. (vineyards, oranges, almonds, potatoes, carrots, and a variety of annual crops (peppers, onions, melons).

3.1.2 Impact Assessment

a) Have a substantial adverse effect on a scenic vista?

No Impact. The Project will construct up to 44 miles of pipelines, manholes and turnouts. These will largely be within road right of way or on private property. The pipelines will be underground and any above ground infrastructure will be consistent with the agricultural aesthetic of the area. The Project will not alter any views in the Project area. There would be no impact.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

No Impact. The Scenic Highway Program protects and enhances California's natural scenic beauty by allowing county and city governments to apply to the California Department of Transportation (Caltrans) to establish a scenic corridor protection program. One scenic corridor State route is located near the Project area: State Route 58. According to Caltrans, Highway 58 is classified as an Eligible State Scenic Highway. Highway 58 is approximately 1.5 miles from the northern end of the Project. The majority of Project construction will be

underground, therefore making visibility between the Project and the highway a non-issue. There would be no impact.

c) Would the project, in non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

No Impact. The Project area is predominantly surrounded by agricultural land used for crops. The construction of the pipelines, manholes and turnouts will be similar in visual character to the surrounding landscape and would not degrade the existing visual character or quality of the area or its surroundings. There would be no impact.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

No Impact. The Project does not involve any new lighting or surfaces that could cause glare. There would be no impact.

3.2 Agriculture and Forestry Resources

Table 3-2. Agriculture and Forestry Resources Impacts

Agriculture and Forest Resources				
Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

3.2.1 Environmental Setting

The Project is located in the California's Central San Joaquin Valley. Specifically, within an unincorporated area in Kern County. Kern County is located within California's agricultural heartland. A wide range of commodities are grown in the county, with major production of milk, poultry, livestock, and other animal commodities, row crops, nuts and fruit tree crops, and vegetables. For crop year 2019, Kern County's top commodities were almonds, grapes and citrus.² Rich soil, irrigation water, Mediterranean climate and steady access to local, national and global markets make this possible.

3.2.2 Impact Assessment

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?

No Impact. The Farmland Mapping and Monitoring Program produces maps and statistical data used for analyzing impacts to California's agriculture resources. These maps are updated on a biennial basis with the use of a computer mapping system, aerial imagery, public review, and field reconnaissance. The farmland maps

² 2019 Kern County Agricultural Crop Report. [crop2019.pdf \(kernag.com\)](http://crop2019.pdf(kernag.com)) Accessed January 2021

identify eight land use categories, five of which are agriculture related: prime agriculture, farmland of statewide importance, unique farmland, farmland of local importance, and grazing land. The land use categories onsite and in the proximity of the Project are summarized below:

- *PRIME FARMLAND (P): Farmland with the best combination of physical and chemical features able to sustain long term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.*
- *FARMLAND OF STATEWIDE IMPORTANCE (S): Farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.*
- *FARMLAND OF LOCAL IMPORTANCE (L): Land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee.*

As demonstrated in **Figure 3-1**, the FMMP and according to the Kern County General Plan various portions of the Project area is currently zoned as Exclusive Agriculture. The proposed Project would be compatible with the goals and policies of the Kern County General Plan for protecting agricultural resources by enabling the District to deliver wet-period surface water to landowners and would reduce the need for ground water pumping and also the potential for District lands to be converted to residential, commercial or other non-agricultural uses including fallowing. Water infrastructure is a permitted use in agricultural zoning districts and agricultural preserves. Local land use authorities do not recognize the proposed Project as a conversion of farmland to non-agricultural use, but rather see the project as an agricultural or agricultural support operation. The proposed Project would not indirectly induce loss of farmland in the Project area, as is typical of projects that convert agricultural lands to residential or commercial uses. By providing more surface water accessibility, and reducing ground water pumping, more groundwater will be available to sustain otherwise declining groundwater levels and support agricultural resources in the region, and thereby avoid eventual fallowing or conversion to non-agriculture uses that may occur without the Project particularly in light of the Sustainable Groundwater Management Act (SGMA) of 2014. Accordingly, there would be no conversion to non-agricultural use. There would be no impact.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

No Impact. The vast majority of proposed pipeline alignments will be installed on private agricultural property parallel to existing public county road right of way or along existing private dirt farm roads between fields/orchards using the traditional cut-and-cover construction method. The installation of pipelines is an allowed use on land with Williamson Act Contracts³. Implementation of the Project will not result in a conflict with existing zoning for agricultural use, nor will it conflict with Williamson Act contracts of agricultural uses in the vicinity. There would be no impact.

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

d) Result in the loss of forest land or conversion of forest land to non-forest use?

No Impact. The site is not zoned for forestry and is not forested. The Project vicinity is dominated by active agricultural land. The Project would not impact forest land. There is no impact.

³ Kern County Agricultural Preserve Standard Uniform Rules. [FORM 505 - Agricultural Preserve Uniform Rules.pdf](#) Accessed January 2021.

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?

No Impact. Any impacts regarding the potential conversion of farmland due to the Project's location have been discussed in the analysis of Impacts a) and b). There would be no impact.

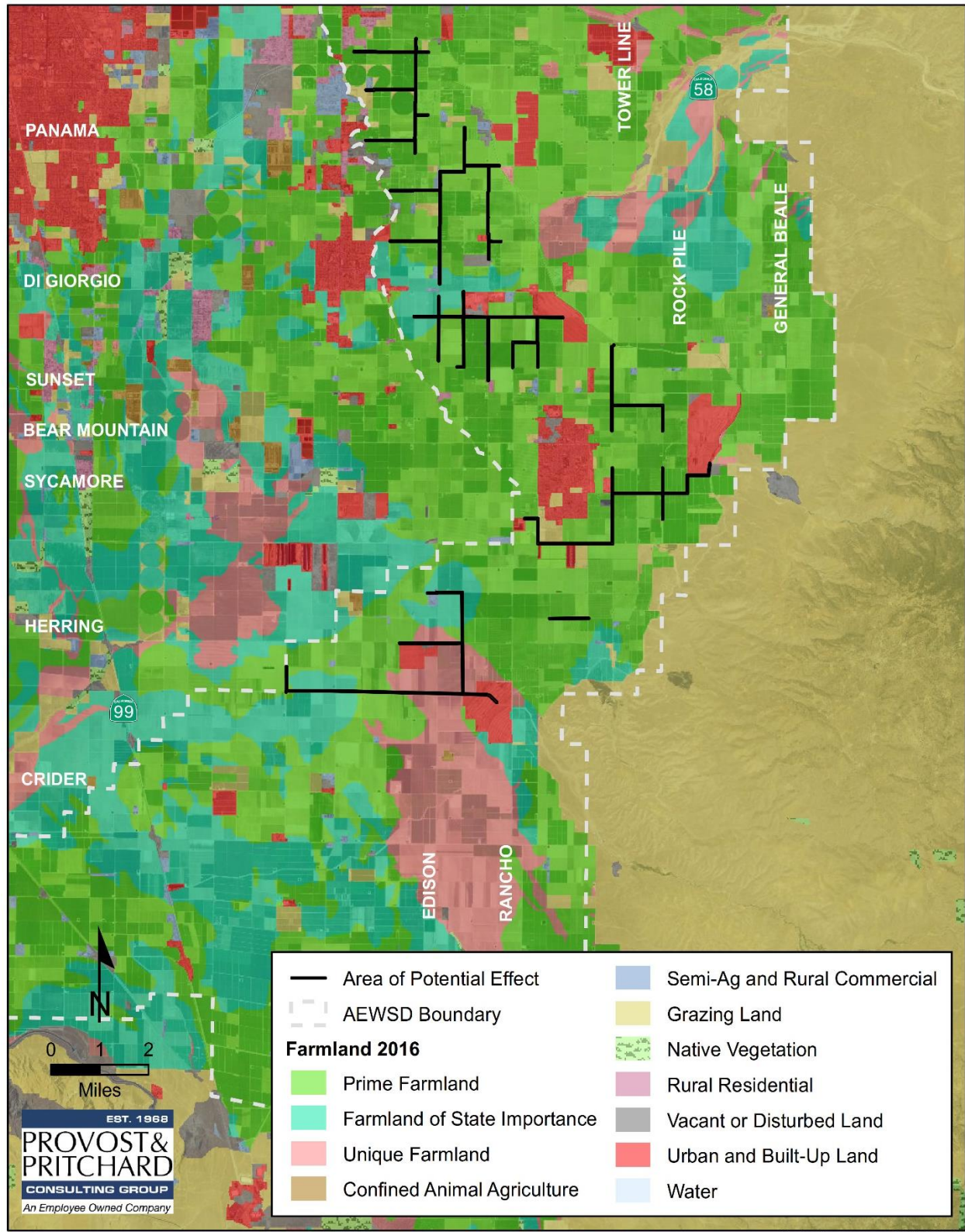


Figure 3-1. Farmland Designation Map

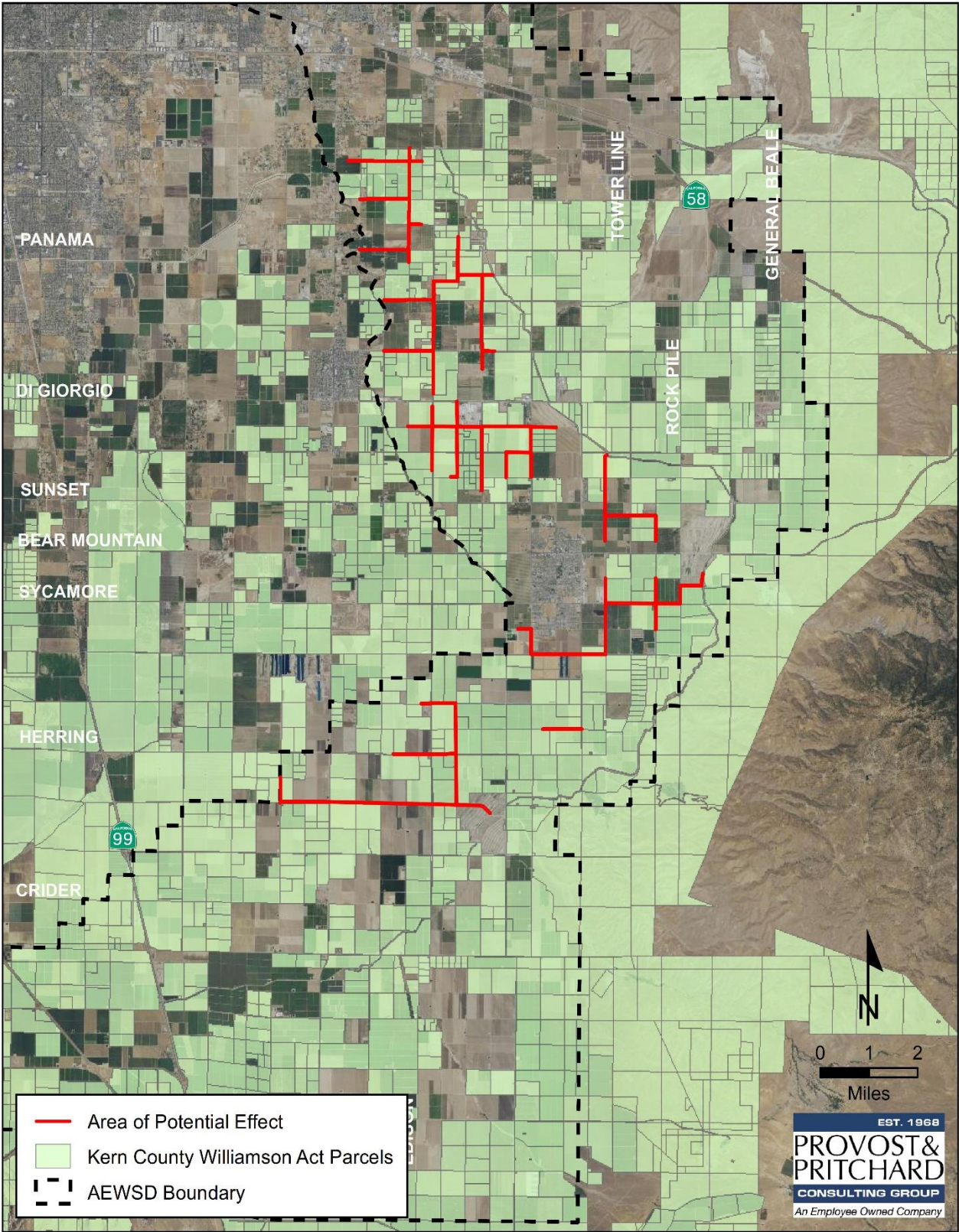


Figure 3-2. Williamson Act Parcel Map

3.3 Air Quality

Table 3-3. Air Quality Impacts

Air Quality				
Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d) Result in other emissions (such as those leading to odors adversely affecting a substantial number of people)?	☐	☐	☐	☒

3.3.1 Environmental Setting

The Project is located in the San Joaquin Valley Air Basin (SJVAB or air basin). The San Joaquin Valley Air Pollution Control District (SJVAPCD) provides Guidelines for Assessing and Mitigating Air Quality Impacts (GAMAQI) for quantification of emissions and evaluation of potential impacts to air resources⁴ and Guidance for Land-Use Agencies in addressing greenhouse gas (GHG) Emission Impacts for New Projects under CEQA.⁵

3.3.1.1 Regulatory Attainment Designations

Under the California Clean Air Act (CCAA), the California Air Resources Board (CARB) is required to designate areas of the State as attainment, nonattainment, or unclassified with respect to applicable standards. An “attainment” designation for an area signifies that pollutant concentrations did not violate the applicable standard in that area. A “nonattainment” designation indicates that a pollutant concentration violated the applicable standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria. Depending on the frequency and severity of pollutants exceeding applicable standards, the nonattainment designation can be further classified as serious nonattainment, severe nonattainment, or extreme nonattainment, with extreme nonattainment being the most severe of the classifications. An “unclassified” designation signifies that the data does not support either an attainment or nonattainment designation. The CCAA divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

The EPA designates areas for ozone, CO, and NO₂ as “does not meet the primary standards,” “cannot be classified,” or “better than national standards.” For SO₂, areas are designated as “does not meet the primary standards,” “does not meet the secondary standards,” “cannot be classified,” or “better than national

⁴ SJVAPCD GAMAQI <https://www.valleyair.org/transportation/GAMAQI-2015/FINAL-DRAFT-GAMAQI.PDF>. Accessed July 2020.

⁵ Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA. <http://www.valleyair.org/Programs/CCAP/12-17-09/3%20CCAP%20-%20FINAL%20LU%20Guidance%20-%20Dec%2017%202009.pdf> Accessed September 2020.

standards.” However, the CARB terminology of attainment, nonattainment, and unclassified is more frequently used. The EPA uses the same sub-categories for nonattainment status: serious, severe, and extreme. In 1991, EPA assigned new nonattainment designations to areas that had previously been classified as Group I, II, or III for PM_{10} based on the likelihood that they would violate national PM_{10} standards. All other areas are designated “unclassified.”

The State and national attainment status designations pertaining to the SJVAB are summarized in **Table 3-4**. The SJVAB is currently designated as a nonattainment area with respect to the State PM_{10} standard, ozone, and $PM_{2.5}$ standards. The SJVAB is designated nonattainment for the NAAQS 8-hour ozone and $PM_{2.5}$ standards. On September 25, 2008, the EPA re-designated the San Joaquin Valley to attainment status for the PM_{10} NAAQS and approved the PM_{10} Maintenance Plan.

Table 3-4. Summary of Ambient Air Quality Standards and Attainment Designation

Pollutant	Averaging Time	California Standards*		National Standards*	
		Concentration*	Attainment Status	Primary	Attainment Status
Ozone (O ₃)	1-hour	0.09 ppm	Nonattainment/ Severe	–	No Federal Standard
	8-hour	0.070 ppm	Nonattainment	0.075 ppm	Nonattainment (Extreme)**
Particulate Matter (PM ₁₀)	AAM	20 µg/m ³	Nonattainment	–	Attainment
	24-hour	50 µg/m ³		150 µg/m ³	
Fine Particulate Matter (PM _{2.5})	AAM	12 µg/m ³	Nonattainment	12 µg/m ³	Nonattainment
	24-hour	No Standard		35 µg/m ³	
Carbon Monoxide (CO)	1-hour	20 ppm	Attainment/ Unclassified	35 ppm	Attainment/ Unclassified
	8-hour	9 ppm		9 ppm	
	8-hour (Lake Tahoe)	6 ppm		–	
Nitrogen Dioxide (NO ₂)	AAM	0.030 ppm	Attainment	53 ppb	Attainment/ Unclassified
	1-hour	0.18 ppm		100 ppb	
Sulfur Dioxide (SO ₂)	AAM	–	Attainment	--	Attainment/ Unclassified
	24-hour	0.04 ppm		--	
	3-hour	–		0.5 ppm	
	1-hour	0.25 ppm		75 ppb	
Lead (Pb)	30-day Average	1.5 µg/m ³	Attainment	–	No Designation/ Classification
	Calendar Quarter	–		--	
	Rolling 3-Month Average	–		0.15 µg/m ³	
Sulfates (SO ₄)	24-hour	25 µg/m ³	Attainment	No Federal Standards	
Hydrogen Sulfide (H ₂ S)	1-hour	0.03 ppm (42 µg/m ³)	Unclassified		
Vinyl Chloride (C ₂ H ₃ Cl)	24-hour	0.01 ppm (26 µg/m ³)	Attainment		
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient: 0.23/km-visibility of 10 miles or more due to particles when the relative humidity is less than 70%.	Unclassified		

* For more information on standards visit: <https://ww3.arb.ca.gov/research/aaqs/aaqs2.pdf>

** No Federal 1-hour standard. Reclassified extreme nonattainment for the Federal 8-hour standard September 2020.

***Secondary Standard

Source: CARB 2015; SJV APCD 2015

3.3.2 Methodology of Determining the Significance of Air Quality Impacts

Conclusions in this Air Quality Impact Assessment rely on model calculations (CalEEMod version 2016.3.2), and information found in the CalEEMod Output Files ([Appendix A](#)). The sections below detail these conclusions and recommendations and utilize its conclusions in the impact determinations.

To assist local jurisdictions in the evaluation of air quality impacts, the SJVAPCD published the GAMAQI. This guidance document includes recommended thresholds of significance to be used for the evaluation of short-term construction, long-term operational, odor, toxic air contaminant, and cumulative air quality impacts. Accordingly, the SJVAPCD-recommended thresholds of significance are used to determine whether implementation of the Project would result in a significant air quality impact. Projects that exceed these recommended thresholds would be considered to have a potentially significant impact to human health and welfare. The thresholds of significance are included in [Table 3-7](#) through [Table 3-8](#) to provide for a comparative significance determination.

Assessment of the significance of project air quality impacts may be considered on a regional or localized level. Determination of project impacts on achieving the goal of air quality plans and evaluating impacts related to emissions of criteria pollutants are considered on both regional and localized levels in this analysis. Evaluation of impacts to sensitive receptors considers the project's localized criteria pollutant emissions in this analysis. Sources of the project's localized criteria pollutant emissions would include: reactive organic gases (ROG), Nitrogen oxides (NO_x), PM_{2.5}, PM₁₀, CO, NO₂, and Toxic Air Contaminants (TACs) which include acetaldehyde, benzene, 1,3 butadiene, carbon tetrachloride, hexavalent chromium, paradichlorobenzene, formaldehyde, methylene chloride, perchloroethylene, and diesel particulate matter a complex mixture of substances.

3.3.2.1 Short-Term Construction-Generated Emissions

Short-term construction emissions associated with the Project were estimated using CalEEMod. The emissions modeling includes emissions generated by construction and grading equipment most commonly associated with the site work, equipment delivery, and vehicle, equipment, and worker fuel usage. In reality two years construction time will take place intermittently over multiple years. For simplicity, emissions were quantified based on a construction schedule and construction equipment requirements that would occur over approximately 24 consecutive months. If anything, this approach is more conservative and shows emissions that would be higher than the reality of spreading construction out intermittently over multiple years. All remaining assumptions were based on the default parameters contained in the model. Modeling assumptions and output files are included in [Appendix A](#).

The SJVAPCD is responsible for controlling emissions primarily from stationary sources. However, the SJVAPCD also coordinates with the APCD's eight county Councils of Government (COGs) or Metropolitan Planning Organizations (MPOs) that are responsible for regional transportation planning and funding programs. The COG and MPO Transportation Planning Programs are used by SJVAPCD in its responsibilities in developing, updating, and implementing air quality attainment plans for the air basin. The SJVAPCD has adopted ozone plans and particulate matter plans for purposes of controlling harmful emissions and achieving attainment of state and national attainment standards. A project that would exceed established thresholds for criteria pollutants would be considered to have a significant impact on the implementation of air quality plans and would also constitute a cumulatively considerable net increase of criteria pollutants for which the air basin is in non-attainment.

Construction of the Project is expected to begin after Project approval with full buildout completed in 2026. The results of the emissions modeling for the Project are presented in [Table 3-5](#).

Table 3-5. Short-Term - Construction-Generated Emissions of Criteria Air Pollutants

Year	Annual Emissions (Tons/Year)				
	ROG	NO _x	CO	PM ₁₀	PM _{2.5}
2022	0.3980	4.1680	2.4401	2.2038	1.0081
2023	0.2732	2.6927	2.5349	0.9580	0.2942
2024	0.0317	0.2966	0.4343	0.0148	0.0149
Maximum Annual Proposed Project Emissions:	0.3980	4.1680	2.5349	2.2038	1.0081
SJVAPCD Significance Thresholds:	10	10	100	15	15
Exceed SJVAPCD Thresholds?	No	No	No	No	No

3.3.2.2 Long-Term - Operational Emissions

The unmitigated long-term operational emissions for the Project are listed in **Table 3-6**. Operational emissions would occur over the lifetime of the Project and result from two main Project-specific sources: District maintenance, and motor vehicles (operations and maintenance crew) usage categorized as mobile sources in the table. Area source emissions are defined as emissions resulting from landscaping and painting. Energy source emissions would be from things on the site that require additional power. Completion of some portions of the Project is expected as early as 2022 and was used as the Project buildout modeling year as a conservative assumption. The SJVAPCD considers construction and operational assumptions separately when making significance determinations. Modeling assumptions and output files are included in **Appendix A**.

Table 3-6. Unmitigated Long-Term Operational Emissions

Source	Annual Emissions (Tons/Year)				
	ROG	NO _x	CO	PM ₁₀	PM _{2.5}
Area	0.9946	<0.01	<0.01	<0.01	<0.01
Energy:	0.00	0.00	0.00	0.00	0.00
Mobile	0.00	0.00	0.00	0.00	0.00
Total Operational Emissions Any Year	0.9946	<0.01	<0.01	<0.01	<0.01
SJVAPCD Significance Thresholds:	10	10	100	15	15
Exceed SJVAPCD Thresholds?	No	No	No	No	No

3.3.3 Screening Thresholds for Determining Impacts to Sensitive Receptors

Impacts to sensitive receptors would occur primarily during Project construction. Construction activities could produce short-term emissions that have the potential in large concentrations to contribute to cancer risk over a 70-year exposure period. The Air Quality and GHG reports (**Appendix A**) provide technical information on the types of pollutants that have the potential to affect sensitive receptors.

The SJVAB includes screening thresholds for identifying projects that need detailed analysis for localized impacts. Projects with on-site emission increases from construction activities that exceed the 100 pounds per day screening level of any criteria pollutant after compliance with Rule 9510 and implementation of all applicable mitigation measures would require preparation of an ambient air quality analysis. The criteria pollutants of concern are NO_x, CO, PM₁₀, and PM_{2.5}. There is no localized emission standard for ROG and

most types of ROG are not toxic and have no health-based standard, however, ROG was included for informational purposes only.

Table 3-7 lists the maximum daily air pollutant emissions generated by the Project during construction.

Table 3-7. Maximum Daily Air Pollutant Emissions During Construction

Maximum Daily Emissions by Year	Emissions (Pounds/Daily)				
	ROG	NO _x	CO	PM ₁₀	PM _{2.5}
Construction 2022	4.2668	46.4491	31.3344	20.2761	11.8562
Construction 2023	3.6949	38.8874	29.4566	17.3057	5.8829
Construction 2024	1.0981	10.2310	14.9632	0.6755	0.5139
Maximum Daily Proposed Project Emissions:	4.2668	46.4491	31.3344	20.2761	11.8562
SJVAPCD Screening Thresholds	100	100	100	100	100

Operational emission would begin to accrue upon completion of the Project. Portions of the Project are anticipated to be completed as early as 2022. **Table 3-8** lists the maximum daily air pollutant emissions generated by the Project during its operation.

Table 3-8. Maximum Daily Air Pollutant Emissions During Operation

Maximum Daily Emissions	Emissions (Pounds/Daily)				
	ROG	NO _x	CO	PM ₁₀	PM _{2.5}
Area	5.4513	<0.01	0.0272	<0.01	<0.01
Energy	0.00	0.00	0.00	0.00	0.00
Mobile	0.00	0.00	0.00	0.00	0.00
Total Daily Emissions	5.4513	<0.01	0.0272	<0.01	<0.01
SJVAPCD Screening Thresholds	100	100	100	100	100
Exceed SJVAPCD Thresholds?	No	No	No	No	No

Table 3-7 and **Table 3-8** demonstrate the Project's impacts as evaluated against SJVAPCD screening thresholds for criteria pollutant emissions used to determine significance in accordance with health-based standards would not exceed and would be considerably below the significance thresholds.

3.3.4 Impact Assessment

a) Would the project conflict with or obstruct implementation of the applicable air quality plan?

Less than Significant Impact. The CEQA Guidelines indicate that a significant impact would occur if the Project would conflict with or obstruct implementation of the applicable air quality plan. The GAMAQI does not provide specific guidance on analyzing conformity with the Air Quality Plan (AQP). Therefore, the Air Quality and GHG report (Appendix A) assumed the following criteria for determining Project consistency with the current AQPs:

1. Will the project result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQPs?

Whether this criterion is met is determined by comparison of Project emissions to the regional and localized thresholds identified by the SJVAPCD for regional and local air pollutants.

2. Will the project comply with applicable control measures set forth in the AQPs?

The primary control measures applicable to development projects in the SJVAPCD is the required compliance with *Regulation VIII-Fugitive PM₁₀ Prohibitions* and *Rule 9510-Indirect Source Review*.

Regional air quality impacts and attainment of standards are the result of cumulative impacts of all emission sources within the air basin. Individual projects are generally not large enough to contribute measurably to an existing violation of air quality standards. Therefore, the cumulative impact of the Project is important because it is based on its cumulative contribution combined with one or more other closely related past, present, and reasonably foreseeable probably future projects emitting similar emissions. Because of the region's non-attainment status for ozone, PM_{2.5}, and PM₁₀, if Project generated emission of either of the ozone precursor pollutants ROG, NO_x, PM₁₀, or PM_{2.5} would exceed the SJVAPCD's significance thresholds, then the Project would be considered to contribute to violations of the applicable standards and conflict with the attainment plans. As demonstrated in **Table 3-5** for construction-generated emissions, and in **Table 3-6**, operational emissions of criteria pollutants would not exceed the SJVAPCD's significance thresholds. Therefore, the Project will not contribute to air quality violations in conflict with attainment plans.

As stated in No. 2 above, the AQP contains a number of control measures, including *Regulation VIII-Fugitive PM₁₀ Prohibitions* and *Rule 9510-Indirect Source Review* which are applicable to the Project. Both of these are adopted by the SJVAPCD and constitute enforceable requirements with which the Project must comply. The Project is expected to comply with all applicable SJVAPCD rules and regulations; therefore, the Project complies with the criterion and would not conflict with or obstruct implementation of the applicable air quality attainment plans and the impact would be less than significant.

b) Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

Less than Significant Impact. To result in a less than significant impact, the following criteria must be true:

1. Regional analysis: emission of non-attainment pollutants must be below the SJVAPCD's regional significance thresholds.

This is an approach recommended by the SJVAPCD in its GAMAQI.

2. Summary of projections: the project must be consistent with current air quality attainment plans including control measures and regulations.

This is an approach consistent with Section 15130(b) of the CEQA Guidelines.

3. Cumulative health impacts: the project must result in less than significant cumulative health effects from the non-attainment pollutants.

This approach correlates the significance of the regional analysis with health effects, consistent with the court decision in *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1219-20.

As discussed in impact question a) above, Project generated emissions are below the SJVAPCD's regional significance thresholds and the Project is consistent with current air quality attainment plans including control measures and regulations.

With respect to cumulative health impacts, the air basin is in non-attainment for ozone, PM_{2.5}, and PM₁₀ (state only), which means that the background levels of those pollutants are at times higher than the ambient air

quality standards. The air quality standards were set to protect public health, including the health of sensitive individuals (such as children, the elderly, and persons with pre-existing respiratory or cardiovascular illnesses (the infirm)). Therefore, when the concentration of those pollutants exceeds the standard, it is likely that some sensitive individuals in the population would experience adverse health effects. Since the air basin is already in non-attainment, it is considered to have an existing significant cumulative health impact without the Project. The issue is whether the Project's contribution to the existing violation of air quality standards is cumulatively considerable.

The SJVAPCD through its GAMAQI has determined that projects that exceed regional thresholds would have a cumulatively considerable health impact. As demonstrated in **Table 3-7** and **Table 3-8**, the project would not exceed the SJVAPCD's significance thresholds and its cumulatively considerable impacts would be less than significant.

c) Would the project expose sensitive receptors to substantial pollutant concentrations?

Less than Significant Impact. Sensitive receptors are those who are sensitive to air pollution, including children, the elderly, and the infirm. The SJVAPCD considers a sensitive receptor a location that houses or attracts children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Examples of sensitive receptors include hospitals, residences, convalescent facilities, and schools. The closest existing off-site sensitive receptors are rural single-family homes located on adjacent properties. Sensitive receptors, including schools and residences, are located within one mile of the Project area.

As demonstrated in **Table 3-7** and **Table 3-8**, the Project would not exceed the SJVAPCD's thresholds established in accordance with health-based standard for determining significance of criteria pollutant emissions. Therefore, in accordance with these standards, the Project would have a less than significant impact related to exposure of sensitive receptors to substantial pollutant concentrations.

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

No Impact. Land uses that are typically identified as sources of objectionable odors include landfills, transfer stations, sewage treatment plants, wastewater pump stations, composting facilities, feed lots, coffee roaster, asphalt batch plants, and rendering plants, among other uses. The Project does not include any of these activities or land uses. The Project would therefore have no impact with respect to generation of emissions leading to odors or other adverse or objectionable emissions.

3.4 Biological Resources

Table 3-9. Biological Resources Impacts

Biological Resources				
Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
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?	☐	☐	☐	☒
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

3.4.1 Environmental Setting

Reconnaissance-level field surveys of the Project were conducted by Rincon Biologist Brooke Fletcher (on August 20, 21, 25, and 27 and December 16, 2020). A combination of windshield and pedestrian surveys were conducted along the entire project alignment, plus a 100-foot buffer on either side. Rincon also conducted a literature review to characterize the nature and extent of biological resources on and adjacent to the Project area. This included queries of U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation system (IPaC; USFWS 2020a), CDFW California Natural Diversity Database (CNDDB; 2020a), and California Native Plant Society (CNPS) online Inventory of Rare and Endangered Plants of California (2020). The full Biological Resources Assessment (BRA) can be found in **Appendix B**. Most of the information in this section is taken directly from the BRA.

The proposed Project alignment runs exclusively through previously disturbed areas and no native vegetation communities are present within the Biological Survey Area (BSA). The majority of pipeline installation for the project will occur within existing unpaved agricultural roads or the right of way (ROW) of existing paved roads. The majority of land surrounding the pipeline alignment consists of tilled and cultivated agricultural fields. The following land cover types exist within the Project area: Agriculture, Ruderal, and Developed.

Based on the CNDDDB query of the project area and the surrounding twenty USGS quads, 36 special-status animal species were evaluated for their potential to occur within the BSA (**Appendix B**). Of these, 24 are not expected to occur, based on CNDDDB occurrence records and lack of species-specific suitable habitat. Seven special-status animal species have a low potential to occur, two have a moderate potential to occur, two have a high potential to occur, and one CDFW WL species, Cooper's hawk (*Accipiter cooperii*), was present within the BSA at the time of the field survey.

Table 3-8 provides a list of all special-status animal species with potential to occur within the project area as well as their status. Each of these species is discussed in further in **Appendix B**.

Table 3-10. List of Special Status Animal Species with Potential to Occur within the Project Site

Common Name	Scientific Name	Status
Low Potential to Occur		
Blunt-nosed leopard lizard	<i>Gambelia sila</i>	FE, SE
California glossy snake	<i>Arizona elegans occidentalis</i>	SSC
Coast horned lizard	<i>Phrynosoma blainvillii</i>	SSC
Nelson's antelope squirrel	<i>Ammospermophilus nelsoni</i>	ST
San Joaquin coachwhip	<i>Masticophis flagellum ruddocki</i>	SSC
Tehachapi pocket mouse	<i>Perognathus alticola inexpectatus</i>	SSC
Moderate Potential to Occur		
American badger	<i>Taxidea taxus</i>	SSC
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	FE, ST
High Potential to Occur		
Burrowing owl	<i>Athene cunicularia</i>	SSC
Swainson's hawk	<i>Buteo swainsoni</i>	ST
Present		
Cooper's hawk	<i>Accipiter cooperii</i>	WL

SSC = CDFW Species of Special Concern
FE = Federal Endangerment

SE = State Endangered
FT = Federal Threatened

ST = State Threatened
WL = Watch List

3.4.2 Impact Assessment

- 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.

Special-status Plants

No special-status plant species have potential to occur within the BSA. Therefore, the project is not expected to have a significant impact on any special-status plant species.

Special-status Wildlife

Construction activity associated with the project could include vegetation removal, trenching, pipe installation, equipment and vehicle staging, parking, construction noise and construction staging. These activities have the potential to directly impact special-status wildlife species and/or their habitat. Wildlife species may be injured or killed by construction activity if present during construction. Wildlife present in the project area or in adjacent areas could be impacted by construction noise and activity if that activity causes individuals to abandon breeding activity, disrupts foraging behavior, or increases competition for resources. Many of the special-status animal species with potential to occur within the BSA rely on burrow habitat, and burrows present within the project area could also be impacted by project activities. Special-status animal species with a low potential to occur within the BSA include blunt-nosed leopard lizard, California glossy snake, coast horned lizard, Nelson's antelope squirrel, San Joaquin coachwhip, Tehachapi pocket mouse, and Tipton kangaroo rat. Special-status animal species with moderate potential to occur within the BSA include American badger and San Joaquin kit fox. Special-status animal species with a high potential to occur within the BSA include burrowing owl and Swainson's hawk. A Cooper's hawk was observed within the BSA during the field reconnaissance surveys and is therefore present.

Suitable habitat for nesting birds exists within the BSA and adjacent areas and should project activities occur during nesting bird season (February 1 through September 15), then vegetation removal and noise associated with construction activities could significantly impact nesting special-status birds, as well as nesting birds protected by the MBTA and CFGC.

The following mitigation measures are recommended to reduce potential impacts to special-status wildlife species to less than significant.

Mitigation Measures for Special-status Wildlife Species

BIO-1(a) Worker Environmental Awareness Program (WEAP): Prior to initiation of construction activities (including staging and mobilization), all personnel associated with project construction shall attend WEAP training, conducted by a qualified biologist, to aid workers in recognizing special-status resources that may occur in the construction area. The specifics of this program shall include identification of the sensitive species, a description of the regulatory status and general ecological characteristics of sensitive resources, and review of the limits of construction and mitigation measures required to reduce impacts to biological resources within the work area. A fact sheet conveying this information shall also be prepared for distribution to all contractors, their employers, and other personnel involved with construction. All employees shall sign a form provided by the trainer indicating they have attended the WEAP and understand the information presented to them.

BIO-1(b) General Wildlife Pre-construction Surveys: Pre-construction clearance surveys for all special-status wildlife species shall be conducted within 30 days prior to the start of construction (including staging and mobilization) in areas of suitable habitat. The surveys shall cover the entire disturbance footprint plus a minimum 100-foot buffer within suitable habitat, where permissible, and should identify all special-status animal species that may occur on-site. Any non-listed special-status

animals observed within the project area during the survey should be relocated by a qualified biologist to a safe location within suitable habitat as near to the project area as possible. If listed species that utilize burrows, such as blunt-nosed leopard lizard, Tipton kangaroo rat, and Nelson's antelope squirrel are detected during the preconstruction survey, all suitable burrows will be flagged for avoidance by a minimum distance of 50 feet, as described in BIO-1(c) below. If listed avian species, such as Swainson's hawk are detected during the preconstruction survey, active nests shall be protected with a disturbance-free buffer as described in BIO-1(f) below. If San Joaquin kit fox individuals or known or potential dens are detected during the preconstruction survey, dens will be monitored and protected with a disturbance-free buffer, as described in BIO-1(e) below. If complete avoidance of listed species and their nests, dens, or burrows is infeasible, the project proponent shall immediately contact CDFW and USFWS regarding incidental take permits.

BIO-1(c) Focused Burrow Survey: Concurrent with the general wildlife pre-construction survey described above, a qualified biologist shall conduct a focused burrow survey within 30 days prior to the initiation of ground disturbance. All burrows within the proposed project pipeline alignments will be inspected for the potential presence of special-status animal species that utilize burrows, including American badger, Nelson's antelope squirrel, Tipton kangaroo rat, blunt-nosed leopard lizard, San Joaquin coachwhip, and coast horned lizard. If no special-status species are suspected to occupy any burrows within the project alignment, no further actions are required. If any special-status species, or their sign, are detected within burrows during the pre-construction burrow survey, then those burrows should be mapped and flagged for avoidance by minimum distance of 50 feet. If complete avoidance of burrows potentially occupied by a listed species is infeasible, the project proponent shall immediately contact CDFW and USFWS regarding incidental take permits.

BIO-1(d) Mitigation Measures for Burrowing Owl: A qualified biologist shall conduct pre-construction surveys prior to ground disturbance activities to confirm the presence/absence of burrowing owls. Pre-construction surveys shall be conducted during the appropriate time of day to maximize detectability within 30 days prior to construction and ground disturbance activities. If no burrowing owls are observed, no further actions are required. If burrowing owls are detected during the pre-construction clearance surveys, the following measures shall apply:

- Avoidance buffers during the breeding and non-breeding season should be implemented in accordance with the CDFW (2012) and Burrowing Owl Consortium (1993) minimization mitigation measures.
- If avoidance of burrowing owls is not feasible, then additional measures such as passive relocation during the nonbreeding season should be implemented, in consultation with CDFW. In addition, a Burrowing Owl Exclusion Plan and Mitigation and Monitoring Plan will be developed by a qualified biologist in accordance with the CDFW (2012) and Burrowing Owl Consortium (1993).

BIO-1(e) Mitigation Measures for San Joaquin Kit Fox

- A pre-construction clearance survey for San Joaquin kit fox shall also be conducted not less than 14 days and not more than 30 days prior to the initiation of ground-disturbing activities. The survey areas shall include the entire study area and all accessible undeveloped habitat within 200 feet, in accordance with the USFWS 2011 Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance. If any known or potential dens are detected, the den(s) shall be monitored for a minimum of three consecutive nights with remote-sensing cameras or tracking medium to evaluate current use. If San Joaquin kit fox use is observed, the den should be avoided by the recommended buffers outlined in the USFWS 2011 Standardized Recommendations, and the project proponent shall immediately notify USFWS and CDFW regarding incidental take permits.

- Construction activities shall adhere to the avoidance and minimization measures outlined in the USFWS 2011 Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance, outlined below:
 - Project-related vehicles should observe a 20-mph speed limit in all study areas, except on county roads and State and Federal highways; this is particularly important at night when kit foxes are most active. To the extent possible, night-time construction should be minimized. Off-road traffic outside of designated study areas should be prohibited.
 - To prevent inadvertent entrapment of kit foxes or other animals during the construction phase of a project, all excavated, steep-walled holes or trenches more than 2 feet deep should be covered at the close of each working day by plywood or similar materials or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they should be thoroughly inspected for trapped animals. If at any time a trapped or injured kit fox is discovered, the USFWS should be notified within three days of the discovery.
 - All food-related trash items such as wrappers, cans, bottles, and food scraps should be disposed of in closed containers and removed at least once a week from a construction or project site.
 - No firearms or pets should be allowed on the project site.
 - Use of rodenticides and herbicides in study areas should be restricted. This is necessary to prevent primary or secondary poisoning of kit foxes and the depletion of prey populations on which they depend. All uses of such compounds should observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Food and Agriculture, and other State and Federal legislation, as well as additional project-related restrictions deemed necessary by the Service. If rodent control must be conducted, zinc phosphide should be used because of proven lower risk to kit fox.

BIO-1(f) Mitigation Measures for Swainson's Hawk, Cooper's Hawk, and Nesting Birds:

Ground disturbance and vegetation removal activities shall be restricted to the non-breeding season (September 16 to January 31) when feasible. For ground disturbance and vegetation removal activities occurring during the bird nesting season (February 1 to September 15), general pre-construction nesting bird surveys shall be conducted by a qualified biologist (including for, but not limited to, Cooper's hawk and Swainson's hawk), within 30 days prior to the initiation of construction activities. Surveys shall include the disturbance area plus a 200-foot buffer for passerine species, a 500-foot buffer for raptors, and a 0.5-mile buffer for Swainson's hawk. If active nests are located, an appropriate avoidance buffer shall be established within which no work activity will be allowed which would impact these nests. The avoidance buffer would be established by the qualified biologist on a case-by-case basis based on the species and site conditions. In no cases should the buffer be smaller than 50 feet for non-raptor bird species or 200 feet for raptor species. Larger buffers may be required depending upon the status of the nest and the construction activities occurring in the vicinity of the nest. If State-listed threatened Swainson's hawks are documented nesting within 500 feet of construction activities, CDFW should be consulted on appropriate avoidance and minimization methods. The buffer area(s) should be closed to all construction personnel and equipment until juveniles have fledged and/or the nest is inactive. A qualified biologist should confirm that breeding/nesting is complete, and the nest is no longer active prior to removal of the buffer. If work within a buffer area cannot be avoided, then a qualified biologist will be present to monitor all project activities that occur within the buffer. The biological monitor will evaluate the nesting avian species for signs of disturbance and will have the ability to stop work.

Implementation of the above mitigation measures will reduce the Project's potential impacts to special status species to a less than significant level and will ensure compliance with local, State, and federal policies and regulations protecting these species.

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?

No Impact. There are no sensitive plant communities, including riparian habitat, and no designated critical habitat within the project area or surrounding 100-foot buffer. Therefore, there will be no impact on sensitive plant communities or critical habitats.

c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Less than Significant Impact with Mitigation Incorporated. The proposed project alignment intersects the following potentially jurisdictional waterways: Tejon Creek, Caliente Creek, East Side Canal, Arvin-Edison Canal, an unnamed agricultural drainage that runs parallel to Millux Road, an unnamed wetland area associated the unnamed drainage, two unnamed lakes used for groundwater recharge by the District, and multiple freshwater emergent ponds and wetlands excavated for agricultural purposes. The entire proposed pipeline installation alignment occurs along existing roads and previously disturbed areas and impacts to waterways should be minimal. Avoidance of potentially jurisdictional waterways is recommended, where feasible. Should avoidance of these waterways be unavoidable, then federal and/or State jurisdiction would be determined during a formal jurisdictional delineation performed by a qualified biologist. Impacts and specific mitigation measures would then be decided by agencies determined to have jurisdiction.

Mitigation Measures for Jurisdictional Waters and Wetlands

BIO-2 Jurisdictional Delineation: The Project shall be designed to avoid potentially jurisdictional aquatic features where feasible. If impacts to potentially jurisdictional features are unavoidable, the project proponent shall retain a qualified biologist to conduct a jurisdictional delineation to determine the extent of CDFW, USACE, and/or RWQCB jurisdiction. The delineation will be conducted in accordance with the requirements set forth by each agency. If the delineation determines that the project will result in impacts to a water of the State, then the project proponent shall submit an application to RWQCB for a Waste Discharge Requirements (WDR) permit and/or Section 401 Water Quality Certification (depending upon whether or not the feature also falls under federal jurisdiction). If the delineation determines that the project will result in impacts to features considered within CDFW's jurisdiction, then the project proponent will submit a Notification of Lake or Streambed Alteration Agreement pursuant to Section 1600 et seq. of the CFGC. If the delineation determines that the project will result in impacts to a water of the U.S., the project proponent shall submit a permit application to USACE, pursuant to Section 404 of the CWA. The project proponent shall abide by all permit conditions, and compensatory mitigation for all impacts to waters of the U.S., waters of the State and features subject to CDFW jurisdiction shall be completed at the ratio required in the applicable permits.

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?

No Impact. There are no wildlife movement corridors, or habitat linkages mapped within the BSA. The Project alignment overlaps with one Essential Connectivity Area (ECA) in the easternmost portion of the BSA (**Appendix B**). However, this overlap is small and no permanent impacts to wildlife movement corridors will result from Project activities. The region is dominated by agricultural production and subject to frequent disturbance which would impede or deter dispersal and migratory movements. Additionally, the proposed

alignment does not contain features, such as riparian vegetation, that are typically associated with wildlife movement corridors. Furthermore, Project activities do not include the placement of fencing or any other barriers to wildlife. No significant wildlife movement corridors exist within the Project area or surrounding 100-foot buffer and proposed project activities would not significantly impede wildlife movement. Therefore, there would be no impacts to wildlife movement due to project activities and no additional measures are recommended.

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

No Impact. No trees will be removed as a part of this project. The Project will be implemented in accordance with the goals and policies of the Kern County General Plan. There would be 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?

No Impact. The northern part of the Project area lies within the Metropolitan Bakersfield Habitat Conservation Plan (MBHCP). This Project does not require a discretionary development permit, and Project activities do not constitute covered activities under the MBHCP. Therefore, the proposed Project would not conflict with any Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or State Habitat Conservation Plan. There would be no impact.

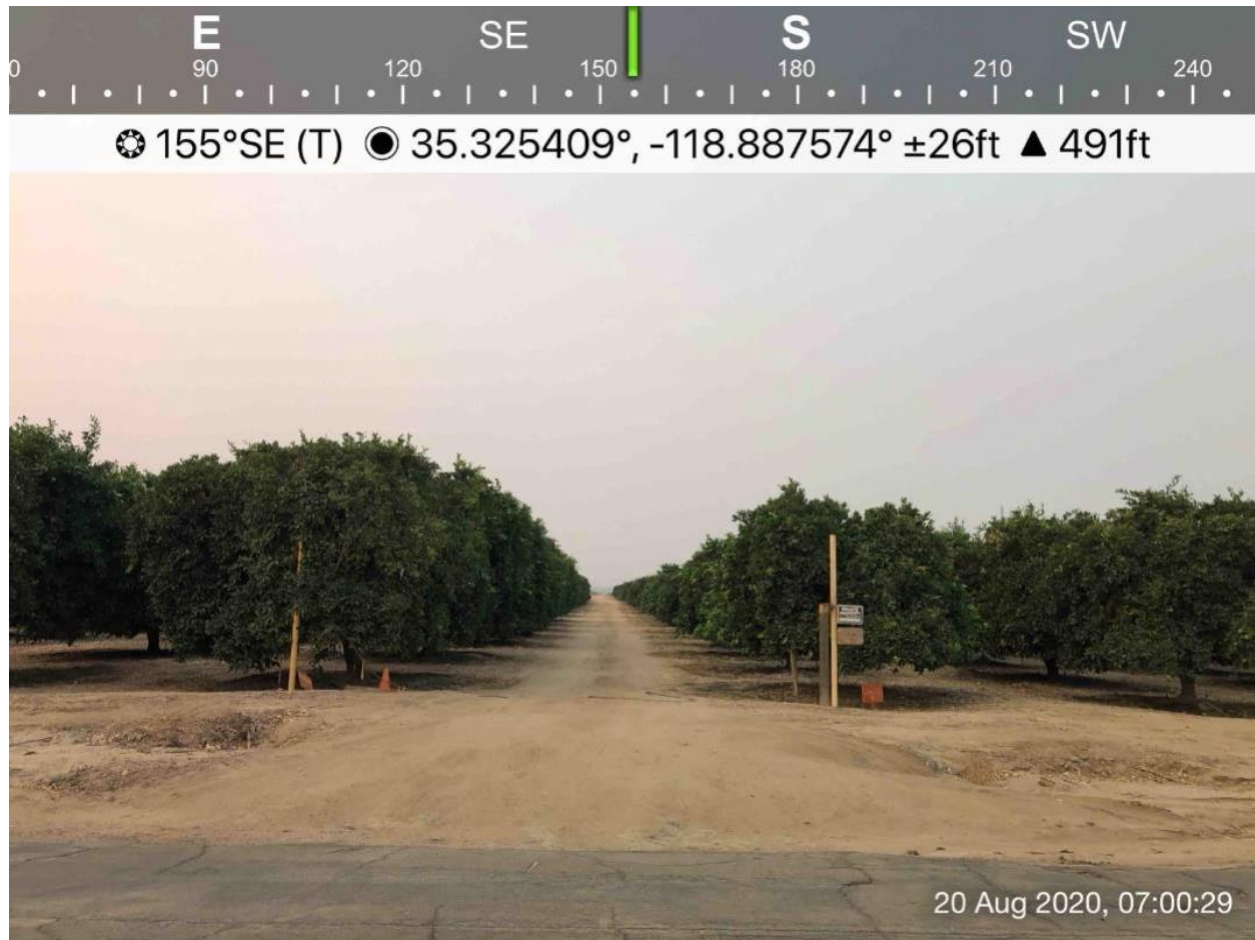


Figure 3-3. Photo 1

View across Muller Road of the northernmost portion of the proposed pipeline alignment. The alignment follows a compacted dirt access road within citrus orchards in this portion of the BSA.



Figure 3-4. Photo 2

View of the proposed pipeline alignment south of Muller Road. The alignment follows a compacted dirt access road between citrus orchards and sorghum fields in this portion of the BSA.

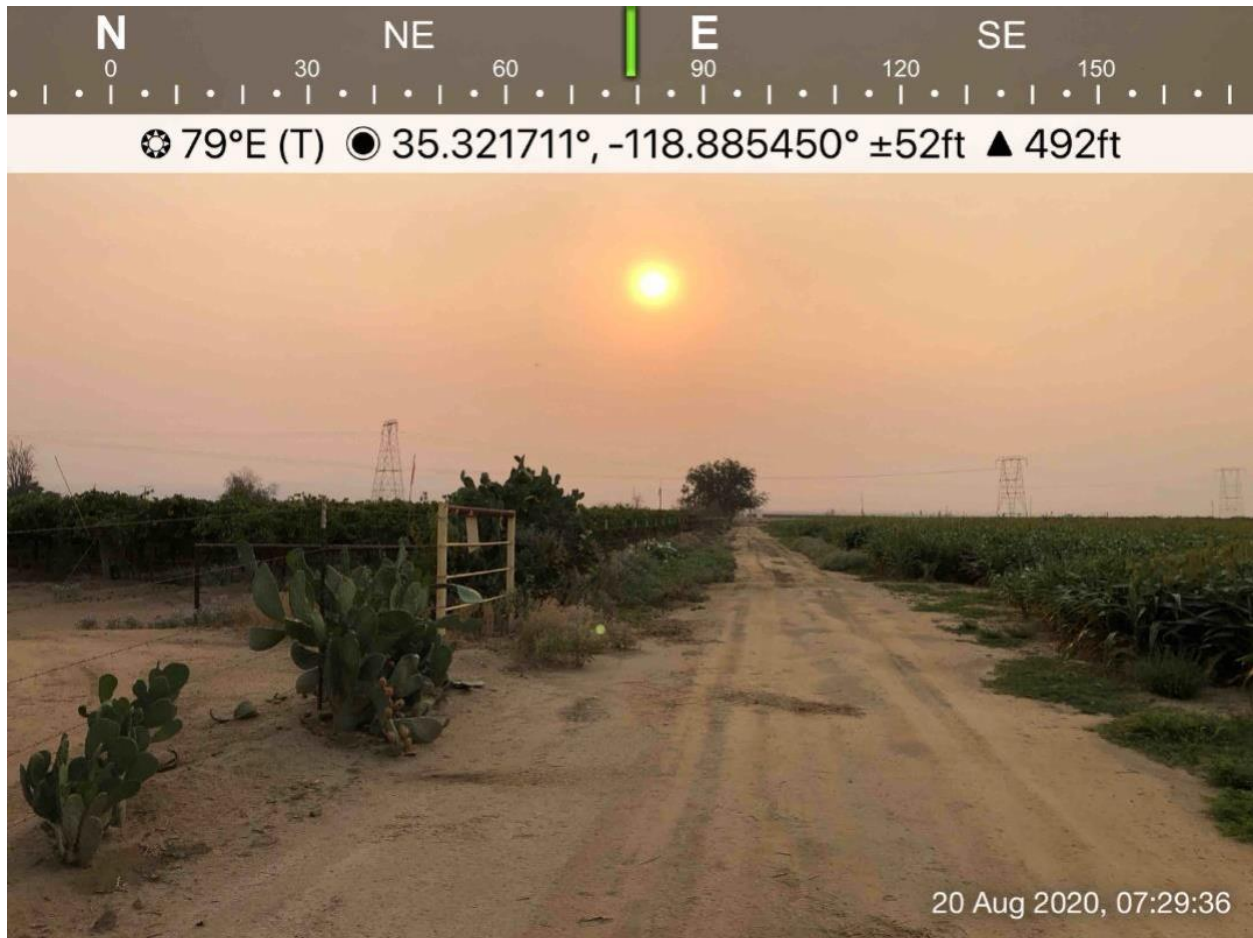


Figure 3-5. Photo 3

View of the proposed pipeline alignment in the northeastern portion of the BSA. Ruderal areas between cultivated orchards and fields could provide suitable habitat for some special-status species.



Figure 3-6. Photo 4

View of the proposed pipeline alignment along Teale Road, near the southwest corner of the BSA. Invasive

3.5 Cultural Resources

Table 3-11. Cultural Resources Impacts

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

3.5.1 Environmental Setting

The Project area lies within Kern County, which occupies an archeologically and historically rich part of the San Joaquin Valley.

3.5.2 Methodology

A Cultural Phase 1 Survey Report and Addendum was prepared for the Project area by ASM Affiliates, Inc (ASM) in January 2021. The original report covered 71.8 miles of proposed pipelines, manholes and turnouts. Subsequently the Project was redesigned covering only 44 miles, with less than a mile being an area that was not previously covered in the original survey and report. ASM has an obligation to report all findings from the original report to the Southern San Joaquin Valley Information Center (SSJVIC), therefore they provided two reports, the original and the addendum per the direction of Kern County. The impacts discussed in this section are directly related to the 44 miles included in the Project as it is designed today. But both the original report and the addendum are provided in **Appendix C** at the end of this document. The report and the addendum documents whether historic properties, as defined by NHPA Section 106, or historical resources, as defined by the CEQA Guidelines, which mandates that government agencies consider the impacts of their actions on the environment, including cultural resources. Impacts were analyzed using the methodologies listed below. Most of the analysis in this section comes entirely from the cultural resource inventory report which can be found in its entirety in **Appendix C** at the end of this document.

3.5.2.1 Records Search

At ASM's request, the SSJVIC of the CHRIS at California State University, Bakersfield, performed a records search on August 10, 2020, to identify previously recorded resources and prior surveys within the APE and surrounding 0.5-mile radius. SSJVIC staff completed searches of the Historic Property Data File, NRHP, CRHR, listings of California Historical Landmarks, California Inventory of Historic Resources, and the California Points of Historical Interest database (**Appendix C**).

3.5.2.2 Field Survey

The Phase I survey fieldwork was conducted in August, September and December 2020. The study area consists of up to 44-mi of proposed pipelines, manholes, turnouts, and other appurtenances with an added 50 foot

survey buffer on both sides of the pipeline route, resulting in a study area that is 860-ac. The study area was surveyed using parallel transects spaced at 15-m intervals along the pipeline routes.

A total of nine cultural resources (six previously recorded and three newly identified) were recorded during the survey. The six previously recorded resources include segments of Tejon Highway (P-15-003545), segments of the Arvin-Edison Canal (P-15-007994), a historic water well (P-15-020334), and segments of three transmission lines (P-15-017243, -017582, and -019115). The two newly identified resources include one historical water conveyance system and one isolated artifacts. All were given temporary field designations. The newly identified water conveyance system (AEWSD-RA-1) is a segment of Tejon Creek. ([Appendix C](#)).

3.5.3 Impact Assessment

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?

Less than Significant Impact with Mitigation Incorporated. A Phase I cultural resource survey was conducted for the re-designed AEWSD GWSA Pipeline Project, Kern County, California. This involved a pedestrian survey of approximately 44-mi of pipeline, manholes and turnouts representing a 533-ac study area. A records search was conducted at the Southern San Joaquin Valley Archaeological Information Center, California State University, Bakersfield. This indicated that 19 previous archaeological surveys had been completed that covered portions of the study area. An additional 24 previous archaeological surveys had been conducted within a 0.5-mi radius. The records search indicates that 6 cultural resources, all historical Euro-American structures, are known to exist within the study area, with an additional 17 cultural resources within 0.5-mi.

The survey fieldwork was conducted in August, September and December 2020, with parallel transects spaced at 15-meter intervals walked across the study area. A total of eight resources (six previously recorded and two newly identified) were recorded during the survey. The site records for the six previously recorded resources were updated during the survey. These include segments of Tejon Highway (P-15-003545), segments of the Arvin-Edison Canal (P-15-007994), a historic water well (P-15-020334), and segments of three transmission lines (P-15-017243, -017582, and -019115). The two newly identified resources recorded during the survey include one site and an isolated artifact, which were given temporary field designations. The newly identified site (AEWSD-RA-1) consists of a segment of Tejon Creek, while the isolated artifact (AEWSD-ISO-2) is a projectile point.

A full discussion regarding each of these resources can be found in Appendix C. Recommendations for the re-designed 44-mi pipeline Project area are as follows:

Tejon Highway (P-15-003545) – This contemporary road follows the original wagon route from Rose Station and the Tejon Ranch to Arvin. Although the creation and use of this route was associated with a significant historical event, the settlement of the southern San Joaquin Valley, and thus could qualify it for NRHP/CRHR eligibility under Criterion A/1, this is now an improved road that is regularly maintained by Kern County. Although it retains its location, it lacks integrity of design, materials, workmanship, setting, feeling and association. It is recommended as not NRHP/CRHR eligible under any criteria due to this loss of integrity. Construction on or within this resource therefore does not represent an adverse impact to a significant or unique cultural resource.

Arvin-Edison Canal (P-15-007994) - This resource was recorded and evaluated for NRHP/CRHR eligibility in 2015. This evaluation concluded that: “The AEWSD water delivery, recharge, and storage system does not appear to meet NRHP” eligibility under any of the four criteria (Smallwood et al. 2015:37-39). We concur with this recommendation. Construction on or within this resource therefore does not represent an adverse impact to a significant or unique cultural resource.

Big Creek Hydroelectric System Historic District (P-15007994, -017582 and -019115) - Segments of three previously recorded cultural resources within the Project area represent contributing elements of the BCHSHD, which was listed on the NRHP and CRHR in 2016, and thus represents a significant historical resource under CEQA. These three resources, however, are overhead transmission lines that cross the AEWSO pipeline route. Construction of the pipeline and its associated components will not materially affect these powerlines and will not result in adverse impacts to this historic district.

Kirschemann Water Well (P-15-020334) – This well, constructed circa 1956, was recorded in 2018 and recommended as not NRHP/CRHR eligible. We concur with that recommendation.

AEWSO-RA-1 (Tejon Creek) – This newly recorded cultural resource is an earthen canal that was constructed in the mid-twentieth century. It is not associated with an important historical event (Criterion A/1) or person (Criterion B/2), is a common property type that is not notable in terms of engineering, design, construction or materials (Criterion C/3), and does not have research potential (Criterion D/1). It is recommended as not NRHP/CRHR eligible.

AEWSO-ISO-2 - Isolated artifacts are categorically not NRHP/CRHR eligible and do not constitute significant or unique cultural resources.

Based on these assessments, the proposed AEWSO Project does not have the potential to result in adverse impacts to significant or unique historical resources or historic properties. No additional cultural resources work is recommended for this Project. However, in the unlikely event that cultural resources are encountered during Project construction or use, implementation of mitigation measure **CUL-1** would reduce impacts to less than significant.

Mitigation Measures:

CUL-1 (Archaeological Resources)

In the event that archaeological remains are encountered at any time during development or ground-moving activities within the entire project area, all work in the vicinity of the find shall halt until a qualified archaeologist can assess the discovery. The District shall implement all recommendations of the archaeologist necessary to avoid or reduce to a less than significant level potential impacts to cultural resource. Appropriate actions could include a Data Recovery Plan or preservation in place.

c) Disturb any human remains, including those interred outside of dedicated cemeteries?

Less than Significant Impact with Mitigation Incorporated. No formal cemeteries or other places of human internment are known to exist on the Project site; however, in accordance with Health and Safety Code Section 7050.5 and Public Resource Code Section 5097.98, if human remains are uncovered, Mitigation Measure CUL-3 would be implemented.

CUL-2 (Human remains)

If human remains are uncovered, or in any other case when human remains are discovered during construction, the Kern County Coroner is to be notified to arrange their proper treatment and disposition. If the remains are identified—on the basis of archaeological context, age, cultural associations, or biological traits—as those of a Native American, California Health and Safety Code 7050.5 and Public Resource Code 5097.98 require that the coroner notify the NAHC within 24 hours of discovery. The NAHC would then identify the Most Likely Descendent who would determine the manner in which the remains are treated.

3.6 Energy

Table 3-12. Energy Impacts

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

3.6.1 Environmental Setting

PG&E and Southern California Gas are the primary energy utility purveyors and distributors within Kern County and near AEWS. PG&E and Southern California Gas have sufficient energy supplies to supply the growth that has occurred in Kern County. Much of the energy consumed in the region is for agriculture, residential, commercial, and transportation purposes.

Construction equipment and construction worker vehicles operated during Project excavation and construction would use fossil fuels. This increased fuel consumption would be temporary and would cease at the end of the construction activity, and it would not have a residual requirement for additional energy input. The marginal increases in fossil fuel use resulting from Project construction are not expected to have appreciable impacts on energy resources.

3.6.2 Impact Assessment

a) Would the project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation? And;

b) Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

No Impact. Operation of the Project would directly consume a negligible amount of energy. Thus, energy use during operation would be similar to, or less than, existing conditions. Construction of the Project would require energy use, but this use would not be wasteful or inefficient, nor would it require significant electric power or natural gas facilities. Energy used during construction would allow the operation of the multi-use path, which, as discussed above, could result in a reduction of long-term energy use. No features of the Project would conflict with or obstruct state or local plans for renewable energy or energy efficiency. The Project would not require the relocation or construction of new or expanded electric power or natural gas facilities. The impact on energy use and energy plans would be less than significant.

3.7 Geology and Soils

Table 3-13. Geology and Soils Impacts

Geology and Soils				
Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☐	☒
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the most recently adopted Uniform Building Code creating substantial direct or indirect risks to life or property?	☐	☐	☐	☒
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?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐

3.7.1 Environmental Setting

The Project is located in the south-central region of Kern County, in the southern section of California's Great Valley Geomorphic Province, or Central Valley. The Sacramento Valley makes up the northern third and the San Joaquin Valley makes up the southern two-thirds of the geomorphic province. Both valleys are watered by large rivers flowing west from the Sierra Nevada Range, with smaller tributaries flowing east from the Coast Ranges. Most of the surface of the Great Valley is covered by Quaternary (present day to 1.6 million years ago) alluvium. The sedimentary formations are steeply upturned along the western margin due to the uplifted Sierra

Nevada Range.⁶ From the time the Valley first began to form, sediments derived from erosion of igneous and metamorphic rocks and Fresno marine sediments in the surrounding mountains have been transported into the Valley by streams.

Using the USDA NRCS soil survey of the Project area, an analysis of the soils onsite was performed (**Appendix B**). 17 soil units were mapped within the Project area, but only five of these soil types underlie the majority of the area within the Project area: Granoso loamy sand, 0 to 2 percent slopes; Granoso loamy sand, loamy substratum, 0 to 2 percent slopes; Delano sandy loam, 0 to 2 percent slopes; Hesperia sandy loam, 0 to 2 percent slopes; and Kimberlina fine sandy loam, 0 to 2 percent slopes MLRA 17. Of the 17 soils mapped within the BSA, ten are on the National Hydric Soils List (**Appendix B**). Hydric soils can occur in wetlands or other areas with surface or groundwater and may provide habitat for hydrophytic plants, though these soils may also occur in upland areas. The proposed pipeline alignment runs through agriculture areas and roadsides and would occur primarily on non-native fill. **Table 3-14** describes each of the 17 soil units found within the Project area.

Table 3-14. Soils of the Project area

Soils Series	Parent Material	Drainage Class	Hydric?
Bakersfield fine sandy loam, drained, 0 to 1 percent slopes	Alluvium derived from granitoid rock	Somewhat poorly drained	Yes
Granoso loamy sand, 0 to 2 percent slopes	Alluvium derived from mixed rock sources	Somewhat excessively drained	Yes
Granoso loamy sand, loamy substratum, 0 to 2 percent slope	Alluvium derived from mixed rock sources	Somewhat excessively drained	Yes
Granoso sandy loam, 0 to 2 percent slopes, overwash	Alluvium derived from mixed rock sources	Somewhat excessively drained	Yes
DiGiorgio sandy clay loam, 0 to 2 percent slopes	Alluvium derived from granite	Well drained	No
Cerini loam, 0 to 2 percent slopes	Alluvium derived from granitoid rock	Well drained	No
Delano sandy loam, 0 to 2 percent slopes	Alluvium derived from granite	Well drained	No
Hesperia sandy loam, 0 to 2 percent slopes	Alluvium derived from granitoid	Well drained	Yes
Hesperia sandy loam, 0 to 2 percent slopes	Alluvium derived from granitoid	Well drained	Yes
Kimberlina fine sandy loam, 0 to 2 percent slopes MLRA 17	Alluvium derived from igneous and sedimentary rock	Well drained	Yes
Hesperia loamy sandy, 0 to 2 percent slopes	Alluvium derived from granitoid	Well drained	Yes
Hesperia sandy loam, 0 to 2 percent slopes	Alluvium derived from granitoid	Well drained	Yes

⁶ Harden, D.R. 1998, California Geology, Prentice Hall, 479 pages

Soils Series	Parent Material	Drainage Class	Hydric?
Whitewolf loamy sand, 2 to 5 percent slopes	Alluvium derived from granite	Somewhat excessively drained	No
Kimberlina fine sandy loam, 0 to 2 percent slopes MLRA 17	Alluvium derived from igneous and sedimentary rock	Well drained	No
Wasco sandy loam	Alluvium derived from granite	Well drained	No
Whitewolf coarse sandy loam, 0 to 2 percent slopes	Alluvium derived from granitoid rock	Somewhat excessively drained	No
Vineland-Bakersfield complex, 0 to 1 percent slopes, drained	Alluvium derived from granitoid rock	Somewhat excessively drained	Yes

3.7.1.1 Faults and Seismicity

The Project area is not located within an Alquist-Priolo Earthquake Fault Zone and no named faults cut through the local soil at the proposed pipeline locations. The nearest major fault is the Garlock Fault, located approximately 16 miles southeast of the Project area. A smaller fault zone, the White Wolf Fault is approximately one mile east/southeast of the area.

3.7.1.2 Liquefaction

Seismic ground shaking of relatively loose, granular soils that are saturated or submerged can cause the soils to liquefy and temporarily behave as a dense fluid. Liquefaction is caused by a sudden temporary increase in pore water pressure due to seismic densification or other displacement of submerged granular soils. According to the Kern County General Plan Update Environmental Impact Report, the soil formations throughout much of Kern County, are comprised of thick, unconsolidated, coarse-textured alluvial sediments composed of gravel, sand and silt of granitic composition. Due to the great depth to groundwater in the desert area, liquefaction does not present a major potential hazard within the Kern County area.⁷

3.7.1.3 Soil Subsidence

Subsidence occurs when a large land area settles due to over-saturation or extensive withdrawal of ground water, oil, or natural gas. These areas are typically composed of open-textured soils that become saturated. These areas are high in silt or clay content. The Project area is comprised of many soil types, as shown in the table below. These soils are mostly well drained to excessively well drained

3.7.1.4 Dam and Levee Failure

Lake Isabella is located approximately 35 miles northeast of the Project area. According to the Kern County General Plan DEIR⁸, the area is outside of the inundation zone for Lake Isabella.

⁷ Kern County Revised General Plan Update. Recirculated Draft Program EIR. January 2004. Page 4-I-8.

⁸ Kern County DEIR. [Kern County General Plan Revised Program EIR - Volume 1, Chapters 1-8](#) Accessed January 2021.

3.7.2 Impact Assessment

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

a-i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

No Impact. The Project area is not located within an Alquist-Priolo Earthquake Fault Zone and no named faults cut through the local soil at the proposed pipeline locations. There would be no impact.

a-ii) Strong seismic ground shaking?

No Impact. The Alquist-Priolo Fault Zone maps show two named faults within close proximity to the Project area: the White Wolf Fault about one mile to the east/southeast and the Garlock Fault about 16 miles to the Southeast; however, the proposed facilities are subject to seismic activity from the faults in and around the Districts, as are the existing facilities. To minimize or eliminate the possibility of structural damage, the Project elements would be designed and constructed in accordance with accepted engineering standards and methods. The basic design of the Project would follow the design successfully used for existing facilities, including earth berms and control structures. No habitable structures will be built as part of this Project. As a result, the Project would not result in or expose people to potential additional impacts involving seismic shaking. There would be no impact.

a-iii) Seismic-related ground failure, including liquefaction?

No Impact. Seismic-related ground failures, such as ruptures, lateral spreading, ground lurching, seiches, or mudslides, are unlikely to occur in the Project area because of its relatively stable geologic formation and distance to active faults. Because the Project area is generally level and does not involve the construction of any habitable structures, the Project would not expose people or structures to potential substantial effects associated with seismic-related ground failure, including liquefaction. Therefore, there will be no impact.

a-iv) Landslides?

No Impact. No geologic landforms exist on or near the site that would result in a landslide event. The surrounding topography is very flat. There would be no impact.

b) Result in substantial soil erosion or the loss of topsoil?

No Impact. The Project will involve excavation work in order to place the pipelines throughout the District. However, it is anticipated that most of these pipelines will be covered. Soil usage will be balanced on site, with no export or import of soil. The redistribution of material will not result in additional erosion or loss of material, therefore there will be no impact.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

No Impact. Substantial grade change would not occur in the topography to the point where the Project would expose people or structures to potential substantial adverse effects on, or offsite, such as landslides, lateral spreading, subsidence, liquefaction or collapse. All of the pipelines would be underground upon completion of construction. There would be no impact.

d) Be located on expansive soil, as defined in Table 18-1-B of the most recently adopted Uniform Building Code creating substantial direct or indirect risks to life or property?

No Impact. The Project does not include the development of structures or facilities that could be affected by expansive soils or expose people to substantial risks to life or property. Furthermore, the Project would be consistent with the California Building Standards Code. There would be no impact.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

No Impact. The Project does not include the use of septic tanks or other alternative waste water disposal system. There would be no impact.

f) Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Less than Significant Impact. Paleontological resources are fossilized remains of flora and fauna and associate deposits. CEQA requires that a determination be made as to whether a project would directly or indirectly destroy a unique paleontological resource or site or unique geological feature (CEQA Appendix G(v)(c)). If an impact is significant, CEQA requires feasible measures to minimize the impact (CCR Title 14(3) Section 15126.4(a)(1)). PRC Section 5097.5 (see above) also applies to paleontological resources.

Unique paleontological resources or sites or unique geological features have not been identified in the Project area. Therefore impacts would be less than significant.

3.8 Greenhouse Gas Emissions

Table 3-15. Greenhouse Gas Emissions Impacts

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

3.8.1 Environmental Setting

The Earth's climate has been warming for the past century. Experts believe this warming trend is related to the release of certain gases into the atmosphere. Greenhouse gases (GHG) absorb infrared energy that would otherwise escape from the Earth. As the infrared energy is absorbed, the air surrounding the Earth is heated. An overall warming trend has been recorded since the late 19th century, with the most rapid warming occurring over the past 35 years, with 16 of the 17 warmest years on record occurring since 2001. Not only was 2016 the warmest year on record, but eight of the 12 months that make up the year—from January through September, with the exception of June—were the warmest on record for those respective months. October, November, and December of 2016 were the second warmest of those months on record—in all three cases, behind records set in 2015.⁹ Human activities have been attributed to an increase in the atmospheric abundance of greenhouse gases. The following is a brief description of the most commonly recognized GHGs.

3.8.1.1 Greenhouse Gases

Carbon dioxide (CO₂) is an odorless, colorless natural greenhouse gas. CO₂ is emitted from natural and anthropogenic sources. Natural sources include the following: decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic out gassing. Anthropogenic sources include the burning of coal, oil, natural gas, and wood.

Methane (CH₄) is a flammable greenhouse gas. A natural source of methane is the anaerobic decay of organic matter. Geological deposits, known as natural gas fields, also contain methane, which is extracted for fuel. Other sources are from landfills, fermentation of manure, and ruminants such as cattle.

Nitrous oxide (N₂O), also known as laughing gas, is a colorless greenhouse gas. Nitrous oxide is produced by microbial processes in soil and water, including those reactions that occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load.

⁹ NASA, NOAA Data Show 2016 Warmest Year on Record Globally. <https://www.nasa.gov/press-release/nasa-noaa-data-show-2016-warmest-year-on-record-globally>. January 18, 2017. Accessed 14 February 2020.

Water vapor is the most abundant, and variable greenhouse gas. It is not considered a pollutant; in the atmosphere, it maintains a climate necessary for life.

Ozone (O₃) is known as a photochemical pollutant and is a greenhouse gas; however, unlike other greenhouse gases, ozone in the troposphere is relatively short-lived and, therefore, is not global in nature. Ozone is not emitted directly into the atmosphere but is formed by a complex series of chemical reactions between volatile organic compounds, nitrogen oxides, and sunlight.

Aerosols are suspensions of particulate matter in a gas emitted into the air through burning biomass (plant material) and fossil fuels. Aerosols can warm the atmosphere by absorbing and emitting heat and can cool the atmosphere by reflecting light.

Chlorofluorocarbons (CFCs) are nontoxic, nonflammable, insoluble, and chemically unreactive in the troposphere (the level of air at the earth's surface). CFCs were first synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. CFCs destroy stratospheric ozone; therefore, their production was stopped as required by the Montreal Protocol in 1987.

Hydrofluorocarbons (HFCs) are synthetic chemicals that are used as a substitute for CFCs. Of all the greenhouse gases, HFCs are one of three groups (the other two are perfluorocarbons and sulfur hexafluoride) with the highest global warming potential. HFCs are human-made for applications such as air conditioners and refrigerants.

Perfluorocarbons (PFCs) have stable molecular structures and do not break down through the chemical processes in the lower atmosphere; therefore, PFCs have long atmospheric lifetimes, between 10,000 and 50,000 years. The two main sources of PFCs are primary aluminum production and semiconductor manufacture.

Sulfur hexafluoride (SF₆) is an inorganic, odorless, colorless, nontoxic, nonflammable gas. It has the highest global warming potential of any gas evaluated. Sulfur hexafluoride is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

3.8.1.2 Effects of Climate Change

The impacts of climate change have yet to fully manifest. A hotter planet is causing the sea level to rise, disease to spread to non-endemic areas, as well as more frequent and severe storms, heat events, and air pollution episodes. Also affected are agricultural production, the water supply, the sustainability of ecosystems, and therefore the economy. The magnitude of these impacts is unknown.

Emissions of GHGs contributing to global climate change are largely attributable to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors. GHG emissions are typically expressed in carbon dioxide-equivalents (CO₂e), based on the GHG's Global Warming Potential (GWP). The GWP is dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. For example, one ton of CH₄ has the same contribution to the greenhouse effect as approximately 21 tons of CO₂. Therefore, CH₄ is a much more potent GHG than CO₂.

3.8.2 Methodology

An Air Quality and Greenhouse Gas Emissions Evaluation Report (**Appendix A**) was prepared in October 2020. The sections below detail the methodology of the report and its conclusions.

3.8.2.1 Short-Term Construction-Generated Emissions

Short-term construction emissions associated with the Project were calculated using CalEEmod, Version 2016.3.2. Emissions' modeling was assumed to occur over an approximate 24 month period and covering a site area of approximately 44 miles of pipeline (approximately 267 acres). Remaining assumptions were based on the default parameters contained in the model. Modeling assumptions and output files are included in **Appendix A**.

3.8.2.2 Long-Term Operational Emissions

Long-term operational emissions associated with the Project are estimated to be minimal in nature. Any necessary maintenance would take place during the Districts current maintenance schedule and would not require special trips. The project may use flow meters at five locations. The electrical usage for this would be minimal resulting in less than 56 kW/hrs per year. Modeling assumptions and output files are included in **Appendix A**.

3.8.3 Impact Assessment

3.8.3.1 Thresholds of Significance

In accordance with SJVAPCD's *CEQA Greenhouse Gas Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects*¹⁰, proposed projects complying with Best Performance Standards (BPS) would be determined to have a less-than-significant impact. Projects not complying with BPS would be considered less than significant if operational GHG emissions would be reduced or mitigated by a minimum of 29 percent, in comparison to business-as-usual (year 2004) conditions. In addition, project-generated emissions complying with an approved plan or mitigation program would also be determined to have a less-than-significant impact.

Bay Area Air Quality Management District's Thresholds for Significance: Bay Area Air Quality Management District's approach to developing a threshold of significance for GHG emissions is to identify the emissions level for which a project would not be expected to substantially conflict with existing California legislation adopted to reduce Statewide GHG emissions. If a project would generate GHG emissions above the threshold level, it would be considered to contribute substantially to a cumulative impact, and would be considered significant. If mitigation can be applied to lessen the emissions such that the project meets its share of emission reductions needed to address the cumulative impact, the project would normally be considered less than significant. Although the proposed Project is not located in the Bay Area, the Bay Area Air Quality Management District's thresholds for significance are based on the Statewide AB 32 objectives, are scientifically supported and are more appropriate to assess potential impacts related to GHG emissions. For land use development projects, the threshold is compliance with a qualified GHG Reduction Strategy or annual emissions less than 1,100 metric tons per year (MT/yr) of CO₂e. For stationary source projects, such as those requiring a permit from a local air district to operate, the threshold is 10,000 MT/yr of CO₂e. Although the BAAQMD thresholds are generally intended for ongoing sources of emissions (e.g., manufacturing facilities, refineries), their use in CEQA is appropriate for construction projects that occur over a relatively short period and contribute a relatively low total amount of GHGs, as compared to a land use development project that would generate substantial annual emissions indefinitely.

¹⁰ Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA. <http://www.valleyair.org/Programs/CCAP/12-17-09/3%20CCAP%20-%20FINAL%20LU%20Guidance%20-%20Dec%2017%202009.pdf> Accessed September 2020

- a) Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? And;
- b) Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Less than Significant Impact.

Short-Term Construction-Generated Emissions

Estimated construction-generated emissions are summarized in **Table 3-16**. As indicated, construction of the Project would generate a total of 905.2172 MT_{CO₂e} over several years of construction. These emissions are totaled and amortized over 30 years and added to the operational emissions in **Table 3-17** below.

Table 3-16. Short-Term Construction-Generated GHG Emissions

Year	Emissions (MT CO ₂ e) ⁽¹⁾
2022	414.3637
2023	428.4677
2024	62.3858
Amortized over 30 years	30.17

1. Emissions were quantified using the CalEEMod, Version 2016.3.2. Refer to **Appendix A** for modeling results and assumptions. Totals may not sum due to rounding.

Long-Term Operational Emissions

Estimated long-term operational emissions are summarized in **Table 3-17**.

Table 3-17. Long-Term Operational GHG Emissions

	Emissions (MT CO ₂ e) ⁽¹⁾
Estimated Annual Operation CO ₂ e Emissions	0.014
Amortized Construction Emissions	30.17
Total Estimated Annual Operational CO ₂ e Emissions	30.19
AB 32 Consistency Threshold for Land-Use Development Projects*	1,100
Exceed Threshold?	No

1. Emissions were quantified using the CalEEMod, Version 2016.3.2. Refer to **Appendix A** for modeling results and assumptions. Totals may not sum due to rounding.

* As published in the Bay Area Air Quality Management District's CEQA Air Quality Guidelines. Available online at http://www.baaqmd.gov/~media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en Accessed September 2020.

The District does not have an adopted GHG plan or MT/yr thresholds for CO₂e. The San Joaquin Valley Air Pollution Control District (SJVAPCD) CEQA guidance for GHG emissions recommends that a project not be considered to have a significant impact if it complies with an applicable air quality plan, results in a 29% reduction from business as usual (BAU) GHG emissions (2004 levels), or implements applicable Best Performance Standards (BPS). The SJVAPCD metrics (reduction from BAU, implementation of BPS) are not appropriate for this Project. The thresholds provided by the Bay Area Air Quality Management District, while not in our area, are very stringent and based on Statewide AB 32 objectives. Because they are designed to avoid significant impacts from global climate change, which occurs at a global scale, they do not depend on site-specific characteristics. The District has determined that the Bay Area Air Quality Management District's

thresholds are the most appropriate threshold for this Project, which has predominantly short-term construction emissions, and extremely low operational emissions (30.19 CO₂e). Any impacts would be less than significant.

3.9 Hazards and Hazardous Materials

Table 3-18. Hazards and Hazardous Materials Impacts

Hazards and Hazardous Materials				
Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
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 or excessive noise for people residing or working in the project area?	☐	☐	☐	☒
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g) Expose people or structures, either directly or indirectly to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☒

3.9.1 Environmental Setting

3.9.1.1 Hazardous Materials

The Hazardous Waste and Substances Sites (Cortese) List is a planning document used by the State, local agencies, and developers to comply with CEQA requirements in providing information about the location of hazardous materials release sites. Government Code (GC) Section 65962.5 requires the California Environmental Protection Agency (CalEPA) to develop at least annually an updated Cortese List. The Department of Toxic Substances Control (DTSC) is responsible for a portion of the information contained in the Cortese List. Other State and local government agencies are required to provide additional hazardous material release information for the Cortese List. DTSC's EnviroStor database provides DTSC's component of Cortese List data (DTSC, 2010). In addition to the EnviroStor database, the State Water Resources Control Board (SWRCB) Geotracker database provides information on regulated hazardous waste facilities in California, including underground storage tank (UST) cases and non-UST cleanup programs, including Spills-Leaks-Investigations-Cleanups (SLIC) sites, Department of Defense (DOD) sites, and Land Disposal program.

A search of the DTSC EnviroStor database and the SWRCB Geotracker performed on January 17, 2021 determined that there are no known active hazardous waste generators or hazardous material spill sites within the Project area or immediate surrounding vicinity.

1.1.1.1 Airports

The Bakersfield Municipal Airport is located approximately five miles west, and the Creekside Water Ski Community airstrip is approximately 1.2 miles west of the Project.

1.1.1.2 Sensitive Receptors

Rural residences are scattered along the 44 miles of project pipeline proposed.

3.9.2 Impact Assessment

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? and;

No Impact. There would be no transport, use or disposal of hazardous materials associates with Project construction or operation. There would be no impact.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

No Impact. The Project would not create a significant hazard to the public or the environment as the Project would not discharge hazardous materials into the environment. Furthermore, construction activities will require implementation of a SWPPP and compliance with all Cal/OSHA regulations in order to reduce the potential for accidental release of hazardous substances into the environment. There would be no impact.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

No Impact. There are school sites within one mile of various segments of proposed pipeline. The Project does not involve any toxic chemicals, would not emit hazardous emissions, involve hazardous materials, or create a hazard to the schools in any way. There would be no impact.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

No Impact. The Project does not involve land that is listed as a hazardous materials site pursuant to Government Code Section 65962.5 and is not included on a list compiled by the Department of Toxic Substances Control. There would be no impact.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?

No Impact. The Project does not involve the construction of any habitable structures, therefore the Project would not result in a safety hazard for people residing or working in the Project area. There would be no impact.

f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

No Impact. The vast majority of proposed pipeline alignments will be installed on private agricultural property parallel to existing public county road right of way or along existing private dirt farm roads between fields/orchards using the traditional cut-and-cover construction method. Short segments of the proposed pipelines will cross public county road right of way and may require an encroachment permit from Kern

County. If Kern County requires through traffic during pipeline construction, some of these short pipeline segments may be constructed using the jack and bore construction method. The Project would not interfere with implementation of an emergency response plan or evacuation plan. There would be no impact.

g) Expose people or structures, either directly or indirectly to a significant risk of loss, injury or death involving wildland fires?

No Impact. The Project area and the surrounding lands are in agricultural, recreational, or rural residential uses and are not considered wildlands. The Project area is not located in any wildland fire areas. The Project also does not propose the construction of any habitable structures. The impact would be no impact.

3.10 Hydrology and Water Quality

Table 3-19. Hydrology and Water Quality Impacts

Hydrology and Water Quality				
Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	☐	☒
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i) result in substantial erosion or siltation on- or off-site;	☐	☐	☐	☒
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or offsite;	☐	☐	☐	☒
iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☐	☒
iv) impede or redirect flood flows?	☐	☐	☐	☒
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	☒

3.10.1 Environmental Setting

Water resources in Kern County include many natural rivers and streams, man-made surface water conveyance structures, and groundwater. Kern County's groundwater and surface water management is accomplished through various combinations of public and private water entities, including the Bureau of Reclamation, water utility companies, and local irrigation districts, all of which are governed by State and federal regulations.

Like most of California, the San Joaquin Valley experiences a Mediterranean climate. Warm, dry summers are followed by cool, moist winters. Summer temperatures often reach above 90 degrees Fahrenheit, and the humidity is generally low. Winter temperatures are often below 60 degrees Fahrenheit during the day and rarely exceed 70 degrees. The Central Valley receives an average of 12 inches of precipitation in the form of rainfall yearly, most of which occurs between October and March.

The Project is located in the Central Valley region of the State Water Resource Board. According to the U.S. Geological Survey (USGS) classification system, the Project is located within the Middle Kern-Upper Tehachapi

watershed; Hydrologic Unit Code (HUC): 18030003, and spans three sub-watersheds: Lake Paulina (HUC 180300030604), Kern Island Canal-Frontal Kern Lake Bed (HUC 180300031201), and Caparell Creek-Frontal Kern Lake Bed (HUC 180300031000) ¹¹ The Project area lies entirely within the Kern Groundwater Subbasin of the San Joaquin Valley Groundwater Basin.¹²

3.10.2 Impact Assessment

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

No Impact. The State Water Resources Control Board (SWRCB) requires that a Storm Water Pollution Prevention Plan (SWPPP) be prepared for projects that disturb one or more acres of soil. A SWPPP involves site planning and scheduling, limiting disturbed soil areas, and determining best management practices to minimize the risk of pollution and sediments being discharged from construction sites. Implementation of the SWPPP would minimize the potential for the Project to substantially alter the existing drainage pattern in a manner that would result in substantial erosion or siltation onsite or offsite.

The Project would not violate any water quality standards and would not impact waste discharge requirements. Furthermore, construction activities will require implementation of a SWPPP and compliance with all Cal/OSHA regulations in order to reduce the potential for accidental release of pollutants or hazardous substances into surface water or groundwater. There would be no impact.

b) Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project would impede sustainable groundwater management of the basin?

No Impact. The Project area is located in the Kern County basin of the Tulare Lake Region, an area significantly affected by overdraft. The Project would involve the expansion of Temporary Water Service Contracts as it would provide more landowners access to the District's wet period surface water. This would allow more landowners to utilize surface water from the District and would help to reduce groundwater pumping and consequently assist in stabilizing the groundwater table. As a result the net change in groundwater recharge potential surrounding the Project area would be positive. The pipelines would provide a benefit to groundwater with additional recharge. There would be no impact.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

c-i) result in substantial erosion or siltation on- or off-site;

c-ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or offsite;

c-iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or

c-iv) impede or redirect flood flows?

No Impact. Drainage patterns would not change as a result of Project build out. The Project will not alter the run-off from the surrounding areas. There would be no impact.

¹¹ Appendix B. Biological Resources Assessment. December 2020.

¹² DWR Bulletin 118 Groundwater Basin Boundary Assessment Tool. <https://water.ca.gov/Programs/Groundwater-Management/Bulletin-118> Accessed January 2021.

d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

No Impact. The Project is not located in an area at risk of tsunami or seiche. According to the Federal Emergency Management Agency (FEMA) National Flood Insurance Program (NFIP) Flood Insurance Rate Map (FIRM) for Community Number 06029C2325E, 06029C2350E, 06029C2775E, 06029C2750E, and 06029C3150E dated September 26, 2008, portions of the proposed pipeline is located within the 100 Year Flood Zone (see **Figure 3-7**); however the construction of housing or habitable structures is not a part of the proposed Project and there are no homes or offices in the immediate Project area. There would be no impact.

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

No Impact. Since the Project will be providing better access to surface water to landowners throughout the District, it will reduce groundwater pumping. The effect on groundwater levels and quality in the area is expected to be improved. There would be no impact.

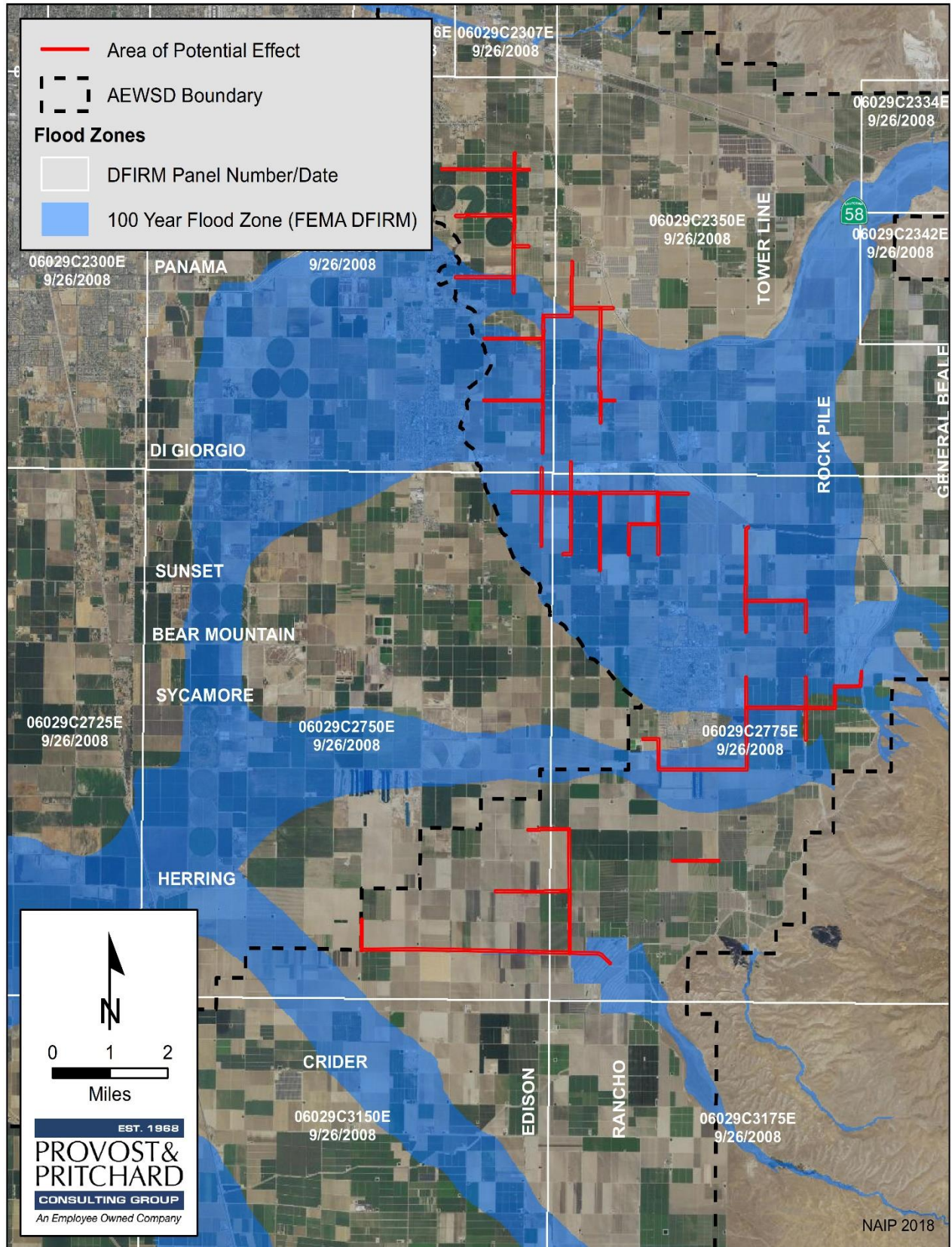


Figure 3-7. FEMA Flood Map

3.11 Land Use and Planning

Table 3-20. Land Use and Planning Impacts

Land Use and Planning				
Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

3.11.1 Environmental Setting

The Project is located within an unincorporated area of central Kern County. Up to 44 miles of pipeline are scattered throughout rural areas south of Bakersfield (**Figure 2-1**). The Project area is surrounded by agricultural lands, sparse rural residences, one City of Arvin neighborhood, and local water infrastructure.

The majority of the Project is located within land zoned AE-20 (Exclusive Agriculture, 20-Acre minimum), by Kern County. The Kern County General Plan Land Use Map designates this area as Agriculture. All adjacent properties are similar zoning and General Plan designations. The segments of the Project that are located within the City of Arvin are zoned or adjacent to M-2 (Light Manufacturing), M-3 (General Manufacturing), R-1 (One-Family), R-4 (Multi-Family), C-1 (Restricted Commercial), A-1 (Light Ag), A-2 (General Ag) (See **Figure 3-9**).

3.11.2 Impact Assessment

a) Would the project physically divide an established community?

No Impact. The Project is located in an agricultural setting in the southeastern portion of the San Joaquin Valley. The Project pipelines will all be underground and therefore would not physically divide any established community. There would be no impact.

b) Would the project cause a significant environmental conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

No Impact. The Project involves the construction and operation of underground pipelines for transport of surface water for irrigation and/or recharge purposes which is consistent with the land use within the vicinity. Therefore, the Project would not conflict with any applicable plans, policies, or regulations. There would be no impact.

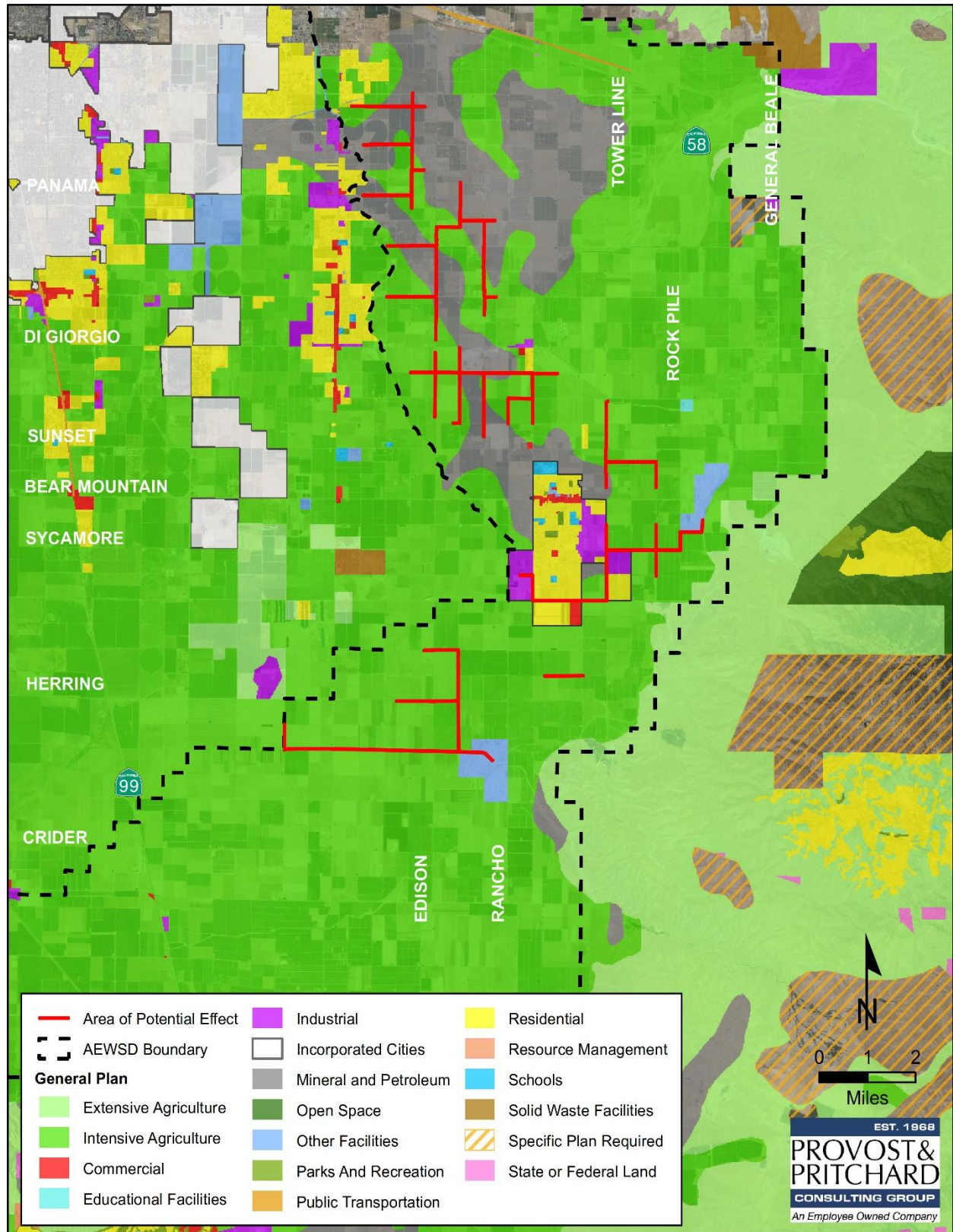


Figure 3-8. Kern County General Plan Land Use Designation Map

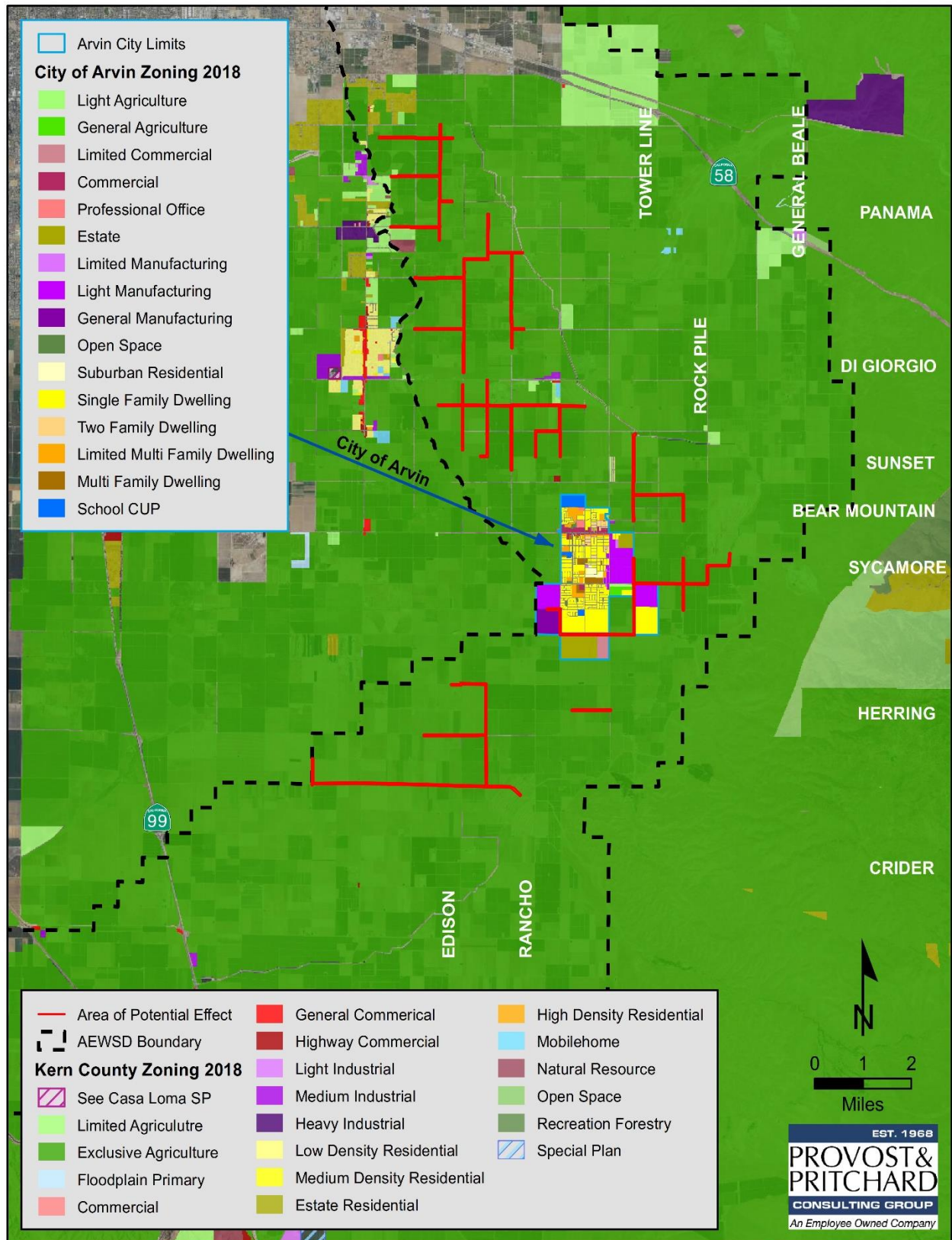


Figure 3-9. Kern County Zoning Map

3.12 Mineral Resources

Table 3-21. Mineral Resources Impacts

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

3.12.1 Environmental Setting

Kern County is one of the largest producers of mineral products in California with a production value of almost one-quarter of the State's total. The principal mineral product is petroleum (an organic derivative material) and related products, which contributes about 75% of the total valuation of all County mineral products. The remainder is comprised of borax, cement products, sand and gravel, and other construction and gem-like minerals¹³.

California Department of Conservation's Division of Oil, Gas, and Geothermal Resources maintains a database of oil wells in the Project area (DOGGR). According to the DOGGR Well Finder there oil 112 wells within two hundred feet of the Project area, 19 are listed as active. There are no active wells within the Project area.

There are no known current or historic mineral resource extraction or recovery operations in the Project area nor are there any known significant mineral resources onsite.

3.12.2 Impact Assessment

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?

No Impact. The Kern County General Plan (2004) includes a Land Use/Conservation/Open Space Element (Chapter 1), which identifies Mineral and Petroleum areas (Map Code 8.4) that contain "productive petroleum fields, natural gas, geothermal resources and mineral deposits of regional and statewide importance". According to the map, the Project area is not located in a Mineral Resource Zone. The Project would not result in the loss of an known available mineral resource. There would be no impact.

b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

No Impact. The California Surface Mining and Reclamation Act of 1975 (SMARA) was created to address protecting the state's need for a continuing supply of mineral resources, while protecting public an environmental health. SMARA requires that all cities incorporate into their general plans mapped mineral resource designations approved by the State Mining and Geology Board. The State Geologist classifies land in California based on availability of mineral resources. Because available aggregate construction material is limited, five designations have been established for the classification of sand, gravel and crushed rock resources:

¹³ Kern County DEIR, Section 4.8. [Kern County General Plan Revised Program EIR - Volume 1, Chapters 1-8](#) Accessed January 2021.

Scientific Resource, Mineral Resource Zone 1, Mineral Resources Zone 2, and Mineral Resource Zone 3, and Mineral Resource Zone 4.

According to the Data Basin maps, the proposed Project is not within any Mineral Resource Zones.¹⁴ Therefore, implementation of the Project would not result in the loss of availability of a known mineral resource since no known mineral resources occur in this area. Furthermore, the Project area has not been designated as a locally important mineral resource recovery site by a general plan, specific plan, or land use plan. There would be no impact.

¹⁴ Data Basin Maps. [Mineral Resource Zones for Kern County | Data Basin](#) Accessed January, 2021

3.13 Noise

Table 3-22. Noise Impacts

Noise				
Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 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?	☐	☐	☐	☒

3.13.1 Environmental Setting

The Project area is located in an unincorporated area of Kern County, dominated by agricultural production. Residential development is sparse and spread out located on neighboring parcels. The Bakersfield Municipal Airport is located approximately five miles west, and the Creekside Water Ski Community Airport is located approximately 1.2 miles west of the Project area.

3.13.2 Impact Assessment

a) Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less than Significant Impact. Construction of the Project will involve temporary noise sources, originating predominately from off-road construction equipment, such as excavators, backhoes, graders, skid steers, loaders, and hauling trucks. The Project is located on and adjacent to agricultural lands, accustomed to similar noises associated with farm equipment. The Project will comply with the Kern County Municipal Code¹⁵ limiting construction activities to the hours of 6 am to 9 pm, Monday through Friday, and 8 am to 9 pm on weekends, when construction activities are located within 1,000 feet of an occupied residential dwelling. Similarly, portions of the Project that are within the City of Arvin will comply with City of Arvin Municipal Code¹⁶ which states workovers and other maintenance, including replacement in kind, shall not be permitted after 9:00 p.m. and before 6:00 a.m. or during Saturdays, Sundays or legal holidays, except in the event of an emergency as approved by the city manager. Operational maintenance activities would be on an as-needed basis with routine monitoring performed by existing staff and would not generate significant new noise. Operational maintenance activities would be consistent with baseline noise conditions routinely experienced

¹⁵ Kern County Noise Control Ordinance. [Chapter 8.36 - NOISE CONTROL | Code of Ordinances | Kern County, CA | Municode Library](#) Section 8.36.020 (H). Accessed January 2021.

¹⁶ City of Arvin

on site due to agricultural production. Any impacts would be mild and temporary and therefore, less than significant.

b) Would the project result in generation of excessive groundborne vibration or groundborne noise levels?

Less than Significant Impact. The Project is located in an area dominated by agricultural production, which includes the use of off-road equipment and ground-disturbing activities on a regular basis. The majority of construction will involve grading and trenching work and would be completed intermittently over five years. Conditions created by Project-related construction activities would not vary substantially from the baseline conditions routinely experienced onsite and would be temporary. As stated in a) above, the Project will comply with County and City of Arvin requirements regarding construction noise. Any impacts would be less than significant.

c) For a project located within the vicinity of a private air strip 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? and,

No Impact. The nearest airport, the Creekside Airport, is over approximately 1.2 miles away from the Project. The Project does not involve the development of habitable structures or require the presence of permanent staff onsite. Therefore, the Project would not expose people residing or working in the project area to excessive noise levels. There would be no impact.

3.14 Population and Housing

Table 3-23. Population and Housing Impacts

Population and Housing				
Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

3.14.1 Environmental Setting

Most of the the Project is located within an unincorporated area in Kern County. The Project area is surrounded by agricultural lands, rural residential uses, one City of Arvin neighborhood and water infrastructure. The Project will be predominately constructed on private agricultural property parallel to existing public county road right of way or along existing private drift farm roads between fields and orchards, short segments will cross public county road right of way.

3.14.2 Impact Assessment

a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? **No Impact.** The Project does not involve new housing or businesses, nor does it involve new infrastructure that could induce population growth. Therefore, the Project would not induce population growth. There would be no impact.

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

No Impact. The Project would not induce population growth. No housing or people would be displaced by the Project. There would be no impact.

3.15 Public Services

Table 3-24. Public Services Impacts

Public Services				
Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
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?	☐	☐	☐	☒

3.15.1 Environmental Setting

Fire Protection: The nearest fire stations to the Project area are Kern County Fire Department, Station 54 Arvin, and Station 51 Lamont, they are approximately one mile west, and one mile southwest of the Project area, respectively.

Police Protection: The nearest public safety services are provided by Kern County Sheriff's Office and the City of Arvin Police Department. The Sheriff's nearest substation is located approximately one mile from the Project Area. The Arvin Police Department is also located approximately one mile from the Project Area.

Schools: There are seven schools within one mile of the Project area: Mountain View Middle, Myrtle Avenue Elementary, Nueva Continuation High, Arvin High, Haven Drive Middle, Sierra Vista Elementary, and El Camino Elementary.

Parks: There are five parks within one mile of the Project area: Bear Mountain Park, Lamont Park, Kovacevich Park, DiGiorgio County Park, and Smothermon Park.

Landfills: The nearest landfill to the Project area is the Bena Landfill, which is approximately seven miles northeast of the Project area.

3.15.2 Impact Assessment

- 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:**

No Impact. The Project would not rely on the addition or alteration of any public services. The Project parcels are mainly within rural unincorporated land in Kern County, with a small portion of the Project pipeline running through City of Arvin in a mostly agricultural area, with a residential neighborhood to the north. The Project would have minimal needs for public services and would receive any needed services from existing agencies and departments. There would be no impact.

3.16 Recreation

Table 3-25. Recreation Impacts

Recreation				
Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

3.16.1 Environmental Setting

Kern County has several regional parks, as well as State and national parks, national forest, wilderness areas, and other resources. Regional recreational facilities within the County include ten developed and three undeveloped park sites, five fishing access areas, and boating facility. Additionally, the City of Arvin has six parks. There are no parks adjacent to the Project.

3.16.2 Impact Assessment

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? And;**

b) **Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?**

No Impact. No recreational facilities are adjacent to the Project pipelines. The Project would not increase population in the area and would therefore would not increase the demand for recreational facilities nor put a strain on the existing recreational facilities. This Project would not include or require recreational facilities. There would be no impact.

3.17 Transportation

Table 3-26. Transportation/Traffic Impacts

Transportation/Traffic				
Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☒	☐
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	☒	☐
c) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
d) Result in inadequate emergency access?	☐	☐	☒	☐

3.17.1 Environmental Setting

The Project area is within an unincorporated area in Kern County and a small portion of the City of Arvin. The vast majority of proposed pipeline alignments will be installed on private agricultural property parallel to existing public county road right of way or along existing private dirt farm roads between fields/orchards using the traditional cut-and-cover construction method. Short segments of the proposed pipelines will cross public road right of way and may require an encroachment permit from Kern County or the City of Arvin. Traffic generation after Project implementation would be minimal and dedicated to maintenance on an as-needed basis.

3.17.2 Impact Assessment

a) Would the project conflict with a plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities? And;

b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3. Subdivision (b)?

Less than Significant Impact. The Project does not require construction of any new roadways. The Project operations and maintenance would normally be completed by personnel already traveling by the site conducting other District duties and would therefore not materially exceed baseline conditions. Construction traffic would be temporary in nature over several years. There are no transit, pedestrian, or bicycle facilities in the vicinity of the Project and the need for any would not be necessitated by the Project. The Project would not conflict with any plan, ordinance, or policy regarding circulation. These impacts would be less than significant.

Construction associated with the Project would be restricted to the Project area, should the pipeline need to cross a County or City road, the Project would get an encroachment permit, and would utilize jack and bore to go under the existing roadway. Any construction-related impacts would be temporary and there would be no impacts to the surrounding transportation network.

There is no population growth associated with the Project, nor would implementation of the Project result in an increase of staff or drivers utilizing roadways in the area. Therefore, implementation of the Project would not increase the demand for any changes to congestion management programs or interfere with existing level

of service standards during the operational phase. Construction-related roadway interferences would be less than significant in nature.

c) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

No Impact. No new roadway design features are associated with the Project. As mentioned in Impact Assessments a and b above, all potential disturbances to roadways would be temporary. Therefore, there would be no impact.

d) Result in inadequate emergency access?

Less than Significant Impact. As mentioned above in Impact Assessments a, b, and c, the Project does not propose new roadway design features or permanent alterations to roadways. All potential disturbances to roadways during construction would be temporary. Road closures and detours are not anticipated as part of the construction phase of the Project. The operational phase of the Project would have no effect on roadways or emergency access. Therefore, overall potential Project-related impacts to emergency access on local roadways would be considered less than significant.

3.18 Tribal Cultural Resources

Table 3-27. Tribal Cultural Resources Impacts

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

3.18.1 Environmental Setting

The Project area is in the Southern Valley Yokuts ethnographic territory. Kroeber (1925: Plate 47) indicates that the study area most likely lies in Hometwoli Yokuts territory with the principal historic village for this group being Pohalin Tinliu, located on the south shore of Kern Lake. Similarly, Latta (1977) shows Pohalin Tinleu (Kroeber's Pohalin Tinliu) as the nearest village to the study area; however, he indicates that village was in Halaumne (i.e., Yaulumne) Yokuts territory. Although population estimates vary and population size was greatly affected by the introduction of Euro-American diseases and social disruption, the Yokuts were one of the largest, most successful groups in Native California. Cook (1978) estimates that the Yokuts region contained 27 percent of the aboriginal population in the state at the time of contact; other estimates are even higher. Many Yokuts people continue to reside in the southern San Joaquin Valley today ([Appendix C](#)).

3.18.2 Impact Assessment

- a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:**

a-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) and,

a-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, the lead agency shall consider the significance of the resource to a California Native American tribe.

Less than Significant Impact with Mitigation Incorporated. The District, as a public lead agency has not received any formal requests for notification from any State tribes, pursuant to AB52. ASM consulted the NAHC Sacred Lands files and no tribal cultural resources are known within the study area. Outreach to tribes and tribal organizations also failed to identify tribal cultural resources in or adjacent to the study area.

The NAHC responded to ASM's request on July 28, 2020, with negative findings for the Sacred Lands File search of the APE; however, they caution that the absence of information in the Sacred Lands File does not indicate the absence of Native American cultural resources within the APE. The NAHC provided a list of tribal representatives for outreach to local tribal groups regarding any sites of cultural or spiritual significance in the APE. Contacts recommended by the NAHC included:

- *Chairperson Elizabeth D. Kipp, Big Sandy Rancheria of Western Mono Indians;*
- *Chairperson Carol Bill, Cold Springs Rancheria;*
- *Chairperson Robert Ledger Sr., Dumna Wo-Wah Tribal Government;*
- *Tribal Chair Benjamin Charley Jr., Dunlap Band of Mono Indians,*
- *Tribal Secretary Dirk Charley, Dunlap Band of Mono Indians,*
- *Stan Alec, Kings River Choinumni Farm Tribe,*
- *Chairperson Ron Goode, North Fork Mono Tribe,*
- *Chairwoman Claudia Gonzales, Picayune Rancheria of Chukchansi Indians,*
- *Chairperson Leo Sisco, Santa Rosa Rancheria Tachi Yokut Tribe,*
- *Chairperson Leanne Walker-Grant, Table Mountain Rancheria,*
- *Cultural Resources Director, Bob Pennell, Table Mountain Rancheria,*
- *Chairperson David Alvarez, Traditional Choinumni Tribe,*
- *Cultural Resources Rick Osborne, Traditional Choinumni Tribe, and*
- *Chairperson Kenneth Woodrow, Wuksache Indian Tribe/Eshom Valley Band*

On August 18, 2020, ASM prepared and mailed an outreach letter to each of the contacts identified by the NAHC and kept a log of all responses. The outreach letter is standard best practices within cultural resource management and is not part of AB 52 or NHPA Section 106 government-to-government consultation. ASM's record of correspondence is included in **Appendix C**.

Although the site did not have findings during the Sacred Lands File search, it is still possible that tribal cultural resources could be found during construction. Therefore, in order to reduce any impacts to less than significant, CUL-1 and CUL-2 will be implemented.

3.19 Utilities and Service Systems

Table 3-28. Utilities and Service Systems Impacts

Utilities and Service Systems				
Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☐	☒
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☐	☒
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reductions goals?	☐	☐	☒	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

3.19.1 Environmental Setting

3.19.1.1 Water Supply

The Project lies entirely within the Kern County and White Wolf Groundwater Subbasin of the San Joaquin Valley Groundwater Basin.¹⁷ Declines in groundwater basin storage and groundwater overdraft are recurring problems in the Central Valley. Measures for ensuring the continued availability of groundwater to meet demands have been identified and planned in several areas of the county. The measures include groundwater conservation and recharge, and supplementing or replacing groundwater sources for irrigation with surface water.

3.19.2 Impact Assessment

a) 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?

No Impact. Project operation would not generate any wastewater, nor would it require any water treatment. No new water or wastewater facilities would be needed. There would be no impact.

¹⁷ DWR Bulletin 118 Groundwater Basin Boundary Assessment Tool. <https://gis.water.ca.gov/app/bbat/>. Accessed March 22, 2019.

b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

No Impact. No new or expanded water entitlements would be required for the Project. All waters transported by the Project would be done within the Districts' existing water contracts and/or rights. There would be no impact.

c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

No Impact. As discussed in Impact a) above, the Project would not generate wastewater. There would be no impact.

d) Would the project generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

Less than Significant Impact. Construction of the Project would generate minimal solid waste (trash) from temporary construction activities. However, this trash is expected to be collected regularly by contractors and legally disposed of in landfills with sufficient permitted capacity. Any impacts would be less than significant.

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

No Impact. The proposed Project would comply with any federal, state, and local regulations for any solid waste during construction. The Project would not generate any solid waste during operation. There is no impact.

3.20 Wildfire

Table 3-29. Wildfire Impacts

Wildfire				
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
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 uncontrollable spread of wildfire?	☐	☐	☐	☒
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

3.20.1 Environmental Setting

The Project is located on unincorporated land in Kern County. The Project area is in a flat rural area of the Central San Joaquin Valley. The construction would involve up to 44 miles of pipeline, totaling approximately 267-acres in size with most construction taking place within road right of ways. No structures are being constructed as part of the Project, and the Project is not considered to be population growth inducing.

3.20.2 Impact Assessment

- a) Would the project substantially impair an adopted emergency response plan or emergency evacuation plan?
And;
- b) Would the project, due to slope, prevailing winds, or other factors exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from wildfire or the uncontrolled spread of wildfire?
And;
- c) Would the project Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment? And;
- 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?

No Impact. Portions of the Project area are less than one mile from the moderate state responsibility zone. The Project involves the installation of up to 44 miles of pipeline and associated water infrastructure. There will be no habitable structures built, the Project area is relatively level and most of the Project will be underground. Therefore, the Project would not impact any emergency response plan or evacuation plan. It would not have any occupants and would therefore not expose people to pollutant concentrations from wildfire or uncontrolled spread of wildfire. No new infrastructure would need to be constructed to reduce fire risks as a result of the Project, and no people or structures would be exposed to flooding or landslides as a result of the Project. There would be no impacts.

3.21 CEQA Mandatory Findings of Significance

Table 3-30. Mandatory Findings of Significance Impacts

Mandatory Findings of Significance				
Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☒	☐	☐
c) Does the project have environmental effects which would cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

3.21.1 Impact Assessment

- 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 Impact with Mitigation Incorporated. The analysis conducted in this Initial Study/Mitigated Negative Declaration results in a determination that the Project, with incorporation of mitigation measures, would have a less than significant effect on the environment. The potential for impacts to biological resources and cultural resources from the implementation of the proposed Project would be less than significant with the incorporation of the mitigation measures discussed in **Chapter 4 Mitigation Monitoring and Reporting Program**. Accordingly, the Project would involve no potential for significant impacts through the degradation of the quality of the environment, the reduction in the habitat or population of fish or wildlife, including endangered plants or animals, the elimination of a plant or animal community or example of a major period 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)?

Less than Significant Impact with Mitigation Incorporated. CEQA Guidelines Section 15064(i) States that a Lead Agency shall consider whether the cumulative impact of a project is significant and whether the effects of the project are cumulatively considerable. The assessment of the significance of the cumulative effects of a project must, therefore, be conducted in connection with the effects of past projects, other current projects, and probable future projects. As discussed above, the Project would not result in any impacts individually limited. Any cumulatively considerable impacts given the compliance with applicable codes, ordinances, laws, mitigation measures and other required regulations would reduce the magnitude of any Project impacts to a less than significant level.

c) Does the project have environmental effects which would cause substantial adverse effects on human beings, either directly or indirectly?

No Impact. The Project would include the construction of approximately up to 44 miles of pipeline, manholes and turnouts. The Project in and of itself would not create a significant hazard to the public or the environment. On the contrary, implementation of the Project would provide better access to surface water to landowners within AEWSA. Construction-related air quality/dust exposure impacts could occur temporarily as a result of project construction. However, implementation of basic regulatory requirements identified in this IS/MND would ensure that impacts are less than significant. The Project would not result in substantial adverse effects on human beings, either directly or indirectly from implementation of the Project. There is no impact.

Chapter 4 Mitigation Monitoring and Reporting Program

This Mitigation Monitoring and Reporting Program (MMRP) has been formulated based upon the findings of the Initial Study/Mitigated Negative Declaration (IS/MND) for the Expansion of District Distribution System Pipelines into Groundwater Service Area Lands Project (Project) in Kern County. The MMRP lists mitigation measures recommended in the IS/MND for the Project and identifies monitoring and reporting requirements.

Table 4-1 presents the mitigation measures identified for the proposed Project. Each mitigation measure is numbered with a symbol indicating the topical section to which it pertains, a hyphen, and the impact number. For example, AIR-2 would be the second mitigation measure identified in the Air Quality analysis of the IS/MND.

The first column of **Table 4-1** identifies the mitigation measure. The second column, entitled “When Monitoring is to Occur,” identifies the time the mitigation measure should be initiated. The third column, “Frequency of Monitoring,” identifies the frequency of the monitoring of the mitigation measure. The fourth column, “Agency Responsible for Monitoring,” names the party ultimately responsible for ensuring that the mitigation measure is implemented. The last columns would be used by AEWS to ensure that individual mitigation measures have been complied with and monitored.

Chapter 4: Mitigation Monitoring and Reporting Program

Expansion of District Distribution System Pipelines into Groundwater Service Area Lands Project

Table 4-1. Mitigation Monitoring and Reporting Program

Mitigation Monitoring and Reporting Program					
Mitigation Measure/Condition of Approval	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
Biological Resources					
BIO-1(a) Worker Environmental Awareness Program (WEAP):					
Prior to initiation of construction activities (including staging and mobilization), all personnel associated with project construction shall attend WEAP training, conducted by a qualified biologist, to aid workers in recognizing special-status resources that may occur in the construction area. The specifics of this program shall include identification of the sensitive species, a description of the regulatory status and general ecological characteristics of sensitive resources, and review of the limits of construction and mitigation measures required to reduce impacts to biological resources within the work area. A fact sheet conveying this information shall also be prepared for distribution to all contractors, their employers, and other personnel involved with construction. All employees shall sign a form provided by the trainer indicating they have attended the WEAP and understand the information presented to them.	Prior to construction	During nesting season	AEWSD with assistance of a qualified biological subconsultant	By subconsultant report to AEWSD	
BIO-1(b) General Wildlife Pre-construction Surveys:					
Pre-construction clearance surveys for all special-status wildlife species shall be conducted within 30 days prior to the start of construction (including staging and mobilization) in areas of suitable habitat. The surveys shall cover the entire disturbance footprint plus a minimum 100-foot buffer within suitable habitat, where permissible, and should identify all special-status animal species that may occur on-site. Any non-listed special-status animals observed within the project area during the survey should be relocated by a qualified biologist to a safe location within suitable habitat as near to the project area as possible. If listed species that utilize burrows, such as blunt-nosed leopard lizard, Tipton kangaroo rat, and Nelson's antelope squirrel are detected during the preconstruction survey, all suitable burrows will be flagged for avoidance by a minimum distance of 50 feet, as described in BIO-1(c) below. If listed avian species, such as Swainson's hawk are detected during the preconstruction survey, active nests shall be protected with a disturbance-free buffer as described in BIO-1(f) below. If San Joaquin kit fox individuals or known or potential dens are detected during the preconstruction survey, dens will be monitored and protected with a disturbance-free buffer, as described in BIO-1(e) below. If complete avoidance of listed species and their nests, dens, or burrows is infeasible, the project proponent shall immediately contact CDFW and USFWS regarding incidental take permits.	Within 30 days prior to the start of construction (including staging and mobilization) in areas of suitable habitat	During ground disturbing activities	AEWSD with assistance of a qualified biological subconsultant	By subconsultant report to AEWSD	

Chapter 4: Mitigation Monitoring and Reporting Program

Expansion of District Distribution System Pipelines into Groundwater Service Area Lands Project

Mitigation Monitoring and Reporting Program					
Mitigation Measure/Condition of Approval	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
BIO-1(c) Focused Burrow Survey:					
Concurrent with the general wildlife pre-construction survey described above, a qualified biologist shall conduct a focused burrow survey within 30 days prior to the initiation of ground disturbance. All burrows within the proposed project pipeline alignments will be inspected for the potential presence of special-status animal species that utilize burrows, including American badger, Nelson's antelope squirrel, Tipton kangaroo rat, blunt-nosed leopard lizard, San Joaquin coachwhip, and coast horned lizard. If no special-status species are suspected to occupy any burrows within the project alignment, no further actions are required. If any special-status species, or their sign, are detected within burrows during the pre-construction burrow survey, then those burrows should be mapped and flagged for avoidance by minimum distance of 50 feet. If complete avoidance of burrows potentially occupied by a listed species is infeasible, the project proponent shall immediately contact CDFW and USFWS regarding incidental take permits.	Within 30 days prior to the initiation of ground disturbance	During ground disturbing activities	AEWSD with assistance of a qualified biological subconsultant	By subconsultant report to AEWSD	
BIO-1(d) Mitigation Measures for Burrowing Owl:					
A qualified biologist shall conduct pre-construction surveys prior to ground disturbance activities to confirm the presence/absence of burrowing owls. Pre-construction surveys shall be conducted during the appropriate time of day to maximize detectability within 30 days prior to construction and ground disturbance activities. If no burrowing owls are observed, no further actions are required. If burrowing owls are detected during the pre-construction clearance surveys, the following measures shall apply: - Avoidance buffers during the breeding and non-breeding season should be implemented in accordance with the CDFW (2012) and Burrowing Owl Consortium (1993) minimization mitigation measures. - If avoidance of burrowing owls is not feasible, then additional measures such as passive relocation during the nonbreeding season should be implemented, in consultation with CDFW. In addition, a Burrowing Owl Exclusion Plan and Mitigation and Monitoring Plan will be developed by a qualified biologist in accordance with the CDFW (2012) and Burrowing Owl Consortium (1993).	Prior to ground disturbance activities	During ground disturbing activities	AEWSD with assistance of a qualified biological subconsultant	By subconsultant report to AEWSD	
BIO-1(e) Mitigation Measures for San Joaquin Kit Fox					
A pre-construction clearance survey for San Joaquin kit fox shall also be conducted not less than 14 days and not more than 30 days prior to the initiation of ground-disturbing activities. The survey areas shall include the entire study area and all accessible undeveloped habitat within 200 feet, in accordance with the USFWS 2011 Standardized	Not less than 14 days and not more than 30 days prior to the initiation of ground-disturbing activities	During ground disturbing activities	AEWSD with assistance of a qualified biological subconsultant	By subconsultant report to AEWSD	

Chapter 4: Mitigation Monitoring and Reporting Program

Expansion of District Distribution System Pipelines into Groundwater Service Area Lands Project

Mitigation Monitoring and Reporting Program					
Mitigation Measure/Condition of Approval	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
<i>Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance. If any known or potential dens are detected, the den(s) shall be monitored for a minimum of three consecutive nights with remote-sensing cameras or tracking medium to evaluate current use. If San Joaquin kit fox use is observed, the den should be avoided by the recommended buffers outlined in the USFWS 2011 Standardized Recommendations, and the project proponent shall immediately notify USFWS and CDFW regarding incidental take permits.</i> • Construction activities shall adhere to the avoidance and minimization measures outlined in the USFWS 2011 Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance, outlined below: ○ Project-related vehicles should observe a 20-mph speed limit in all study areas, except on county roads and State and Federal highways; this is particularly important at night when kit foxes are most active. To the extent possible, night-time construction should be minimized. Off-road traffic outside of designated study areas should be prohibited. ○ To prevent inadvertent entrapment of kit foxes or other animals during the construction phase of a project, all excavated, steep-walled holes or trenches more than 2 feet deep should be covered at the close of each working day by plywood or similar materials or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they should be thoroughly inspected for trapped animals. If at any time a trapped or injured kit fox is discovered, the USFWS should be notified within three days of the discovery. ○ All food-related trash items such as wrappers, cans, bottles, and food scraps should be disposed of in closed containers and removed at least once a week from a construction or project site. ○ No firearms or pets should be allowed on the project site. ○ Use of rodenticides and herbicides in study areas should be restricted. This is necessary to prevent primary or secondary poisoning of kit foxes and the depletion of prey populations on which they depend. All uses of such compounds should observe label and other restrictions mandated by the U.S.					

Chapter 4: Mitigation Monitoring and Reporting Program

Expansion of District Distribution System Pipelines into Groundwater Service Area Lands Project

Mitigation Monitoring and Reporting Program					
Mitigation Measure/Condition of Approval	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
<i>Environmental Protection Agency, California Department of Food and Agriculture, and other State and Federal legislation, as well as additional project-related restrictions deemed necessary by the Service. If rodent control must be conducted, zinc phosphide should be used because of proven lower risk to kit fox.</i>					
BIO-1(f) Mitigation Measures for Swainson's Hawk, Cooper's Hawk, and Nesting Birds:					
Ground disturbance and vegetation removal activities shall be restricted to the non-breeding season (September 16 to January 31) when feasible. For ground disturbance and vegetation removal activities occurring during the bird nesting season (February 1 to September 15), general pre-construction nesting bird surveys shall be conducted by a qualified biologist (including for, but not limited to, Cooper's hawk and Swainson's hawk), within 30 days prior to the initiation of construction activities. Surveys shall include the disturbance area plus a 200-foot buffer for passerine species, a 500-foot buffer for raptors, and a 0.5-mile buffer for Swainson's hawk. If active nests are located, an appropriate avoidance buffer shall be established within which no work activity will be allowed which would impact these nests. The avoidance buffer would be established by the qualified biologist on a case-by-case basis based on the species and site conditions. In no cases should the buffer be smaller than 50 feet for non-raptor bird species or 200 feet for raptor species. Larger buffers may be required depending upon the status of the nest and the construction activities occurring in the vicinity of the nest. If State-listed threatened Swainson's hawks are documented nesting within 500 feet of construction activities, CDFW should be consulted on appropriate avoidance and minimization methods. The buffer area(s) should be closed to all construction personnel and equipment until juveniles have fledged and/or the nest is inactive. A qualified biologist should confirm that breeding/nesting is complete, and the nest is no longer active prior to removal of the buffer. If work within a buffer area cannot be avoided, then a qualified biologist will be present to monitor all project activities that occur within the buffer. The biological monitor will evaluate the nesting avian species for signs of disturbance and will have the ability to stop work.	Ground disturbance and vegetation removal activities shall be restricted to the non-breeding season (September 16 to January 31) when feasible. For ground disturbance and vegetation removal activities occurring during the bird nesting season (February 1 to September 15), general pre-construction nesting bird surveys shall be conducted by a qualified biologist (including for, but not limited to, Cooper's hawk and Swainson's hawk), within 30 days prior to the initiation of construction activities	Prior to ground disturbing activities and the start of construction	AEWSD with assistance of a qualified biological subconsultant	By subconsultant report to AEWSD	
BIO-2 Jurisdictional Delineation:					
The project shall be designed to avoid potentially jurisdictional aquatic features where feasible. If impacts to potentially jurisdictional features are unavoidable, the project proponent shall retain a qualified biologist to conduct a jurisdictional delineation to determine the extent of CDFW, USACE, and/or RWQCB jurisdiction. The delineation will be conducted in accordance with the requirements set forth by each agency. If the delineation determines that the project will result in impacts to	If impacts to potentially jurisdictional features are unavoidable	Prior to ground disturbing activities and the start of construction	AEWSD with assistance of a qualified biological subconsultant	By subconsultant report to AEWSD	

Chapter 4: Mitigation Monitoring and Reporting Program

Expansion of District Distribution System Pipelines into Groundwater Service Area Lands Project

Mitigation Monitoring and Reporting Program					
Mitigation Measure/Condition of Approval	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
a water of the State, then the project proponent shall submit an application to RWQCB for a Waste Discharge Requirements (WDR) permit and/or Section 401 Water Quality Certification (depending upon whether or not the feature also falls under federal jurisdiction). If the delineation determines that the project will result in impacts to features considered within CDFW's jurisdiction, then the project proponent will submit a Notification of Lake or Streambed Alteration Agreement pursuant to Section 1600 et seq. of the CFGC. If the delineation determines that the project will result in impacts to a water of the U.S., the project proponent shall submit a permit application to USACE, pursuant to Section 404 of the CWA. The project proponent shall abide by all permit conditions, and compensatory mitigation for all impacts to waters of the U.S., waters of the State and features subject to CDFW jurisdiction shall be completed at the ratio required in the applicable permits.					
Cultural Resources					
CUL-1: Archaeological Resources					
In the event that archaeological resources are encountered at any time during development or ground-moving activities within the entire project area, all work in the vicinity of the find shall halt until a qualified archaeologist can assess the discovery. The District shall implement all recommendations of the archaeologist necessary to avoid or reduce to a less than significant level potential impacts to cultural resource. Appropriate actions could include a Data Recovery Plan or preservation in place.	During ground disturbing activities and in the event potential archaeological artifacts or resources are uncovered	Daily during ground disturbing activities	AEWSD with assistance of a qualified cultural subconsultant	By subconsultant /contractor reports to AEWSD	
CUL-2: Human Remains					
If human remains are uncovered, or in any other case when human remains are discovered during construction, the Kern County Coroner is to be notified to arrange proper treatment and disposition. If the remains are identified—on the basis of archaeological context, age, cultural associations, or biological traits—as those of a Native American, California Health and Safety Code 7050.5 and Public Resource Code 5097.98 require that the coroner notify the NAHC within 24 hours of discovery. The NAHC would then identify the Most Likely Descendent who would determine the manner in which the remains are treated.	During ground disturbing activities and in the event human remains are uncovered	Daily during ground disturbing activities	AEWSD with assistance of a qualified cultural subconsultant	By subconsultant /contractor reports to AEWSD, Kern County Coroner notification and report, and notification to NAHC, if applicable	

Chapter 5 References

List of Sources, Websites, Agencies and Persons Consulted:

- California Air Pollution Control District. (2020). *California Emissions Estimator Model (CalEEMod) Version 2016.3.1*. Fresno: California Air Pollution Control District.
- California Department of Conservation - California Geological Survey. (2020). Retrieved from <http://subduction.rocks/Storage%20for%20Handouts%20and%20Reference%20Materials/CGS%20Anniversary%20California%20Facts%20150yrs.pdf>
- California Department of Conservation. (1984, May 18). *Farmland Mapping and Monitoring Program*. Retrieved from Farmland Mapping and Monitoring Program: <https://www.conservation.ca.gov/dlrp/fmmp>
- California Department of Water Resources. (2018). *DWR Groundwater Basin Boundary Assessment Tool*. Retrieved from DWR Groundwater Basin Boundary Assessment Tool: <https://gis.water.ca.gov/app/bbat/>
- EKI Environment and Water Inc. (2019, December). *Management Plan Area Kern County Subbasin*. Retrieved from Management Plan Area Kern County Subbasin: <https://aewsd.org/wp-content/uploads/AEWS-D-GSP-FINAL-2019-01-21.pdf>
- Kern County Parks and Recreation Department Lake Isabella. (2020). *Kern County Parks and Recreation Department Lake Isabella*. Retrieved from Kern County Parks and Recreation Department Lake Isabella: <https://www.kerncounty.com/Home/Components/FacilityDirectory/FacilityDirectory/16/32619>
- Kern County Williamson Act Eligible Agricultural Preserve/Kern County Williamson Act Parcels. (n.d.). *Kern County Williamson Act Eligible Agricultural Preserve/Kern County Williamson Act Parcels*. Retrieved from Kern County Williamson Act Eligible Agricultural Preserve/Kern County Williamson Act Parcels: <https://www.arcgis.com/home/item.html?id=0b47026d71b44be2887a1b574b0624ff&sublayer=0>
- Kern County. Code of Ordinances, Title 8 Health and Safety, Chapter 8.36 – Noise Control. (2020). *Kern County. Code of Ordinances, Title 8 Health and Safety, Chapter 8.36 – Noise Control*. Retrieved from Kern County. Code of Ordinances, Title 8 Health and Safety, Chapter 8.36 – Noise Control: https://library.municode.com/ca/kern_county/codes/code_of_ordinances?nodeId=TTT8HESA_CH8.36NOCO
- National Aeronautics and Space Administration Warmest Year on Record. (2017, January 18). *NASA NOAA Data Show 2016 Warmest Year on Record Globally*. Retrieved from NASA NOAA Data Show 2016 Warmest Year on Record Globally: <https://www.nasa.gov/press-release/nasa-noaa-data-show-2016-warmest-year-on-record-globally>
- Native American Heritage Commission Sacred Lands Files. (2020). *Native American Heritage Commission Sacred Lands Files*. Retrieved from Native American Heritage Commission Sacred Lands Files: <http://nahc.ca.gov>
- San Joaquin Valley Air Pollution Control District. (2009, December 17). *Guidance for Valley Land-use Agencies*. Retrieved from <http://www.valleyair.org/Programs/CCAP/12-17-09/3%20CCAP%20-%20FINAL%20LU%20Guidance%20-%20Dec%2017%202009.pdf>
- San Joaquin Valley Air Pollution Control District. (2015, February 19). *Guidance for Assessing and Mitigating Air Quality Impacts*. Retrieved from Guidance for Assessing and Mitigating Air Quality Impacts: <https://www.valleyair.org/transportation/GAMAQI-2015/FINAL-DRAFT-GAMAQI.PDF>
- State of California Air Resources Board. (2020). *State of California Air Resources Board Inhalable Particulate Matter and Health*. Retrieved from State of California Air Resources Board Inhalable Particulate Matter and Health: <https://ww2.arb.ca.gov/resources/inhalable-particulate-matter-and-health>
- State of California Department of Water Resources. (n.d.). *DWR Bulletin 118 Groundwater Basin Boundary Assessment Tool*. Retrieved from State of California Department of Water Resources DWR Bulletin 118 Groundwater Basin Boundary Assessment Tool: <https://gis.water.ca.gov/app/bbat/>
- State of California Department of Water Resources SGMA Portal. (n.d.). *State of California Department of Water Resources SGMA Portal*. Retrieved from GSP Map Viewer:

- https://sgma.water.ca.gov/webgis/?jsonfile=https%3a%2f%2fsgma.water.ca.gov%2fportal%2fresources%2fjs%2fmapconfigs%2fGspSubmittalsConfig.js&_dc=0.7524020922020793
- State of California Legislative Information. (2014, September 25). *State of California Legislative Information*. Retrieved from State of California Legislative Information: http://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB52
- United States Census Bureau Kern County CA. (2020). *United States Census Bureau Kern County*. Retrieved from United States Census Bureau Kern County: <https://data.census.gov/cedsci/profile?q=Kern%20County,%20California&g=0500000US06029&tld=ACSDP1Y2018.DP05>
- United States Department of Energy. (n.d.). *United States Department of Energy*. Retrieved from United States Department of Energy: <https://www.energy.gov/energysaver/save-electricity-and-fuel/lighting-choices-save-you-money/how-energy-efficient-light>
- United States Department of Transportation. Federal Highway Administration. (2019). *United States Department of Transportation. Federal Highway Administration*. Retrieved from United States Department of Transportation. Federal Highway Administration: <https://www.fhwa.dot.gov/byways/states/CA/maps>
- United States Environmental Protection Agency. (n.d.). *United States Environmental Protection Agency WATERS GeoViewer*. Retrieved from United States Environmental Protection Agency WATERS GeoViewer: <https://www.epa.gov/waterdata/waters-geoviewer>
- United States Federal Emergency Management Agency (FEMA) . (2020). *FEMA Flood Map Service Center*. Retrieved from FEMA Flood Map Service Center: <https://msc.fema.gov/portal/home>
- United States Fish and Wildlife Service. (2020). *United States Fish and Wildlife Service*. Retrieved from United States Fish and Wildlife Service National Wetlands Inventory: <https://www.fws.gov/wetlands/>
- United States Geological Survey Areas of Land Subsidence in California. (2020). *USGS Areas of Land Subsidence in California*. Retrieved from USGS Areas of Land Subsidence in California: https://ca.water.usgs.gov/land_subsidence/california-subsidence-areas.html
- United States Geological Survey. (2020). *United States Geological Survey*. Retrieved from United States Geological Survey: <https://edits.nationalmap.gov/wbd-app/?loc=-119.5487,36.6160,13>
- United States Geological Survey Science Explorer. (2020). *United States Geological Survey Science Explorer*. Retrieved from United States Geological Survey Science Explorer: <https://www.usgs.gov/science-explorer-results?es=Liquefaction+Susceptibility>

Chapter 6 List of Preparers

The following firms, individuals, and agency staff contributed to the preparation of this document:

Provost & Pritchard Consulting Group:
Briza Sholars – Project Manager/Senior Planner/QAQC
Mark Thompson – GIS
Amy Wilson - Assistant Planner
Jackie Lancaster – Administrative Support

Appendix A

CalEEMod Output Files

AEWSD GWSA - Kern-San Joaquin County, Annual

AEWSD GWSA

Kern-San Joaquin County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	267.00	Acre	267.00	11,630,520.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.7	Precipitation Freq (Days)	32
Climate Zone	7			Operational Year	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Construction will take place over two years.

Trips and VMT - NO buildings constructed, it would be pipelines and water turnouts. 20 trips per day anticipated.

Energy Use - Maximum of 56 KWh/year anticipated.

AEWSD GWSA - Kern-San Joaquin County, Annual

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	4,650.00	130.00
tblConstructionPhase	NumDays	465.00	130.00
tblConstructionPhase	NumDays	330.00	123.00
tblConstructionPhase	NumDays	180.00	130.00
tblEnergyUse	T24E	0.00	2.4075e-006
tblGrading	AcresOfGrading	325.00	1,162.50
tblTripsAndVMT	VendorTripNumber	1,906.00	10.00
tblTripsAndVMT	WorkerTripNumber	18.00	20.00
tblTripsAndVMT	WorkerTripNumber	4,885.00	20.00
tblTripsAndVMT	WorkerTripNumber	15.00	20.00

2.0 Emissions Summary

AEWSD GWSA - Kern-San Joaquin County, Annual

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	0.3980	4.1680	2.4401	4.6700e-003	2.0053	0.1985	2.2038	0.8255	0.1826	1.0081	0.0000	411.1442	411.1442	0.1288	0.0000	414.3637
2022	0.2732	2.6927	2.5349	4.8600e-003	0.8343	0.1237	0.9580	0.1793	0.1149	0.2942	0.0000	425.5860	425.5860	0.1153	0.0000	428.4677
2023	0.0317	0.2966	0.4343	7.0000e-004	4.6700e-003	0.0148	0.0195	1.2400e-003	0.0136	0.0149	0.0000	61.9142	61.9142	0.0189	0.0000	62.3858
Maximum	0.3980	4.1680	2.5349	4.8600e-003	2.0053	0.1985	2.2038	0.8255	0.1826	1.0081	0.0000	425.5860	425.5860	0.1288	0.0000	428.4677

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	0.3980	4.1680	2.4401	4.6700e-003	2.0053	0.1985	2.2038	0.8255	0.1826	1.0081	0.0000	411.1437	411.1437	0.1288	0.0000	414.3633
2022	0.2732	2.6927	2.5349	4.8600e-003	0.8343	0.1237	0.9580	0.1793	0.1149	0.2942	0.0000	425.5855	425.5855	0.1153	0.0000	428.4672
2023	0.0317	0.2966	0.4343	7.0000e-004	4.6700e-003	0.0148	0.0195	1.2400e-003	0.0136	0.0149	0.0000	61.9141	61.9141	0.0189	0.0000	62.3857
Maximum	0.3980	4.1680	2.5349	4.8600e-003	2.0053	0.1985	2.2038	0.8255	0.1826	1.0081	0.0000	425.5855	425.5855	0.1288	0.0000	428.4672

AEWSD GWSA - Kern-San Joaquin County, Annual

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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)
2	1-11-2021	4-10-2021	0.1590	0.1590
3	4-11-2021	7-10-2021	1.4466	1.4466
4	7-11-2021	10-10-2021	1.4687	1.4687
5	10-11-2021	1-10-2022	1.6373	1.6373
6	1-11-2022	4-10-2022	1.2827	1.2827
7	4-11-2022	7-10-2022	0.6011	0.6011
8	7-11-2022	10-10-2022	0.5791	0.5791
9	10-11-2022	1-10-2023	0.4019	0.4019
10	1-11-2023	4-10-2023	0.2873	0.2873
		Highest	1.6373	1.6373

AEWSD GWSA - Kern-San Joaquin County, Annual

2.2 Overall Operational**Unmitigated Operational**

	ROG	NOx	CO	SO2	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					
Area	0.9946	2.0000e-005	2.4500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.7700e-003	4.7700e-003	1.0000e-005	0.0000	5.0800e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9200e-003	8.9200e-003	0.0000	0.0000	8.9500e-003
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.9946	2.0000e-005	2.4500e-003	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0137	0.0137	1.0000e-005	0.0000	0.0140

AEWSD GWSA - Kern-San Joaquin County, Annual

2.2 Overall Operational**Mitigated Operational**

	ROG	NOx	CO	SO2	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					
Area	0.9946	2.0000e-005	2.4500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.7700e-003	4.7700e-003	1.0000e-005	0.0000	5.0800e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.9200e-003	8.9200e-003	0.0000	0.0000	8.9500e-003
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.9946	2.0000e-005	2.4500e-003	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0137	0.0137	1.0000e-005	0.0000	0.0140

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail**Construction Phase**

AEWSD GWSA - Kern-San Joaquin County, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/1/2021	9/29/2021	5	130	
2	Grading	Grading	10/1/2021	3/31/2022	5	130	
3	Building Construction	Building Construction	4/1/2022	9/29/2022	5	130	
4	Paving	Paving	10/1/2022	3/22/2023	5	123	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 1162.5

Acres of Paving: 267

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

AEWSD GWSA - Kern-San Joaquin County, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38

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
Site Preparation	7	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	20.00	10.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

AEWSD GWSA - Kern-San Joaquin County, Annual

3.2 Site Preparation - 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					
Fugitive Dust					1.1743	0.0000	1.1743	0.6455	0.0000	0.6455	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2527	2.6323	1.3750	2.4700e-003		0.1329	0.1329		0.1223	0.1223	0.0000	217.3322	217.3322	0.0703	0.0000	219.0894
Total	0.2527	2.6323	1.3750	2.4700e-003	1.1743	0.1329	1.3072	0.6455	0.1223	0.7678	0.0000	217.3322	217.3322	0.0703	0.0000	219.0894

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	4.6100e-003	3.0000e-003	0.0306	1.0000e-004	0.0105	7.0000e-005	0.0106	2.7800e-003	7.0000e-005	2.8500e-003	0.0000	9.2715	9.2715	2.2000e-004	0.0000	9.2770
Total	4.6100e-003	3.0000e-003	0.0306	1.0000e-004	0.0105	7.0000e-005	0.0106	2.7800e-003	7.0000e-005	2.8500e-003	0.0000	9.2715	9.2715	2.2000e-004	0.0000	9.2770

AEWSD GWSA - Kern-San Joaquin County, Annual

3.2 Site Preparation - 2021**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					1.1743	0.0000	1.1743	0.6455	0.0000	0.6455	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2527	2.6323	1.3750	2.4700e-003		0.1329	0.1329		0.1223	0.1223	0.0000	217.3319	217.3319	0.0703	0.0000	219.0891
Total	0.2527	2.6323	1.3750	2.4700e-003	1.1743	0.1329	1.3072	0.6455	0.1223	0.7678	0.0000	217.3319	217.3319	0.0703	0.0000	219.0891

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	4.6100e-003	3.0000e-003	0.0306	1.0000e-004	0.0105	7.0000e-005	0.0106	2.7800e-003	7.0000e-005	2.8500e-003	0.0000	9.2715	9.2715	2.2000e-004	0.0000	9.2770
Total	4.6100e-003	3.0000e-003	0.0306	1.0000e-004	0.0105	7.0000e-005	0.0106	2.7800e-003	7.0000e-005	2.8500e-003	0.0000	9.2715	9.2715	2.2000e-004	0.0000	9.2770

AEWSD GWSA - Kern-San Joaquin County, Annual

3.3 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					
Fugitive Dust					0.8151	0.0000	0.8151	0.1758	0.0000	0.1758	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1383	1.5312	1.0190	2.0500e-003		0.0655	0.0655		0.0603	0.0603	0.0000	179.8334	179.8334	0.0582	0.0000	181.2875
Total	0.1383	1.5312	1.0190	2.0500e-003	0.8151	0.0655	0.8807	0.1758	0.0603	0.2361	0.0000	179.8334	179.8334	0.0582	0.0000	181.2875

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	2.3400e-003	1.5300e-003	0.0155	5.0000e-005	5.3200e-003	4.0000e-005	5.3500e-003	1.4100e-003	3.0000e-005	1.4500e-003	0.0000	4.7071	4.7071	1.1000e-004	0.0000	4.7099
Total	2.3400e-003	1.5300e-003	0.0155	5.0000e-005	5.3200e-003	4.0000e-005	5.3500e-003	1.4100e-003	3.0000e-005	1.4500e-003	0.0000	4.7071	4.7071	1.1000e-004	0.0000	4.7099

AEWSD GWSA - Kern-San Joaquin County, Annual

3.3 Grading - 2021**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					0.8151	0.0000	0.8151	0.1758	0.0000	0.1758	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1383	1.5312	1.0190	2.0500e-003		0.0655	0.0655		0.0603	0.0603	0.0000	179.8332	179.8332	0.0582	0.0000	181.2873
Total	0.1383	1.5312	1.0190	2.0500e-003	0.8151	0.0655	0.8807	0.1758	0.0603	0.2361	0.0000	179.8332	179.8332	0.0582	0.0000	181.2873

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	2.3400e-003	1.5300e-003	0.0155	5.0000e-005	5.3200e-003	4.0000e-005	5.3500e-003	1.4100e-003	3.0000e-005	1.4500e-003	0.0000	4.7071	4.7071	1.1000e-004	0.0000	4.7099
Total	2.3400e-003	1.5300e-003	0.0155	5.0000e-005	5.3200e-003	4.0000e-005	5.3500e-003	1.4100e-003	3.0000e-005	1.4500e-003	0.0000	4.7071	4.7071	1.1000e-004	0.0000	4.7099

AEWSD GWSA - Kern-San Joaquin County, Annual

3.3 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					0.8091	0.0000	0.8091	0.1725	0.0000	0.1725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1160	1.2430	0.9293	1.9900e-003		0.0523	0.0523		0.0481	0.0481	0.0000	174.5107	174.5107	0.0564	0.0000	175.9217
Total	0.1160	1.2430	0.9293	1.9900e-003	0.8091	0.0523	0.8614	0.1725	0.0481	0.2206	0.0000	174.5107	174.5107	0.0564	0.0000	175.9217

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	2.1000e-003	1.3200e-003	0.0137	5.0000e-005	5.1600e-003	3.0000e-005	5.1900e-003	1.3700e-003	3.0000e-005	1.4000e-003	0.0000	4.3986	4.3986	1.0000e-004	0.0000	4.4010
Total	2.1000e-003	1.3200e-003	0.0137	5.0000e-005	5.1600e-003	3.0000e-005	5.1900e-003	1.3700e-003	3.0000e-005	1.4000e-003	0.0000	4.3986	4.3986	1.0000e-004	0.0000	4.4010

AEWSD GWSA - Kern-San Joaquin County, Annual

3.3 Grading - 2022**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					0.8091	0.0000	0.8091	0.1725	0.0000	0.1725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1160	1.2430	0.9293	1.9900e-003		0.0523	0.0523		0.0481	0.0481	0.0000	174.5105	174.5105	0.0564	0.0000	175.9215
Total	0.1160	1.2430	0.9293	1.9900e-003	0.8091	0.0523	0.8614	0.1725	0.0481	0.2206	0.0000	174.5105	174.5105	0.0564	0.0000	175.9215

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	2.1000e-003	1.3200e-003	0.0137	5.0000e-005	5.1600e-003	3.0000e-005	5.1900e-003	1.3700e-003	3.0000e-005	1.4000e-003	0.0000	4.3986	4.3986	1.0000e-004	0.0000	4.4010
Total	2.1000e-003	1.3200e-003	0.0137	5.0000e-005	5.1600e-003	3.0000e-005	5.1900e-003	1.3700e-003	3.0000e-005	1.4000e-003	0.0000	4.3986	4.3986	1.0000e-004	0.0000	4.4010

AEWSD GWSA - Kern-San Joaquin County, Annual

3.4 Building 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	tons/yr										MT/yr					
Off-Road	0.1109	1.0150	1.0636	1.7500e-003		0.0526	0.0526		0.0495	0.0495	0.0000	150.6214	150.6214	0.0361	0.0000	151.5235
Total	0.1109	1.0150	1.0636	1.7500e-003		0.0526	0.0526		0.0495	0.0495	0.0000	150.6214	150.6214	0.0361	0.0000	151.5235

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	1.9900e-003	0.0678	0.0125	1.8000e-004	4.3400e-003	1.7000e-004	4.5000e-003	1.2500e-003	1.6000e-004	1.4100e-003	0.0000	17.5637	17.5637	1.3000e-003	0.0000	17.5962
Worker	4.2700e-003	2.6800e-003	0.0279	1.0000e-004	0.0105	7.0000e-005	0.0106	2.7800e-003	6.0000e-005	2.8500e-003	0.0000	8.9347	8.9347	2.0000e-004	0.0000	8.9396
Total	6.2600e-003	0.0704	0.0404	2.8000e-004	0.0148	2.4000e-004	0.0151	4.0300e-003	2.2000e-004	4.2600e-003	0.0000	26.4984	26.4984	1.5000e-003	0.0000	26.5358

AEWSD GWSA - Kern-San Joaquin County, Annual

3.4 Building Construction - 2022**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	0.1109	1.0150	1.0636	1.7500e-003		0.0526	0.0526		0.0495	0.0495	0.0000	150.6212	150.6212	0.0361	0.0000	151.5233
Total	0.1109	1.0150	1.0636	1.7500e-003		0.0526	0.0526		0.0495	0.0495	0.0000	150.6212	150.6212	0.0361	0.0000	151.5233

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	1.9900e-003	0.0678	0.0125	1.8000e-004	4.3400e-003	1.7000e-004	4.5000e-003	1.2500e-003	1.6000e-004	1.4100e-003	0.0000	17.5637	17.5637	1.3000e-003	0.0000	17.5962
Worker	4.2700e-003	2.6800e-003	0.0279	1.0000e-004	0.0105	7.0000e-005	0.0106	2.7800e-003	6.0000e-005	2.8500e-003	0.0000	8.9347	8.9347	2.0000e-004	0.0000	8.9396
Total	6.2600e-003	0.0704	0.0404	2.8000e-004	0.0148	2.4000e-004	0.0151	4.0300e-003	2.2000e-004	4.2600e-003	0.0000	26.4984	26.4984	1.5000e-003	0.0000	26.5358

AEWSD GWSA - Kern-San Joaquin County, Annual

3.5 Paving - 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	0.0358	0.3616	0.4739	7.4000e-004		0.0185	0.0185		0.0170	0.0170	0.0000	65.0896	65.0896	0.0211	0.0000	65.6158
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0358	0.3616	0.4739	7.4000e-004		0.0185	0.0185		0.0170	0.0170	0.0000	65.0896	65.0896	0.0211	0.0000	65.6158

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	2.1300e-003	1.3400e-003	0.0140	5.0000e-005	5.2400e-003	3.0000e-005	5.2700e-003	1.3900e-003	3.0000e-005	1.4200e-003	0.0000	4.4673	4.4673	1.0000e-004	0.0000	4.4698
Total	2.1300e-003	1.3400e-003	0.0140	5.0000e-005	5.2400e-003	3.0000e-005	5.2700e-003	1.3900e-003	3.0000e-005	1.4200e-003	0.0000	4.4673	4.4673	1.0000e-004	0.0000	4.4698

AEWSD GWSA - Kern-San Joaquin County, Annual

3.5 Paving - 2022**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	0.0358	0.3616	0.4739	7.4000e-004		0.0185	0.0185		0.0170	0.0170	0.0000	65.0895	65.0895	0.0211	0.0000	65.6158
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0358	0.3616	0.4739	7.4000e-004		0.0185	0.0185		0.0170	0.0170	0.0000	65.0895	65.0895	0.0211	0.0000	65.6158

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	2.1300e-003	1.3400e-003	0.0140	5.0000e-005	5.2400e-003	3.0000e-005	5.2700e-003	1.3900e-003	3.0000e-005	1.4200e-003	0.0000	4.4673	4.4673	1.0000e-004	0.0000	4.4698
Total	2.1300e-003	1.3400e-003	0.0140	5.0000e-005	5.2400e-003	3.0000e-005	5.2700e-003	1.3900e-003	3.0000e-005	1.4200e-003	0.0000	4.4673	4.4673	1.0000e-004	0.0000	4.4698

AEWSD GWSA - Kern-San Joaquin County, Annual

3.5 Paving - 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	0.0300	0.2956	0.4229	6.6000e-004		0.0148	0.0148		0.0136	0.0136	0.0000	58.0779	58.0779	0.0188	0.0000	58.5475
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0300	0.2956	0.4229	6.6000e-004		0.0148	0.0148		0.0136	0.0136	0.0000	58.0779	58.0779	0.0188	0.0000	58.5475

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	1.7700e-003	1.0700e-003	0.0114	4.0000e-005	4.6700e-003	3.0000e-005	4.7000e-003	1.2400e-003	3.0000e-005	1.2700e-003	0.0000	3.8363	3.8363	8.0000e-005	0.0000	3.8382
Total	1.7700e-003	1.0700e-003	0.0114	4.0000e-005	4.6700e-003	3.0000e-005	4.7000e-003	1.2400e-003	3.0000e-005	1.2700e-003	0.0000	3.8363	3.8363	8.0000e-005	0.0000	3.8382

AEWSD GWSA - Kern-San Joaquin County, Annual

3.5 Paving - 2023**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	0.0300	0.2956	0.4229	6.6000e-004		0.0148	0.0148		0.0136	0.0136	0.0000	58.0778	58.0778	0.0188	0.0000	58.5474
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0300	0.2956	0.4229	6.6000e-004		0.0148	0.0148		0.0136	0.0136	0.0000	58.0778	58.0778	0.0188	0.0000	58.5474

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	1.7700e-003	1.0700e-003	0.0114	4.0000e-005	4.6700e-003	3.0000e-005	4.7000e-003	1.2400e-003	3.0000e-005	1.2700e-003	0.0000	3.8363	3.8363	8.0000e-005	0.0000	3.8382
Total	1.7700e-003	1.0700e-003	0.0114	4.0000e-005	4.6700e-003	3.0000e-005	4.7000e-003	1.2400e-003	3.0000e-005	1.2700e-003	0.0000	3.8363	3.8363	8.0000e-005	0.0000	3.8382

4.0 Operational Detail - Mobile

AEWSD GWSA - Kern-San Joaquin County, Annual

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	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					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.492592	0.029877	0.172571	0.108744	0.015451	0.005259	0.018880	0.146151	0.001599	0.001570	0.005698	0.000896	0.000711

AEWSD GWSA - Kern-San Joaquin County, Annual

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

[illegible]

5.2 Energy by Land Use - NaturalGas

Unmitigated

[illegible]

Mitigated

[illegible]

AEWSD GWSA - Kern-San Joaquin County, Annual

5.3 Energy by Land Use - Electricity**Unmitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	28	8.9200e-003	0.0000	0.0000	8.9500e-003
Total		8.9200e-003	0.0000	0.0000	8.9500e-003

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	28	8.9200e-003	0.0000	0.0000	8.9500e-003
Total		8.9200e-003	0.0000	0.0000	8.9500e-003

6.0 Area Detail**6.1 Mitigation Measures Area**

AEWSD GWSA - Kern-San Joaquin County, Annual

	ROG	NOx	CO	SO2	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					
Mitigated	0.9946	2.0000e-005	2.4500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.7700e-003	4.7700e-003	1.0000e-005	0.0000	5.0800e-003
Unmitigated	0.9946	2.0000e-005	2.4500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.7700e-003	4.7700e-003	1.0000e-005	0.0000	5.0800e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.2426					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7518					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.3000e-004	2.0000e-005	2.4500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.7700e-003	4.7700e-003	1.0000e-005	0.0000	5.0800e-003
Total	0.9946	2.0000e-005	2.4500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.7700e-003	4.7700e-003	1.0000e-005	0.0000	5.0800e-003

AEWSD GWSA - Kern-San Joaquin County, Annual

6.2 Area by SubCategory**Mitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.2426					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7518					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.3000e-004	2.0000e-005	2.4500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.7700e-003	4.7700e-003	1.0000e-005	0.0000	5.0800e-003
Total	0.9946	2.0000e-005	2.4500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.7700e-003	4.7700e-003	1.0000e-005	0.0000	5.0800e-003

7.0 Water Detail**7.1 Mitigation Measures Water**

AEWSD GWSA - Kern-San Joaquin County, Annual

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

AEWSD GWSA - Kern-San Joaquin County, Annual

7.2 Water by Land Use**Mitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

8.0 Waste Detail

8.1 Mitigation Measures Waste**Category/Year**

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

AEWSD GWSA - Kern-San Joaquin County, Annual

8.2 Waste by Land Use**Unmitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
----------------	--------	-----------	-----------	-------------	-------------	-----------

AEWSD GWSA - Kern-San Joaquin County, Annual

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
----------------	--------	-----------	------------	-------------	-------------	-----------

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
----------------	--------	----------------	-----------------	---------------	-----------

User Defined Equipment

Equipment Type	Number
----------------	--------

11.0 Vegetation

Appendix B

Biological Resources Assessment



Arvin-Edison Water Storage District (AEWSD) Groundwater Service Area (GWSA) Project

Biological Resources Assessment

prepared by

Provost & Pritchard Consulting Group

Randy Hopkins

286 West Cromwell Avenue

Fresno, California 93711

Via email: rhopkins@ppeng.com

prepared with the assistance of

Rincon Consultants, Inc.

7080 North Whitney Avenue, Suite 101

Fresno, California 93720

December 2020



RINCON CONSULTANTS, INC.

Environmental Scientists | Planners | Engineers

rinconconsultants.com

Arvin-Edison Water Storage District (AEWSD) Groundwater Service Area (GWSA) Project

Biological Resources Assessment

prepared by

Provost & Pritchard Consulting Group

Randy Hopkins

286 West Cromwell Avenue

Fresno, California 93711

Via email: rhopkins@ppeng.com

prepared with the assistance of

Rincon Consultants, Inc.

7080 North Whitney Avenue, Suite 101

Fresno, California 93720

December 2020



RINCON CONSULTANTS, INC.

Environmental Scientists | Planners | Engineers

rinconconsultants.com

This report prepared on 50% recycled paper with 50% post-consumer content.

Table of Contents

Executive Summary	1
1 Introduction	3
1.1 Project Location	3
1.2 Project Description and Purpose	3
2 Methodology	9
2.1 Regulatory Overview	9
2.1.1 Definition of Special-status Species	9
2.1.2 Environmental Statutes	9
2.1.3 Guidelines for Determining CEQA Significance	10
2.2 Biological Study Area	10
2.3 Literature Review	10
2.4 Field Reconnaissance Survey	11
3 Existing Conditions	12
3.1 Physical Characteristics	12
3.1.1 Watershed and Drainages	12
3.1.2 Soils	13
3.2 Vegetation and Other Land Cover	18
3.3 General Wildlife	18
4 Sensitive Biological Resources	20
4.1 Special-status Species	20
4.1.1 Special-status Plant Species	20
4.1.2 Special-status Animal Species	20
4.1.3 Other Protected Species	25
4.2 Sensitive Plant Communities and Critical Habitats	25
4.3 Jurisdictional Waters and Wetlands	25
4.4 Wildlife Movement	26
4.5 Habitat Conservation Plans	27
5 Impact Analysis and Mitigation Measures	29
5.1 Special-status Species	29
5.2 Sensitive Plant Communities and Critical Habitat	32
5.3 Jurisdictional Waters and Wetlands	33
5.4 Wildlife Movement	33
5.5 Habitat Conservation Plans	34
6 Limitations, Assumptions, and Use Reliance	35
7 References	36
8 List of Preparers	39

Tables

Table 1 Existing Soils Within BSA.....13

Table 2 Special-status Animals with Potential to Occur within the BSA21

Figures

Figure 1 Regional Location.....4

Figure 2 Proposed Pipeline Alignment.....5

Figure 3a Biological Study Area6

Figure 3b Biological Study Area7

Figure 3c Biological Study Area8

Figure 4a Soils15

Figure 4b Soils16

Figure 4c Soils17

Appendices

Appendix A Regulatory Framework

Appendix B Site Photographs

Appendix C Floral and Faunal Compendium

Appendix D Special-status Species Evaluation Tables

Executive Summary

This document provides the findings of a Biological Resources Assessment prepared by Rincon Consultants, Inc. for the proposed Arvin-Edison Water Storage District Groundwater Service Area project. The proposed project includes the construction of approximately 44 miles of water pipelines in the Arvin-Edison Water Storage District. The goal of the project is to deliver wet-period surface water to landowners who would otherwise pump groundwater within the Groundwater Service Area.

The proposed pipeline alignment is located at the southern end of the San Joaquin Valley, in south central Kern County. The pipeline alignment lies primarily within unincorporated areas of Kern County, with some segments falling within the City of Arvin.

No sensitive natural communities are located within the project area and no regional wildlife linkages or corridors are mapped within the project area. Project implementation would not interfere with the provisions of any applicable adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan. Therefore, implementation of the project would not result in impacts to these sensitive resources.

Rincon Consultants, Inc. assessed the potential for 37 special-status plant species to occur within the project area and a 100-foot buffer. None of these species are expected to occur. Thirty-six special-status animal species were assessed for their potential to occur within the project area. Seven of these species have a low potential to occur: blunt-nosed leopard lizard (*Gambelia sila*, Federally- endangered, State endangered), California glossy snake (*Arizona elegans occidentalis*, California Fish and Wildlife Species of Special Concern), Coast horned lizard (*Phrynosoma blainvillii*, California Fish and Wildlife Species of Special Concern), Nelson's antelope squirrel (*Ammospermophilus nelsoni*, State threatened), San Joaquin coachwhip (*Masticophis flagellum ruddocki*, California Fish and Wildlife Species of Special Concern), Tehachapi pocket mouse (*Perognathus alticola inexpectatus*, California Fish and Wildlife Species of Special Concern), and Tipton kangaroo rat (*Dipodomys nitratoide nitratoide*, Federally endangered and State endangered). Two of these species have moderate potential to occur: American badger (*Taxidea taxus*, California Fish and Wildlife Species of Special Concern) and San Joaquin kit fox (*Vulpes macrotis mutica*, Federally endangered and State threatened). Two of these species have high potential to occur: burrowing owl (*Athene cunicularia*, California Fish and Wildlife Species of Special Concern) and Swainson's hawk (*Buteo swainsoni*, State threatened). One species was observed within the project area during the field reconnaissance surveys: Cooper's hawk (*Accipiter cooperii*, California Fish and Wildlife Watch List species).

The United States Fish and Wildlife Service National Wetlands Inventory identifies the following potentially jurisdictional waterways within the project area: Tejon Creek; Caliente Creek; East Side Canal; Arvin-Edison Canal; an unnamed agricultural drainage that runs parallel to Millux Road; an unnamed wetland area associated with the unnamed drainage; two unnamed lakes used for groundwater recharge by the AEWSD; and multiple freshwater emergent ponds and wetlands excavated for agricultural purposes. However, these water features within the project area are primarily excavated basins and canals used for agricultural purposes and the entire proposed pipeline installation alignment occurs along existing roads and previously disturbed areas. Therefore, project impacts to jurisdictional waterways would likely be minimal.

The proposed project could impact special-status species (including nesting birds) within the project area if these species are present during construction. Impacts to special-status species from project related activities may include mortality or injury to individuals, disturbance of breeding activities, disturbance to habitat, and/or construction noise and other human disturbances. Additionally, the project could impact potentially jurisdictional wetlands and other waters of the U.S. and State. These impacts would be potentially significant but can be reduced to less than significant through implementation of recommended mitigation measures.

1 Introduction

Rincon Consultants, Inc. (Rincon) has prepared this Biological Resources Assessment (BRA) to document existing conditions, summarize previous biological resource reports and studies, and provide a basis for evaluation of potential impacts to special-status and sensitive biological resources from the implementation of the proposed Arvin-Edison Water Storage District (AEWSD) Groundwater Service Area (GWSA) project (project) located in Kern County, California. This BRA has been prepared to support the California Environmental Quality Act (CEQA) and National Environmental Protection Act (NEPA) environmental review of the project.

1.1 Project Location

The proposed pipeline alignment is located at the southern end of the San Joaquin Valley, in south central Kern County (Figure 1, Figure 2, and Figure 3), within the Great Valley Ecoregion. The pipeline will be located primarily within unincorporated areas of Kern County, with some segments falling within the City of Arvin. The project lies within the *Arvin, Weed Patch, Lamont, and Edison* United States Geological Survey (USGS) 7.5-minute quadrangles (quads). The approximate center of the project area is located at GPS coordinates 35.209117, -118.851641 (WGS 84).

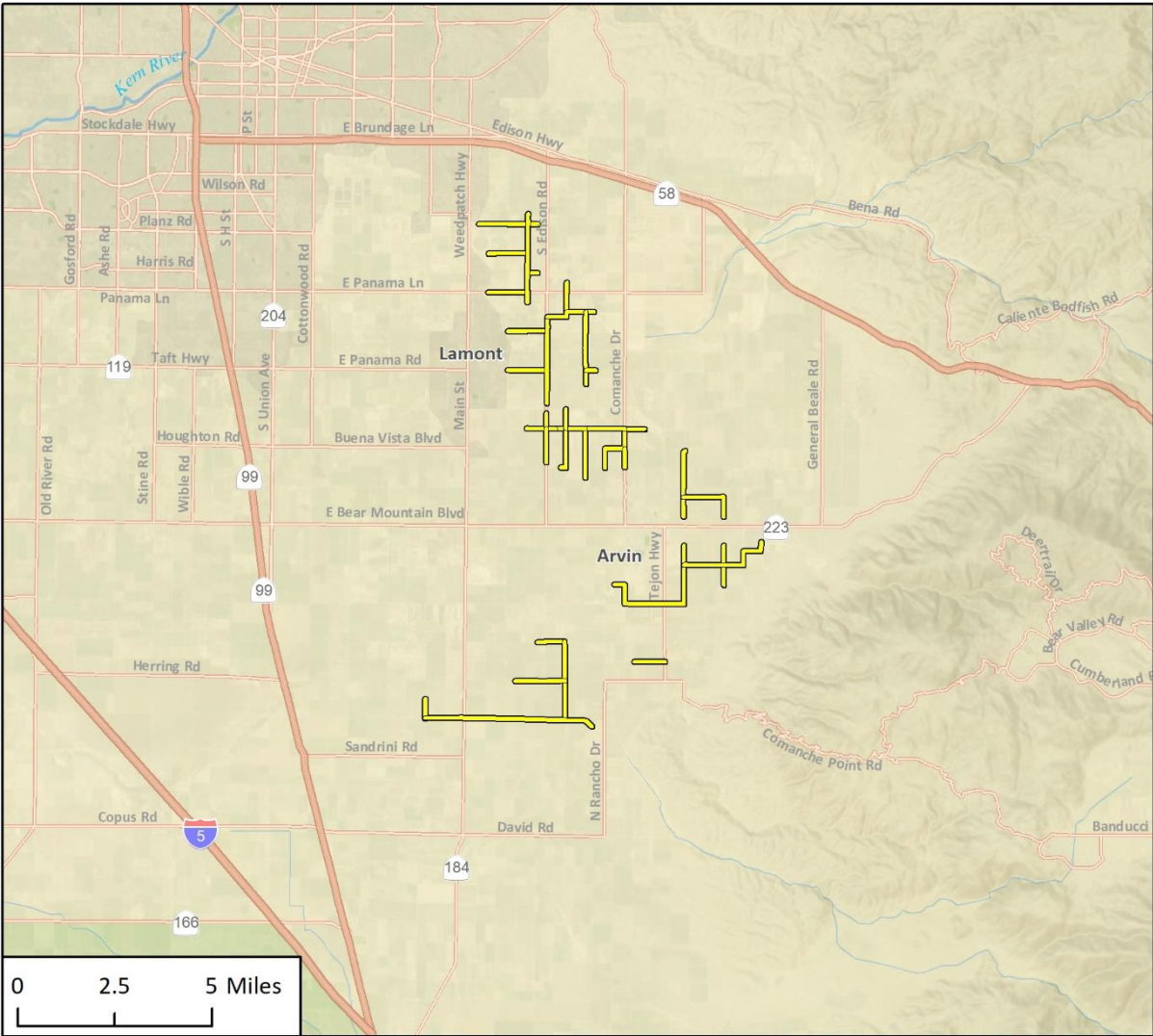
1.2 Project Description and Purpose

The proposed project includes the construction of approximately 44 miles of water pipelines in the AEWSD. The majority of the proposed pipeline alignment will be installed on private agricultural property parallel to existing public county road right-of-way, or along existing private dirt farm roads between fields or orchards using the traditional cut-and-cover construction method. The AEWSD currently provides irrigation surface water to irrigate agricultural lands in its Surface Water Service Area (SWSA). The GWSA historically relied on groundwater from private landowner wells for irrigation. In recent years, the AEWSD has delivered surface water under Temporary Water Service Contracts (Temporary Water) to certain GWSA lands when surface water supplies are available beyond the needs of the SWSA and as existing facilities allow for such Temporary Water delivery, in order to maximize use of the District's surface water supplies.

The goal of the project is to deliver wet-period surface water to landowners who would otherwise pump groundwater within the GWSA. The proposed pipelines will be low-head gravity distribution pipelines ranging from 12" to 72" in diameter, operated when excess surface water is available (approximately every three years) and/or when water transfers are scheduled. The largest pipe sizes will be proportionally short distances near the heads of the branching gravity pipeline networks serving various private agricultural fields and orchards.

Arvin-Edison Water Storage District
Arvin-Edison Water Storage District (AEWSD) Groundwater Service Area (GWSA) Project

Figure 1 Regional Location



— Proposed Pipeline

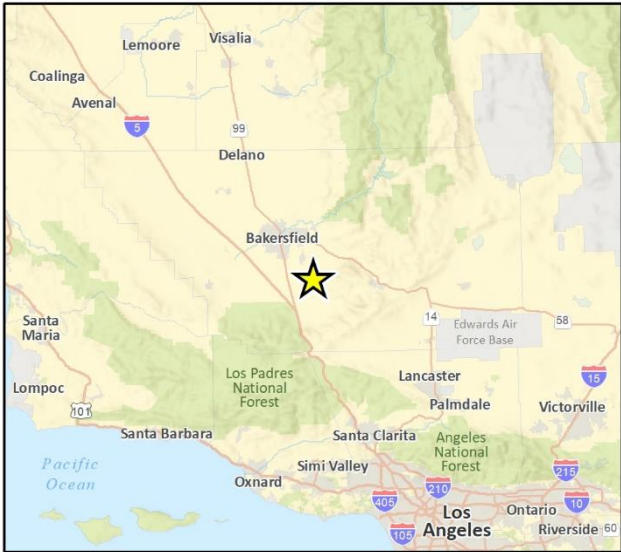


Fig 1 Regional Location

Figure 2 Proposed Pipeline Alignment

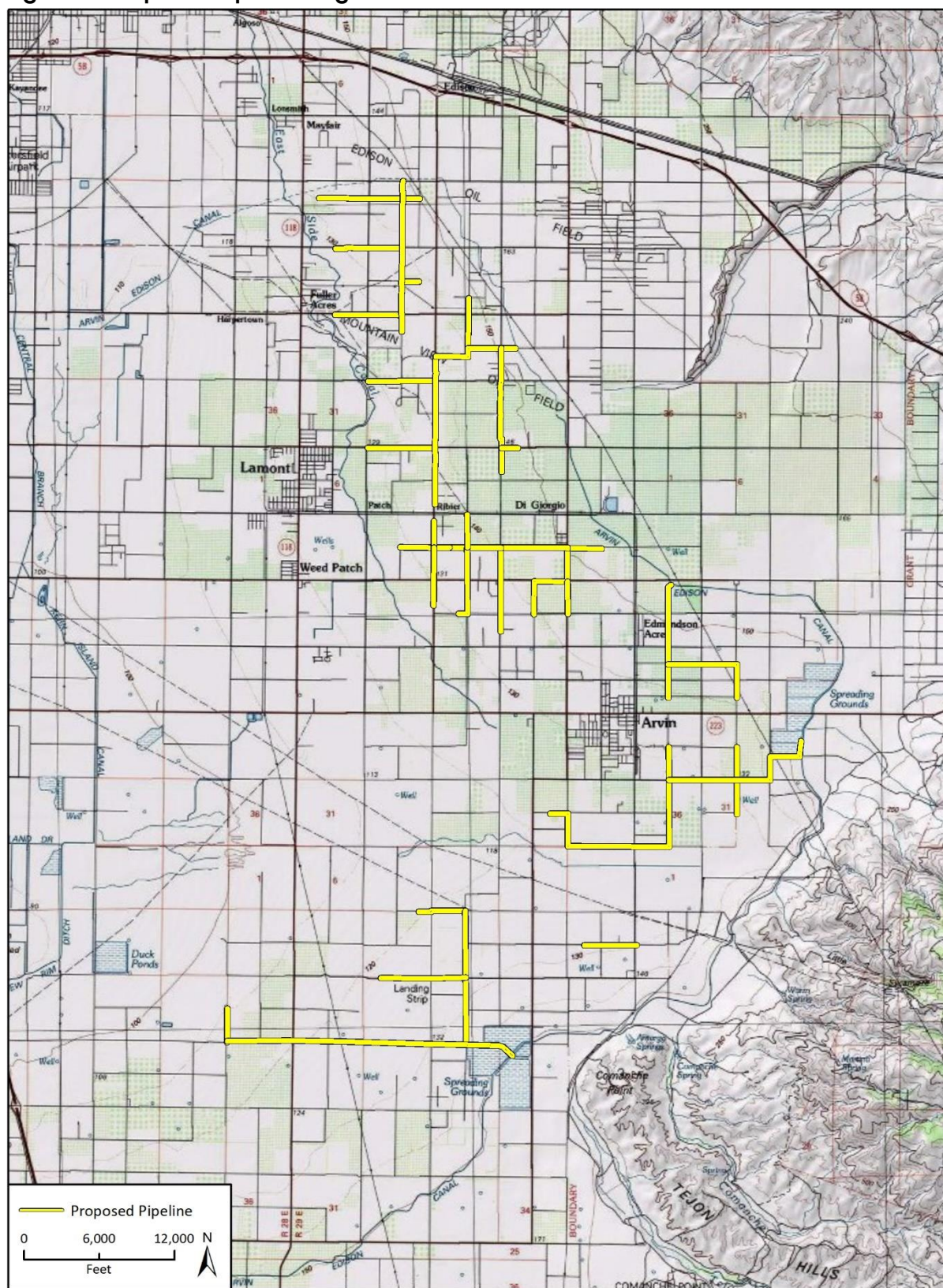


Fig 2 Topo

Figure 3a Biological Study Area

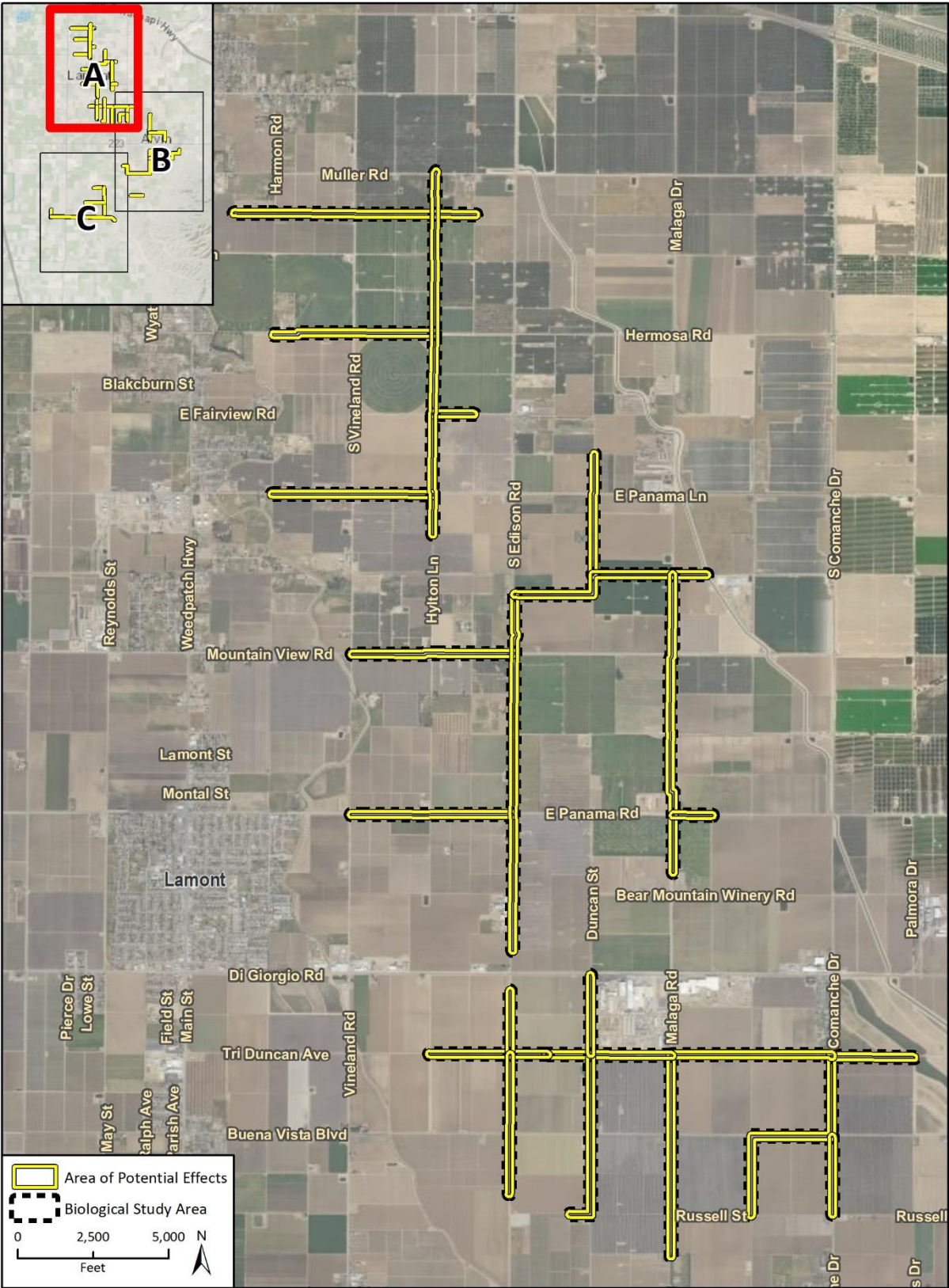
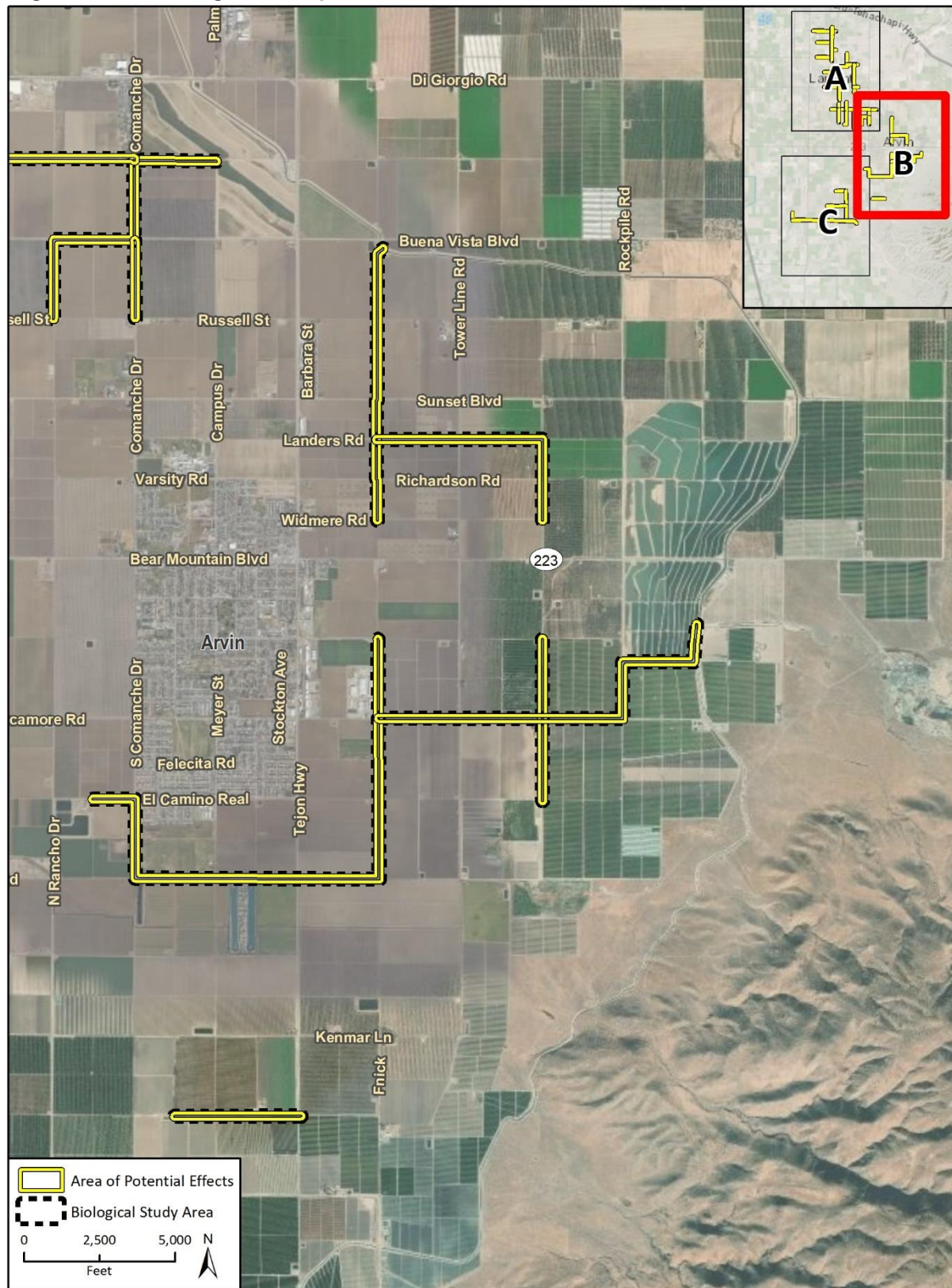
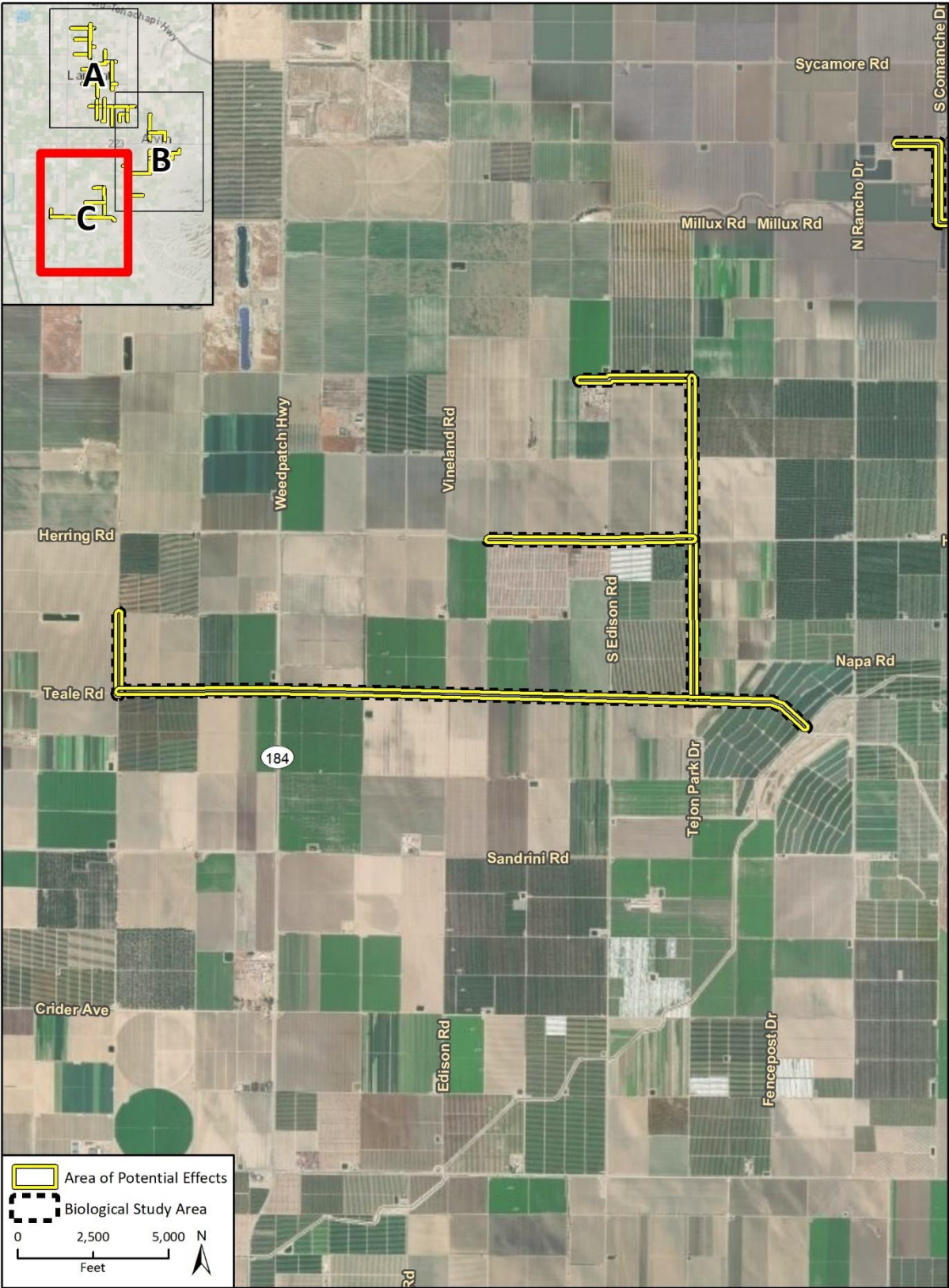


Figure 3b Biological Study Area

Imagery provided by Microsoft Bing and its licensors © 2020.

Fig 3 BSA

Figure 3c Biological Study Area



2 Methodology

2.1 Regulatory Overview

Regulated or sensitive resources studied and analyzed herein include special-status plant and animal species, nesting birds and raptors, sensitive plant communities, jurisdictional waters and wetlands, wildlife movement, and locally protected resources, such as protected trees. Regulatory authority over biological resources is shared by federal, State, and local authorities. Primary authority for regulation of general biological resources lies within the land use control and planning authority of local jurisdictions (in this instance, Kern County and the City of Arvin).

2.1.1 Definition of Special-status Species

For the purposes of this report, special-status species include:

- Species listed as threatened or endangered under the Federal Endangered Species Act (FESA); species that are under review may be included if there is a reasonable expectation of listing within the life of the project.
- Species listed as candidate, threatened, or endangered under the California Endangered Species Act (CESA).
- Species designated as Fully Protected, Species of Special Concern, or Watch List by the California Department of Fish and Wildlife (CDFW).
- Species designated as locally important by the Local Agency and/or otherwise protected through ordinance or local policy.

2.1.2 Environmental Statutes

For the purpose of this report, potential impacts to biological resources were analyzed based on the following statutes (Appendix A):

- National Environmental Policy Act (NEPA)
- California Environmental Quality Act (CEQA)
- Federal Endangered Species Act (FESA)
- California Endangered Species Act (CESA)
- Federal Clean Water Act (CWA)
- California Fish and Game Code (CFGF)
- Migratory Bird Treaty Act (MBTA)
- The Bald and Golden Eagle Protection Act
- Porter-Cologne Water Quality Control Act
- Metropolitan Bakersfield Habitat Conservation Plan (HCP)
- Kern County General Plan
- Kern County Municipal Code
- City of Arvin General Plan
- City of Arvin Municipal Code

2.1.3 Guidelines for Determining CEQA Significance

The following threshold criteria, as defined by the CEQA Guidelines Appendix G Initial Study Checklist, were used to evaluate potential environmental effects. Based on these criteria, the proposed project would have a significant effect on biological resources if it would:

- a) *Have 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 the California Department of Fish and Wildlife 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, and regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service.*
- c) *Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.*
- d) *Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.*
- e) *Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.*
- f) *Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan.*

2.2 Biological Study Area

The Biological Study Area (BSA) evaluated for this analysis includes the entire 44-mile length of the proposed construction area plus a 100-foot buffer (approximately 1,070 acres). Due to the non-linear nature of the project area, the BSA was divided into three equal rectangular sections labeled A, B, and C (Figure 3).

2.3 Literature Review

Rincon conducted a literature review to characterize the nature and extent of biological resources on and adjacent to the BSA. The literature review included an evaluation of current and historical aerial photographs of the site (Google Earth), regional and site-specific topographic maps, climatic data, and other available background information.

Queries of the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation system (IPaC; UFWS 2020a), CDFW California Natural Diversity Database (CNDDDB; 2020a), and California Native Plant Society (CNPS) online Inventory of Rare and Endangered Plants of California (2020) were conducted to obtain comprehensive information regarding State and federally-listed species, and other special-status species, considered to have potential to occur within the project area and surrounding 20 USGS quads (an area of approximately 144 by 172 miles). The results of database-queries and lists of special-status species were reviewed by Rincon's regional biological experts for accuracy and completeness. The final list of special-status biological resources to be evaluated is the result of documented occurrences in the 5-mile radius search area and species

known to occur in the region based on the expert opinions of local biologists. The results of the species potential-to-occur assessment were compiled into a table presented as Appendix D.

Additionally, the vegetation community characterizations for this analysis were based on the classification systems presented in the *United States National Vegetation Classification* (USNVC) and *A Manual of California Vegetation, Second Edition* (Sawyer et al. 2009). The potential for wildlife movement corridors was evaluated based on the California Essential Habitat Connectivity Project commissioned by the California Department of Transportation and CDFW (Spencer et al. 2010).

The following resources were reviewed for additional information on existing conditions relating to biological resources within the BSA:

1. United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) Web Soil Survey (2020)
2. USFWS Critical Habitat Portal (2020a)
3. CDFW Biogeographic Information and Observation System (CDFW 2020b)
4. CDFW Special Vascular Plants, Bryophytes, and Lichens List (2020c)
5. CDFW Special Animals List (2020d)
6. National Wetlands Inventory (NWI) Mapper (2020c)

2.4 Field Reconnaissance Survey

Reconnaissance-level field surveys of the BSA were conducted by Rincon Biologist Brooke Fletcher (on August 20, 21, 25, and 27 and December 16, 2020). A combination of windshield and pedestrian surveys were conducted along the entire project alignment, plus a 100-foot buffer on either side. Land uses, biological habitats and communities, and plant and animal species encountered within the survey area were documented as Appendix C. The project site and buffer areas were also assessed for suitable habitat for special-status plant and wildlife species. Binoculars (10 X 42) were used to aid in visual observations.

Definitive surveys to confirm the presence or absence of special-status species were not performed and are not included with this analysis. Definitive surveys for special-status plant and wildlife species generally require specific survey protocols, extensive field survey time, and are conducted only at specific time periods of the year.

3 Existing Conditions

3.1 Physical Characteristics

Elevations within the BSA range from approximately 330 to 520 feet (100.5 to 158.5 meters) above mean sea level (msl). The climate in this region is characterized by long, dry, hot summers and mild winters. The average high temperature during summer months (June through September) is 94 degrees Fahrenheit (°F) and the average low temperature is 67 °F. The average high temperature during the winter months (December through March) is 61 °F and the average low temperature is 42 °F. Average annual precipitation is only 6.47 inches, with the majority of rainfall occurring during December through March (NOAA 2020). The topography of the BSA is generally flat. The BSA is composed primarily of existing public county roads or private dirt farm roads, surrounded by developed, agricultural lands. The BSA lies between the City of Arvin and the Tehachapi Mountain range, extending northwest near Fuller Acres and southwest towards Meridian.

3.1.1 Watershed and Drainages

The BSA is located in the Middle Kern-Upper Tehachapi watershed (Hydrologic Unit Code [HUC] 18030003), and spans three sub-watersheds: Lake Paulina (HUC 180300030604), Kern Island Canal-Frontal Kern Lake Bed (HUC 180300031201), and Caparell Creek-Frontal Kern Lake Bed (HUC 180300031000) (USEPA 2020a). The NWI identifies the following drainages within the BSA (USFWS 2020c):

Tejon Creek

Tejon Creek begins in the Tehachapi Mountains and flows northwest into the southern portion of the BSA, crossing Edison Rd northeast of Meridian and ending just east of North Wheeler Ridge Rd. The creek is in sub-watershed HUC-180300031000 and is classified by NWI as R2SBCx (Riverine [R], Intermittent [4], Streambed [SB], Seasonally Flooded [C], Excavated (x)).

Caliente Creek

Caliente Creek begins in the Tehachapi Mountains and flows east to west through the northern portion of the BSA before ending just east of Lamont near Malaga Rd. Caliente Creek is in sub-watershed HUC-180300031201, and is classified by NWI as R4SBC (Riverine [R], Intermittent [4], Streambed [SB], Seasonally Flooded [C]).

East Side Canal

East Side Canal runs through the northern and western portions of BSA, east of Lamont, and empties west of Arvin near Malaga Rd. The canal runs through sub-watersheds HUC-180300030604 and HUC-180300031201 and is classified by the NWI as R2UBHx (Riverine [R], Lower Perennial [2], Unconsolidated Bottom [UB], Permanently Flooded [H], Excavated [x]).

Arvin-Edison Canal

Arvin-Edison canal begins northeast of Lamont and runs southeast through the BSA towards Comanche Point before turning southwest and emptying into a collection pond northeast of

Mettler. The canal crosses through sub-watersheds HUC 180300030604, HUC 180300031201, and HUC 180300031000, and is classified by the NWI as R2UBHx (Riverine [R], Lower Perennial [2], Unconsolidated Bottom [UB], Permanently Flooded [H], Excavated [x]).

3.1.2 Soils

The USDA NRCS (2020a) has mapped 17 soil units within the BSA (Figure 4). Five of these soil types underlie the majority of area within the BSA:

1. Granoso loamy sand, 0 to 2 percent slopes
2. Granoso loamy sand, loamy substratum, 0 to 2 percent slopes
3. Delano sandy loam, 0 to 2 percent slopes
4. Hesperia sandy loam, 0 to 2 percent slopes
5. Kimberlina fine sandy loam, 0 to 2 percent slopes MLRA 17

Of the 17 soils mapped within the BSA, ten are on the National Hydric Soils List (USDA NRCS 2020b). Hydric soils can occur in wetlands or other areas with surface or groundwater and may provide habitat for hydrophytic plants, though these soils may also occur in upland areas. The proposed pipeline alignment runs through agriculture areas and roadsides and would occur primarily on non-native fill. Table 1 describes each of the 17 soil units found within the BSA.

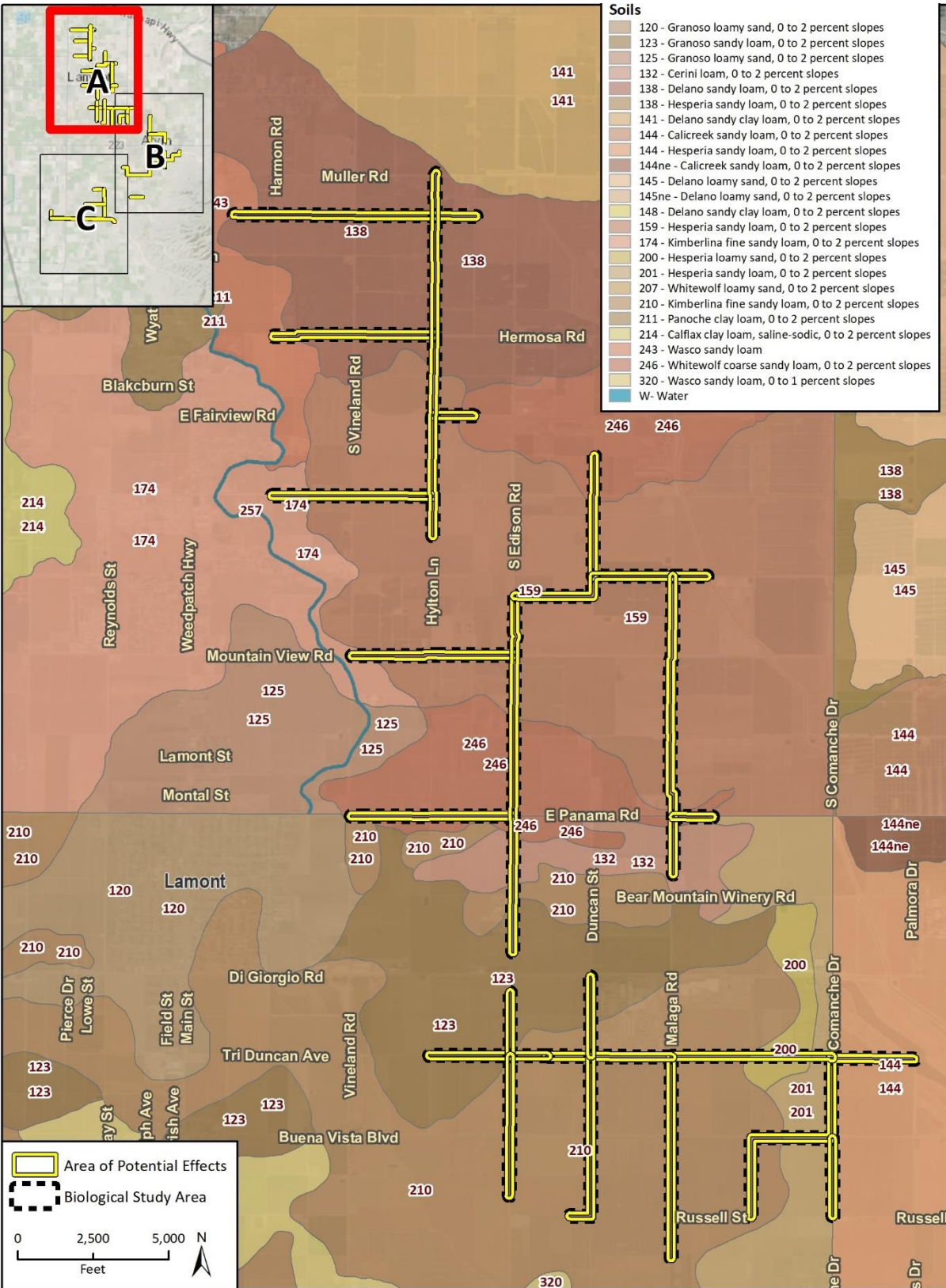
Table 1 Existing Soils Within BSA

Map Unit Symbol	Map Unit Name	Soil Profile	Landform	Parent Material	Drainage	Hydric Soil
101	Bakersfield fine sandy loam, drained, 0 to 1 percent slopes	Fine sandy loam to 16 inches, stratified sand to loam 16 to 45 inches, loam 45 to 51 inches, stratified sandy loam to silt loam 51 to 58 inches, stratified sand to loam 58 to 66 inches	Flood plains	Alluvium derived from granitoid rock	Somewhat poorly drained	Yes
120	Granoso loamy sand, 0 to 2 percent slopes	Loamy sand to 20 inches, sand 20 to 62 inches	Alluvial fans, flood plains	Alluvium derived from mixed rock sources	Somewhat excessively drained	Yes
122	Granoso loamy sand, loamy substratum, 0 to 2 percent slopes	Loamy sand to 20 inches, sand 20 to 36 inches, stratified sandy loam to silt loam 36 to 62 inches	Alluvial fans, flood plains	Alluvium derived from mixed rock sources	Somewhat excessively drained	Yes
123	Granoso sandy loam, 0 to 2 percent slopes, overwash	Sandy loam to 10 inches, loamy sand 10 to 20 inches, sand 20 to 62 inches	Alluvial fans, flood plains	Alluvium derived from mixed rock sources	Somewhat excessively drained	Yes
127	DiGiorgio sandy clay loam, 0 to 2 percent slopes	Sandy clay loam to 60 inches, fine sandy loam 60 to 78 inches	Basin floors, flood plains	Alluvium derived from granite	Well drained	No

Arvin-Edison Water Storage District (AEWSD) Groundwater Service Area (GWSA) Project

Map Unit Symbol	Map Unit Name	Soil Profile	Landform	Parent Material	Drainage	Hydric Soil
132	Cerini loam, 0 to 2 percent slopes	Loam to 24 inches, stratified fine sandy loam to silty clay loam 24 to 47 inches, stratified sandy loam to sandy clay loam 47 to 69 inches	Alluvial fans	Alluvium derived from granitoid rock	Well drained	No
138	Delano sandy loam, 0 to 2 percent slopes	Sandy loam to 11 inches, clay loam 11 to 42 inches, sandy loam 42 to 63 inches	Terraces	Alluvium derived from granite	Well drained	No
144	Hesperia sandy loam, 0 to 2 percent slopes	Sandy loam to 18 inches, fine sandy loam 18 to 34 inches, sandy loam 34 to 70 inches	Alluvial fans	Alluvium derived from granitoid	Well drained	Yes
159	Hesperia sandy loam, 0 to 2 percent slopes	Sandy loam to 33 inches, fine sandy loam 33 to 60 inches	Alluvial fans	Alluvium derived from granitoid	Well drained	Yes
174	Kimberlina fine sandy loam, 0 to 2 percent slopes MLRA 17	Fine sandy loam to 45 inches, silt loam 45 to 71 inches	Alluvial fans	Alluvium derived from igneous and sedimentary rock	Well drained	Yes
200	Hesperia loamy sandy, 0 to 2 percent slopes	Loamy sand to 13 inches, sandy loam 13 to 60 inches	Alluvial fans	Alluvium derived from granitoid	Well drained	Yes
201	Hesperia sandy loam, 0 to 2 percent slopes	Sandy loam to 33 inches, fine sandy loam 33 to 60 inches	Alluvial fans	Alluvium derived from granitoid	Well drained	Yes
203	Whitewolf loamy sand, 2 to 5 percent slopes	Loamy sand to 32 inches, loamy coarse sand 32 to 70 inches	Alluvial fans, flood plains	Alluvium derived from granite	Somewhat excessively drained	No
210	Kimberlina fine sandy loam, 0 to 2 percent slopes MLRA 17	Fine sandy loam to 45 inches, silt loam 45 to 71 inches	Alluvial fans	Alluvium derived from igneous and sedimentary rock	Well drained	No
243	Wasco sandy loam	Sandy loam to 60 inches	Alluvial fans, flood plains	Alluvium derived from granite	Well drained	No
246	Whitewolf coarse sandy loam, 0 to 2 percent slopes	Coarse sandy loam to 11 inches, loamy coarse sand 11 to 65 inches	Alluvial fans, flood plains	Alluvium derived from granitoid rock	Somewhat excessively drained	No
312	Vineland-Bakersfield complex, 0 to 1 percent slopes, drained	Loamy sand to 26 inches, stratified sand to silt loam 26 to 64 inches	Flood plains	Alluvium derived from granitoid rock	Somewhat excessively drained	Yes

Figure 4a Soils



Arvin-Edison Water Storage District
Arvin-Edison Water Storage District (AEWSD) Groundwater Service Area (GWSA) Project

Figure 4b Soils

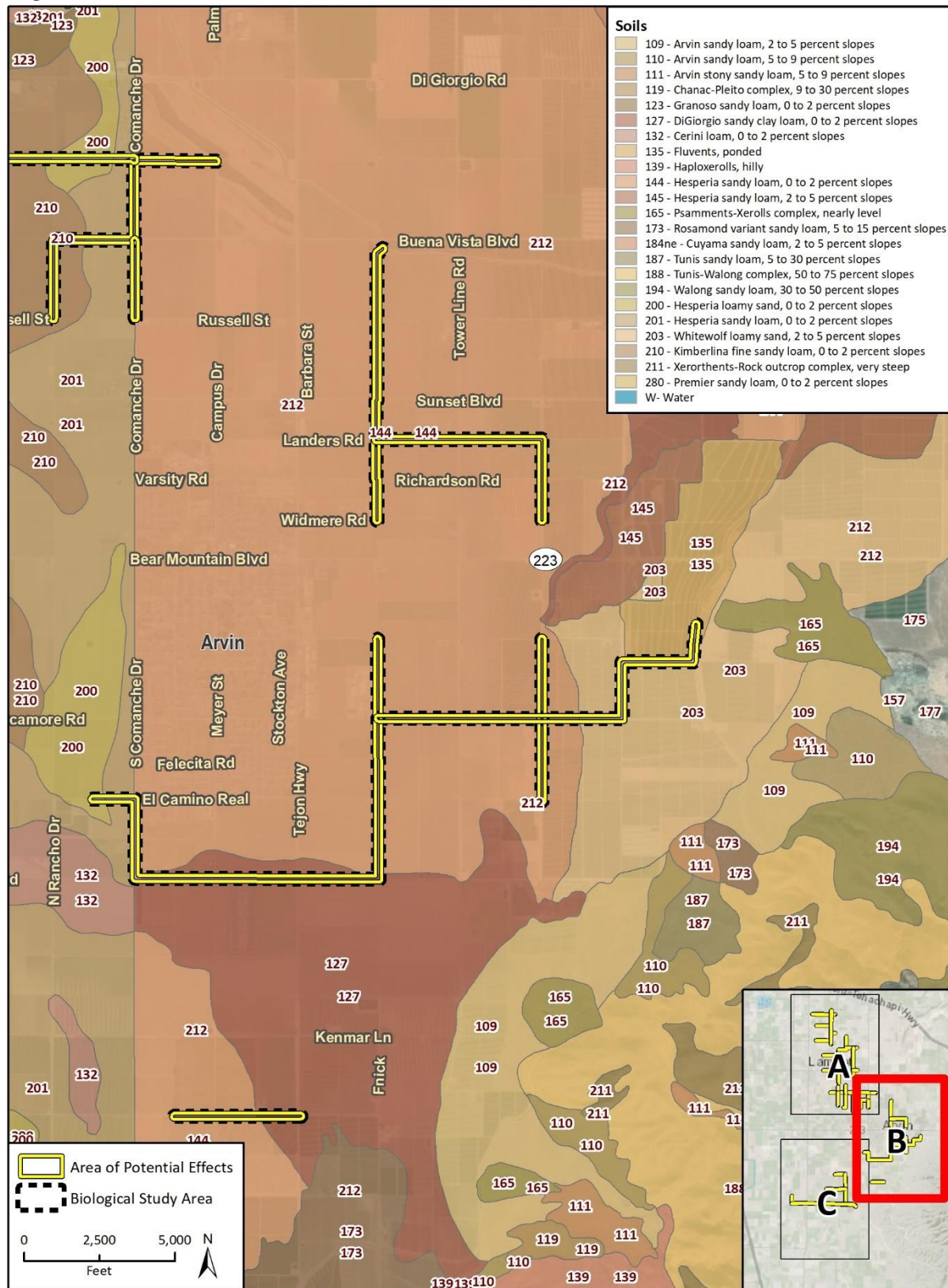
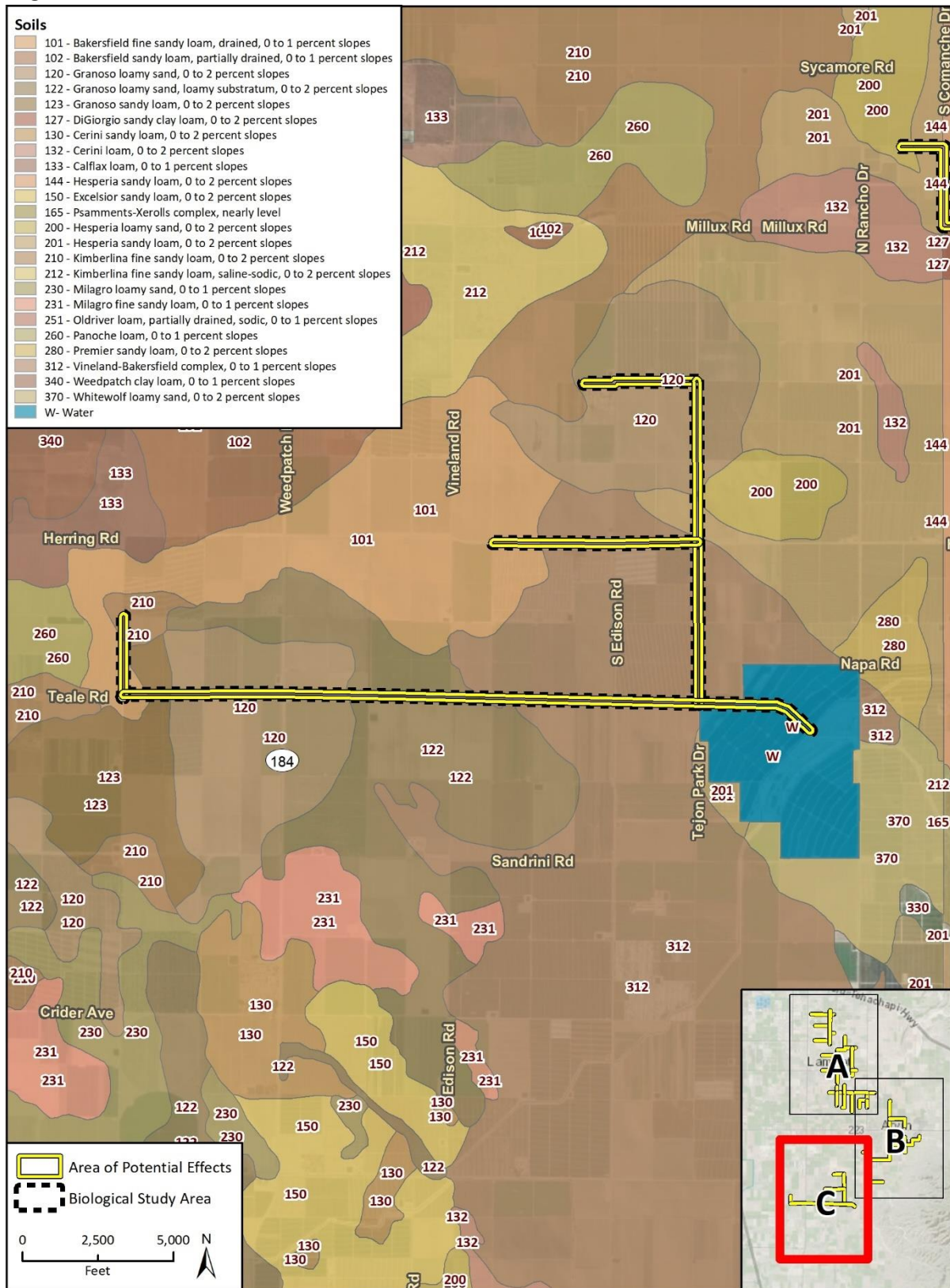


Fig 4 Soils

Figure 4c Soils

3.2 Vegetation and Other Land Cover

The proposed project alignment runs exclusively through previously disturbed areas and no native vegetation communities are present within the BSA. The majority of pipeline installation for the project will occur within existing unpaved agricultural roads or the right of way (ROW) of existing paved roads. The majority of land surrounding the pipeline alignment consists of tilled and cultivated agricultural fields. The following land cover types exist within the BSA: Agriculture, Ruderal, and Developed.

Agriculture

This land cover type is not naturally occurring and is not described in either the Holland (1986) or Sawyer et al. (2009) classification systems. This land cover type within the BSA includes olive, pomegranate, and orange orchards, as well as corn, sorghum, and alfalfa fields that are actively tilled and commercially farmed. Rodenticides, as well as many dead rodents, were widely observed throughout the BSA during the field reconnaissance surveys.

Ruderal

Habitats that have been heavily disturbed or altered such that natural vegetation has largely been removed are considered ruderal areas. These sites do not correspond well with either the Holland (1986) or Sawyer et al. (2009) classification systems. Ruderal land cover exists throughout the BSA, primarily along roadsides and between agricultural fields. Plant species observed during within these areas during field surveys included: wild oats (*Avena fatua*), ripgut brome (*Bromus diandrus*), common purslane (*Portulaca oleracea*), common mustard (*Brassica rapa*), Bermuda grass (*Cynodon dactylon*), pigweed amaranth (*Amaranthus albus*), Russian thistle (*Salsola tragus*), and puncture vine (*Tribulus terrestris*). Representative photos of the proposed alignment and BSA can be found in Appendix B, and a complete list of all plant species observed during field reconnaissance surveys can be found in Appendix C.

Developed

This land cover type is not naturally occurring and is not described in either the Holland (1986) or Sawyer et al. (2009) classification systems. Developed land consists of areas that have been modified such that most or all native vegetation has been removed and only small areas of landscaped vegetation are present. Developed portions of the BSA include paved roads and highways, as well as residential neighborhoods within the city of Arvin.

3.3 General Wildlife

Wildlife observed within the BSA during field reconnaissance surveys consisted primarily of disturbance-tolerant species common within urban and agricultural areas. One CDFW-Watch List (WL) species, Cooper's hawk (*Accipiter cooperii*), was observed within the BSA. Other avian species observed included American crow (*Corvus brachyrhynchos*), Anna's hummingbird (*Calypte anna*), black phoebe (*Sayornis nigricans*), killdeer (*Charadrius vociferous*), great horned owl (*Bubo virginianus*), red-tailed hawk (*Buteo jamaicensis*), mourning dove (*Zenaida macroura*) and western kingbird (*Tyrannus verticalis*).

Reptile species observed during the surveys included side-blotched lizard (*Uta stansburiana*), San Joaquin fence lizard (*Sceloporus occidentalis biseriatus*), and Gilbert's skink (*Plestiodon gilberti*).

Mammalian species observed included California ground squirrel (*Otospermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), coyote (*Canis latrans*), black-tailed jackrabbit (*Lepus californicus*), raccoon (*Procyon lotor*), and desert cottontail (*Sylvilagus audubonii*).

4 Sensitive Biological Resources

Local, State, and federal agencies regulate special-status species and other sensitive biological resources and require an assessment of their presence or potential presence to be conducted on-site prior to the approval of proposed development on a property. This section discusses sensitive biological resources observed within the BSA, and evaluates the potential for the project site to support additional sensitive biological resources. Assessments for the potential occurrence of special-status species are based upon known ranges, habitat preferences for the species, species occurrence records from the CNDDDB, species occurrence records from other sites in the vicinity of the survey area, previous reports for the project site, and the results of surveys of the project site. The potential for each special-status species to occur in the BSA was evaluated according to the following criteria:

- **Not Expected.** Habitat on and adjacent to the site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime), and species would have been identifiable on-site if present (e.g., oak trees). Protocol surveys (if conducted) did not detect species.
- **Low Potential.** Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site. Protocol surveys (if conducted) did not detect species.
- **Moderate Potential.** Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.
- **High Potential.** All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.
- **Present.** Species is observed on the site or has been recorded (e.g., CNDDDB, other reports) on the site recently (within the last 5 years).

4.1 Special-status Species

4.1.1 Special-status Plant Species

Based on the CNPS query of the project area and surrounding twenty USGS quads, 37 special-status plant species were evaluated for their potential to occur within the BSA (Appendix D). No special-status plant species were observed during the field reconnaissance survey. Based on these observations, the lack of suitable habitat, and the intensive agricultural activity predominant in the area, no special-status plant species are expected to occur within the BSA.

4.1.2 Special-status Animal Species

Based on the CNDDDB query of the project area and the surrounding twenty USGS quads, 36 special-status animal species were evaluated for their potential to occur within the BSA (Appendix D). Of these, 24 are not expected to occur, based on CNDDDB occurrence records and lack of species-specific suitable habitat. Seven special-status animal species have a low potential to occur, two have

a moderate potential to occur, two have a high potential to occur, and one CDFW WL species, Cooper's hawk (*Accipiter cooperii*), was present within the BSA at the time of the field survey. Table 2 provides a list of all special-status animal species with potential to occur within the project area as well as their status. Each of these species is discussed in further detail below.

Table 2 Special-status Animals with Potential to Occur within the BSA

Common Name	Scientific Name	Status
Low Potential to Occur		
Blunt-nosed leopard lizard	<i>Gambelia sila</i>	FE, SE
California glossy snake	<i>Arizona elegans occidentalis</i>	SSC
Coast horned lizard	<i>Phrynosoma blainvillii</i>	SSC
Nelson's antelope squirrel	<i>Ammospermophilus nelsoni</i>	ST
San Joaquin coachwhip	<i>Masticophis flagellum ruddocki</i>	SSC
Tehachapi pocket mouse	<i>Perognathus alticola inexpectatus</i>	SSC
Tipton kangaroo rat	<i>Dipodomys nitratoideus nitratoideus</i>	FE, SE
Moderate Potential to Occur		
American badger	<i>Taxidea taxus</i>	SSC
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	FE, ST
High Potential to Occur		
Burrowing owl	<i>Athene cunicularia</i>	SSC
Swainson's hawk	<i>Buteo swainsoni</i>	ST
Present		
Cooper's hawk	<i>Accipiter cooperii</i>	WL
SSC = CDFW Species of Special Concern SE = State Endangered ST = State Threatened		
FE = Federal Endangered FT = Federal Threatened WL = Watch List		

Blunt-Nosed Leopard Lizard

Blunt-nosed leopard lizard is a federally endangered and State endangered species. The species is found in sparsely vegetated alkali and desert scrub habitats, in areas of low topographic relief. Blunt-nosed leopard lizards cover in mammal burrows, or beneath shrubs or structures such as fence posts and do not excavate their own burrows. The species is diurnal and feeds on insects and small lizards. Breeding occurs from May to June, eggs are laid in June and July and hatch in late summer (Nafis 2020).

There are twelve known occurrences of blunt-nosed leopard lizard recorded in the CNDDDB within five miles of the BSA, one of which occurs within the BSA, just southeast of Arvin. This observation occurred in 1991, however, and there are no documented occurrences within the BSA since that time. There is some suitable burrow habitat for the species within the BSA, but the heavy agriculture in the area has left little to no suitable scrub habitat for the species. The blunt-nosed leopard lizard has a low potential to occur within the BSA.

California Glossy Snake

California glossy snake is a CDFW Species of Special Concern (SSC) found in a range of scrub and grassland habitats, often with loose or sandy soils. The species is nocturnal and hides underground beneath rocks during the daytime. California glossy snakes are typically active from late February

through November and are most active in May. Prey species include small lizards, snakes, birds, and mammals. Females typically lay 5 to 12 eggs during June and July, which typically hatch in late summer and early fall (Nafis 2020).

There are eight known occurrences of the California glossy snake recorded in the CNDDDB within five miles of the BSA. Some suitable sandy soil habitat exists within the BSA. The California glossy snake has a low potential to occur within the BSA.

Coast Horned Lizard

Coast horned lizard is a CDFW SSC that is found in grasslands, coniferous forests, woodlands, and chaparral, in open areas of sandy or loose soil. Horned lizards are active above-ground between April and October, with most activity concentrated between April and June. During the remainder of the year they aestivate underground in mammal burrows or rock crevices or beneath objects such as boulders and logs. Horned lizard diets are specialized and almost exclusively consist of native ants (Suarez et al. 2000).

There are currently no CNDDDB records for the coast horned lizard within five miles of the BSA. However, the BSA is within the known range of the species and sandy soils are present within the BSA. The species has low potential to occur anywhere in the BSA with suitable sandy open areas but is unlikely to occur in the more developed segments where dispersal barriers (roads, agriculture and residential development, etc.) reduce the ability for the species to access isolated patches of suitable habitat. The coast horned lizard has a low potential to occur within the BSA.

Nelson's Antelope Squirrel

Nelson's antelope squirrel is State threatened species and occurs in the Western San Joaquin Valley from 200-1200 feet on dry, sparsely vegetated loam soils. The species needs widely scattered shrubs, forbs, and grasses in broken terrain with gullies and washes. The species is omnivorous, and diet depends on food availability. Nelson's antelope squirrels can dig their own burrows, but often use existing kangaroo rat burrows. The squirrels are active year-round, and the breeding season is from late winter to early spring (Zeiner et al. 1988).

There are currently no CNDDDB records for Nelson's antelope squirrel within five miles of the BSA. However, the project falls within the known range for the species and some suitable burrow habitat for the species exists within the BSA. Nelson's antelope squirrel has a low potential to occur within the BSA.

San Joaquin Coachwhip

San Joaquin coachwhip is a CDFW SSC found in valley grassland and saltbush scrub in the San Joaquin Valley in areas with little or no tree cover. The snake requires mammal burrows for refuge and oviposition sites but is active during the daytime and able to tolerate high temperatures (Nafis 2000). Diet includes small mammals, birds, eggs, other reptiles, and carrion. Breeding occurs in May and eggs are laid in early summer (Stebbins 2003).

There is one known occurrence of San Joaquin coachwhip recorded in the CNDDDB within five miles of the BSA. Suitable grassland and scrub habitat for the species is very limited within the BSA. The San Joaquin coachwhip has a low potential to occur within the BSA.

Tehachapi Pocket Mouse

The Tehachapi pocket mouse is a CDFW SSC found in arid annual grassland and desert shrub communities. The species can also inhabit fallow grain fields with loose soils and uses burrows for cover and nesting. The Tehachapi pocket mouse forages on open ground and beneath shrubs and aestivates and hibernates during extreme weather (CSU Stanislaus 2020).

There are currently no CNDDDB records for Tehachapi pocket mouse within five miles of the BSA. However, the project falls within the known range for the species and some suitable burrow habitat for the species exists within the BSA. The Tehachapi pocket mouse has a low potential to occur within the BSA.

Tipton Kangaroo Rat

The Tipton kangaroo rat is federally endangered and State endangered species. It is found within saltbush scrub and sink scrub communities in the Tulare Lake Basin of the southern San Joaquin Valley. The Tipton kangaroo rat needs soft friable soils which escape seasonal flooding and digs burrows in elevated soil mounds at bases of shrubs. Diet consists primarily of seeds but may also include herbaceous vegetation and insects. Reproduction occurs during the winter months (CSU Stanislaus 2020).

There are currently no CNDDDB records for Tipton kangaroo rat within five miles of the BSA. However, the project falls within the known range for the species and some suitable burrow habitat for the species exists within the BSA. The Tipton kangaroo rat has a low potential to occur within the BSA.

American Badger

American badger is a CDFW SSC that is found in dry, open habitats including grassland and open woodland. It is a highly specialized, semi-fossorial mustelid (Quinn 2008). Suitable burrowing habitat requires dry, sandy soil. The species is most abundant in drier open stages of most shrub, forest, and herbaceous habitats with suitable soils to support burrows (Zeiner et al. 1990). Breeding occurs in summer and early fall, with young being born from March to April.

There are five known occurrences of American badger recorded in the CNDDDB within five miles of the BSA. Sandy, friable soils within the BSA provide suitable habitat for this species. The American badger has a moderate potential to occur within the BSA.

San Joaquin Kit Fox

San Joaquin kit fox is a federally endangered and State threatened species that occurs in annual grasslands or grassy open stages with scattered shrubby vegetation within the San Joaquin Valley. The species requires loose-textured sandy soils for burrowing, and preys primarily on small mammals. Breeding can occur from December to March, and pups are born after a 48-52 day gestation period (EPA 2020b).

There are 16 known occurrences of San Joaquin kit fox recorded by the CNDDDB within five miles of the BSA. Typical denning or foraging habitat is not present within the BSA, but the site could be used for satellite dens during dispersal. The San Joaquin kit fox has a moderate potential to occur within the BSA. Multiple burrows of sufficient size to accommodate San Joaquin kit fox were detected during site surveys. This species may use dry-land agriculture, fallow agricultural fields, and adjacent grasslands for foraging; however, the low abundance of prey and the presence of coyote predators

makes the site marginal as foraging habitat. The species may occur within the BSA irregularly during dispersal or migratory movements.

Burrowing Owl

Burrowing owl is a CDFW SSC that occupies open, treeless areas within grassland, low density scrub, and desert biomes. This species generally inhabits gently-sloping areas, characterized by low, sparse vegetation, and is often associated with high densities of burrowing mammals (Poulin et al. 2011). Burrowing owl often uses relatively disturbed areas such as agricultural fields, golf courses, cemeteries, and vacant urban lots in addition to natural breeding habitats. Nests are most often in fossorial animal burrows, such as California ground squirrel or American badger, but atypical nests such as culverts or rubble piles may also be used. Nest sites are typically selected in an area with a high density of burrows (Cornell Lab of Ornithology 2020).

There are twenty-two known occurrences of burrowing owl recorded in the CNDDDB within five miles of the BSA. Suitable habitat is present in open spaces with loose soils and existing burrows throughout the BSA. The burrowing owl has a high potential to occur within the BSA.

Swainson's Hawk

Swainson's hawk is a State threatened species that breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. The species requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations. Prey species include squirrels, mice, voles, rabbits, and insects. Nests are typically built in solitary trees or small groves of trees near streams (Cornell Lab of Ornithology 2020).

There are three known occurrences of Swainson's hawk recorded in the CNDDDB within five miles of the BSA. Suitable foraging habitat for the species exists within the BSA, and a small number of ornamental trees are located within the BSA that could serve as suitable nesting habitat. Swainson's hawk has a high potential to occur within the BSA.

Cooper's hawk

Cooper's hawk is a CDFW Watch List species that typically inhabits woodlands and forest edges but can also be found in urban parks and neighborhoods where trees are present. Nests are built 25-50 feet high in a variety of tree species, including pines, oaks, beeches, and spruces. Nests are made of sticks and are often lined with bark flakes and green twigs. Cooper's hawks are aerial predators that feed primarily on medium-sized birds, such as mourning dove (*Zenaida macroura*), American robin (*Turdus migratorius*), California quail (*Callipepla californica*), and European starling (*Sturnus vulgaris*). In addition to preying on adult birds, Cooper's hawks will also occasionally rob nests and hunt rabbits, rodents, and bats.

A Cooper's hawk was observed within the BSA during the field reconnaissance survey on August 21, 2020 and is therefore present within the project area. Orchard trees and surrounding fields within the BSA provide suitable foraging habitat for the species, and ornamental trees within and around the BSA could provide suitable nesting habitat for the species.

4.1.3 Other Protected Species

Nesting Birds

Non-game migratory birds protected under the Migratory Bird Treaty Act (MBTA) and the California Fish and Game Code (CFG) Section 3503, such as native avian species common to agricultural, developed and ruderal areas, have the potential to breed and forage throughout the BSA. Species of birds that typically occur in the region, such as red-tailed hawk, mourning dove, American crow, and killdeer may nest within the BSA or adjacent areas. Ornamental trees (such as *Eucalyptus spp.* and salt cedar) occur within and adjacent to the BSA and could provide suitable nesting habitat for raptor species, including Swainson's hawk. Orchard trees within and adjacent to the BSA could also provide suitable nesting habitat for passerine species. Owl boxes located throughout the BSA could provide nesting habitat for species such as barn owls and great horned owls, both of which were observed during the field reconnaissance surveys.

4.2 Sensitive Plant Communities and Critical Habitats

Based on the CNDDDB query, there are six sensitive plant communities known to occur within a five-mile radius of the project area. These include: Great Valley Cottonwood Riparian Forest, Stabilized Interior Dunes, Valley Needlegrass Grassland, Valley Oak Woodland, Valley Saltbrush Scrub, and Valley Sink Scrub, as defined by *A Manual of California Vegetation, Second Edition* (Sawyer et al. 2009). None of these communities were observed within the BSA during the field reconnaissance surveys, and due to extensive agriculture and other development, none of these sensitive communities have any potential to occur within the BSA.

There is no designated Critical Habitat located within the BSA (USFWS 2020a).

4.3 Jurisdictional Waters and Wetlands

According to the NWI, the following waters and wetlands exist within the BSA that could potentially fall under federal and/or State jurisdiction:

Tejon Creek

Tejon Creek begins in the Tehachapi Mountains and flows northwest into the southern portion of the BSA, crossing Edison Rd northeast of Meridian and ending just east of North Wheeler Ridge Rd. The creek is classified by NWI as R2SBCx (Riverine [R], Intermittent [4], Streambed [SB], Seasonally Flooded [C], Excavated [x]).

Caliente Creek

Caliente Creek begins in the Tehachapi Mountains and flows east to west through the northern portion of the BSA before ending just east of Lamont near Malaga Rd. Caliente Creek is classified by NWI as R4SBC (Riverine [R], Intermittent [4], Streambed [SB], Seasonally Flooded [C]).

East Side Canal

East Side Canal runs through the northern and western portions of BSA, east of Lamont, and empties west of Arvin near Malaga Rd. The canal is classified by the NWI as R2UBHx (Riverine [R], Lower Perennial [2], Unconsolidated Bottom [UB], Permanently Flooded [H], Excavated [x]).

Arvin-Edison Canal

Arvin-Edison canal begins northeast of Lamont and runs southeast through the BSA towards Comanche Point before turning southwest and emptying into a collection pond northeast of Mettler. The canal is classified by the NWI as R2UBHx (Riverine [R], Lower Perennial [2], Unconsolidated Bottom [UB], Permanently Flooded [H], Excavated [x]).

Unnamed Drainage

An unnamed drainage lies near the center of the project area, running parallel to Millux Road and crossing North Rancho Drive and South Edison Road. The NWI classifies this unnamed drainage as R5UBF (Riverine [R], Unknown Perennial [5], Unconsolidated Bottom [UB], Semipermanently Flooded [F]).

Unnamed Wetland area associated with unnamed drainage

An unnamed wetland area associated with the above unnamed drainage lies just northwest of the intersection of South Edison Road and Millux Road. The NWI classifies this Freshwater Forested/Shrub Wetland habitat as PSSCh (Palustrine [P], Scrub-Shrub [SS], Seasonally Flooded [C], Diked/Impounded [h]).

Unnamed lake associated with Arvin-Edison Canal

Approximately 386 acres of artificially flooded lake habitat associated with the Alvin-Edison Canal exists within the eastern portion of the BSA, along Highway 223. It is used by the AEWSD as a groundwater recharge basin and is classified by the NWI as L2USKx (Lacustrine [L], Littoral [2], Unconsolidated Shore [US], Artificially Flooded [K], Excavated [x]).

Unnamed lake associated with Tejon Creek

Approximately 550 acres of artificially flooded lake habitat associated with Tejon Creek lies within the southeastern portion of the BSA, along North Rancho Drive. It is used by the AEWSD as a groundwater recharge basin and is classified by the NWI as L2USKx (Lacustrine [L], Littoral [2], Unconsolidated Shore [US], Artificially Flooded [K], Excavated [x]).

Freshwater Emergent Ponds

Multiple small (less than 2 acre) agricultural ponds exist within the BSA, which are classified by the NWI as PUBFx (Palustrine [P], Unconsolidated Bottom [UB], Semipermanently Flooded [F], Excavated [x]).

Freshwater Emergent Wetlands

Multiple small (less than 2 acre) excavated wetland areas exist within the BSA, which are classified by the NWI as PEM1Fx (Palustrine [P], Emergent [EM], Persistent [1], Semipermanently Flooded [F], Excavated [x]).

4.4 Wildlife Movement

Wildlife movement corridors, or habitat linkages, are generally defined as connections between habitat patches that allow for physical and genetic exchange between otherwise isolated animal populations. Such linkages may serve a local purpose, such as providing a linkage between foraging

and denning areas, or they may be regional in nature. Some habitat linkages may serve as migration corridors, wherein animals periodically move away from an area and then subsequently return. Others may be important as dispersal corridors for young animals. A group of habitat linkages in an area can form a wildlife corridor network. The California Essential Habitat Connectivity Project commissioned by the California Department of Transportation (Caltrans) and CDFW; identifies “Natural Landscape Blocks” which support native biodiversity and the “Essential Connectivity Areas” which link them (Spencer et al. 2010).

One Essential Connectivity Area (ECA) is mapped in BIOS (CDFW 2020b) east of the City of Arvin, which overlaps with the easternmost portion of the BSA. The ECA connects the Sierra Nevada Foothills and Great Central Valley. Several small segments of the pipeline alignment (less than 0.5 miles in total length) fall within the ECA near Sycamore Road.

Wildlife movement corridors can be both large and small in scale. Riparian corridors and waterways associated with Tejon Creek, Caliente Creek, and East Side Canal provide local scale opportunities for wildlife movement throughout the BSA. Existing roads within the BSA also act as corridors for wildlife movement, particularly for relatively disturbance-tolerant species such as desert cottontail, coyote, raccoon, skunk, deer, and bobcat. Most of the alignment segments are located along existing roads and agricultural land near the cities of Arvin, Lamont, and Fuller Acres. There is less potential for wildlife movement in these areas due to their proximity to developed and intensively farmed areas.

There are many open spaces within and around the BSA that occur in patches within existing development, but these areas are almost entirely agricultural. Movement between these areas can occur on roads or within undeveloped areas and orchards scattered throughout the BSA. However, these areas are not considered ECAs and most wildlife species that would utilize such connections are likely to be urban, disturbance-tolerant species such as raccoon, skunk, opossum, and coyote. California ground squirrels are likely to use these areas as a small local corridor for movement as well.

Although small portions of the project alignment are mapped within an ECA, the region is dominated by agricultural production and subject to frequent disturbance which would impede or deter dispersal and migratory movements. Additionally, the proposed alignment does not contain features, such as riparian vegetation, that are typically associated with wildlife movement corridors. Furthermore, project activities do not include the placement of fencing or any other barriers to wildlife, and all project impacts will be temporary. Therefore, the proposed project activities would not significantly impede wildlife movement.

4.5 Habitat Conservation Plans

Metropolitan Bakersfield Habitat Conservation Plan

The northern part of the BSA lies within the Metropolitan Bakersfield Habitat Conservation Plan (MBHCP), between East Panama Lane and Muller Road. The MBHCP provides the framework for special-status species and habitat conservation in the Metropolitan Bakersfield area and sets goals and policies that must be met for projects to obtain a discretionary permit for grading, building, or developing lands within the MBHCP jurisdiction.

This project does not include any grading or building or involve the conversion or development of any lands. As such, a discretionary development permit is not required, and project activities do not

constitute covered activities under the MBHCP. The project is therefore not required to comply with the goals and policies of the MBHCP.

5 Impact Analysis and Mitigation Measures

This section provides a project-specific analysis of potential impacts that could result from proposed project activities and resource-specific mitigation measures recommended for reducing these impacts, where applicable. This impact analysis is based on potential impacts within the project area and a 100-foot buffer (BSA).

5.1 Special-status Species

The proposed project would have a significant effect on biological resources if it would:

- 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.*

Special-status Plants

No special-status plant species have potential to occur within the BSA. Therefore, the project is not expected to have a significant impact on any special-status plant species.

Special-status Wildlife

Construction activity associated with the project could include vegetation removal, trenching, pipe installation, equipment and vehicle staging, parking, construction noise and construction staging. These activities have the potential to directly impact special-status wildlife species and/or their habitat. Wildlife species may be injured or killed by construction activity if present during construction. Wildlife present in the project area or in adjacent areas could be impacted by construction noise and activity if that activity causes individuals to abandon breeding activity, disrupts foraging behavior, or increases competition for resources. Many of the special-status animal species with potential to occur within the BSA rely on burrow habitat, and burrows present within the project area could also be impacted by project activities.

Special-status animal species with a low potential to occur within the BSA include blunt-nosed leopard lizard, California glossy snake, coast horned lizard, Nelson's antelope squirrel, San Joaquin coachwhip, Tehachapi pocket mouse, and Tipton kangaroo rat. Special-status animal species with moderate potential to occur within the BSA include American badger and San Joaquin kit fox. Special-status animal species with a high potential to occur within the BSA include burrowing owl and Swainson's hawk. A Cooper's hawk was observed within the BSA during the field reconnaissance surveys and is therefore present.

Suitable habitat for nesting birds exists within the BSA and adjacent areas and should project activities occur during nesting bird season (February 1 through September 15), then vegetation removal and noise associated with construction activities could significantly impact nesting special-status birds, as well as nesting birds protected by the MBTA and CFGC.

The following mitigation measures are recommended to reduce potential impacts to special-status wildlife species to less than significant.

Mitigation Measures for Special-status Wildlife Species

BIO-1(a) Worker Environmental Awareness Program (WEAP)

Prior to initiation of construction activities (including staging and mobilization), all personnel associated with project construction shall attend WEAP training, conducted by a qualified biologist, to aid workers in recognizing special-status resources that may occur in the construction area. The specifics of this program shall include identification of the sensitive species, a description of the regulatory status and general ecological characteristics of sensitive resources, and review of the limits of construction and mitigation measures required to reduce impacts to biological resources within the work area. A fact sheet conveying this information shall also be prepared for distribution to all contractors, their employers, and other personnel involved with construction. All employees shall sign a form provided by the trainer indicating they have attended the WEAP and understand the information presented to them.

BIO-1(b) General Wildlife Pre-construction Surveys

Pre-construction clearance surveys for all special-status wildlife species shall be conducted within 30 days prior to the start of construction (including staging and mobilization) in areas of suitable habitat. The surveys shall cover the entire disturbance footprint plus a minimum 100-foot buffer within suitable habitat, where permissible, and should identify all special-status animal species that may occur on-site. Any non-listed special-status animals observed within the project area during the survey should be relocated by a qualified biologist to a safe location within suitable habitat as near to the project area as possible. If listed species that utilize burrows, such as blunt-nosed leopard lizard, Tipton kangaroo rat, and Nelson's antelope squirrel are detected during the preconstruction survey, all suitable burrows will be flagged for avoidance by a minimum distance of 50 feet, as described in BIO-1(c) below. If listed avian species, such as Swainson's hawk are detected during the preconstruction survey, active nests shall be protected with a disturbance-free buffer as described in BIO-1(f) below. If San Joaquin kit fox individuals or known or potential dens are detected during the preconstruction survey, dens will be monitored and protected with a disturbance-free buffer, as described in BIO-1(e) below. If complete avoidance of listed species and their nests, dens, or burrows is infeasible, the project proponent shall immediately contact CDFW and USFWS regarding incidental take permits.

BIO-1(c) Focused Burrow Survey

Concurrent with the general wildlife pre-construction survey described above, a qualified biologist shall conduct a focused burrow survey within 30 days prior to the initiation of ground disturbance. All burrows within the proposed project pipeline alignments will be inspected for the potential presence of special-status animal species that utilize burrows, including American badger, Nelson's antelope squirrel, Tipton kangaroo rat, blunt-nosed leopard lizard, San Joaquin coachwhip, and coast horned lizard. If no special-status species are suspected to occupy any burrows within the project alignment, no further actions are required. If any special-status species, or their sign, are detected within burrows during the pre-construction burrow survey, then those burrows should be mapped and flagged for avoidance by minimum distance of 50 feet. If complete avoidance of burrows potentially occupied by a listed species is infeasible, the project proponent shall immediately contact CDFW and USFWS regarding incidental take permits.

BIO-1 (d) Mitigation Measures for Burrowing Owl

A qualified biologist shall conduct pre-construction surveys prior to ground disturbance activities to confirm the presence/absence of burrowing owls. Pre-construction surveys shall be conducted during the appropriate time of day to maximize detectability within 30 days prior to construction and ground disturbance activities. If no burrowing owls are observed, no further actions are required. If burrowing owls are detected during the pre-construction clearance surveys, the following measures shall apply:

- Avoidance buffers during the breeding and non-breeding season should be implemented in accordance with the CDFW (2012) and Burrowing Owl Consortium (1993) minimization mitigation measures.
- If avoidance of burrowing owls is not feasible, then additional measures such as passive relocation during the nonbreeding season should be implemented, in consultation with CDFW. In addition, a Burrowing Owl Exclusion Plan and Mitigation and Monitoring Plan will be developed by a qualified biologist in accordance with the CDFW (2012) and Burrowing Owl Consortium (1993).

BIO-1 (e) Mitigation Measures for San Joaquin Kit Fox

- A pre-construction clearance survey for San Joaquin kit fox shall also be conducted not less than 14 days and not more than 30 days prior to the initiation of ground-disturbing activities. The survey areas shall include the entire study area and all accessible undeveloped habitat within 200 feet, in accordance with the USFWS 2011 Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance. If any known or potential dens are detected, the den(s) shall be monitored for a minimum of three consecutive nights with remote-sensing cameras or tracking medium to evaluate current use. If San Joaquin kit fox use is observed, the den should be avoided by the recommended buffers outlined in the USFWS 2011 Standardized Recommendations, and the project proponent shall immediately notify USFWS and CDFW regarding incidental take permits.
- Construction activities shall adhere to the avoidance and minimization measures outlined in the USFWS 2011 Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance, outlined below:
 - Project-related vehicles should observe a 20-mph speed limit in all study areas, except on county roads and State and Federal highways; this is particularly important at night when kit foxes are most active. To the extent possible, night-time construction should be minimized. Off-road traffic outside of designated study areas should be prohibited.
 - To prevent inadvertent entrapment of kit foxes or other animals during the construction phase of a project, all excavated, steep-walled holes or trenches more than 2 feet deep should be covered at the close of each working day by plywood or similar materials or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they should be thoroughly inspected for trapped animals. If at any time a trapped or injured kit fox is discovered, the USFWS should be notified within three days of the discovery.
 - All food-related trash items such as wrappers, cans, bottles, and food scraps should be disposed of in closed containers and removed at least once a week from a construction or project site.
 - No firearms or pets should be allowed on the project site.

- Use of rodenticides and herbicides in study areas should be restricted. This is necessary to prevent primary or secondary poisoning of kit foxes and the depletion of prey populations on which they depend. All uses of such compounds should observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Food and Agriculture, and other State and Federal legislation, as well as additional project-related restrictions deemed necessary by the Service. If rodent control must be conducted, zinc phosphide should be used because of proven lower risk to kit fox.

BIO-1 (f) Mitigation Measures for Swainson's Hawk, Cooper's Hawk, and Nesting Birds

Ground disturbance and vegetation removal activities shall be restricted to the non-breeding season (September 16 to January 31) when feasible. For ground disturbance and vegetation removal activities occurring during the bird nesting season (February 1 to September 15), general pre-construction nesting bird surveys shall be conducted by a qualified biologist (including for, but not limited to, Cooper's hawk and Swainson's hawk), within 30 days prior to the initiation of construction activities. Surveys shall include the disturbance area plus a 200-foot buffer for passerine species, a 500-foot buffer for raptors, and a 0.5-mile buffer for Swainson's hawk. If active nests are located, an appropriate avoidance buffer shall be established within which no work activity will be allowed which would impact these nests. The avoidance buffer would be established by the qualified biologist on a case-by-case basis based on the species and site conditions. In no cases should the buffer be smaller than 50 feet for non-raptor bird species or 200 feet for raptor species. Larger buffers may be required depending upon the status of the nest and the construction activities occurring in the vicinity of the nest. If State-listed threatened Swainson's hawks are documented nesting within 500 feet of construction activities, CDFW should be consulted on appropriate avoidance and minimization methods. The buffer area(s) should be closed to all construction personnel and equipment until juveniles have fledged and/or the nest is inactive. A qualified biologist should confirm that breeding/nesting is complete, and the nest is no longer active prior to removal of the buffer. If work within a buffer area cannot be avoided, then a qualified biologist will be present to monitor all project activities that occur within the buffer. The biological monitor will evaluate the nesting avian species for signs of disturbance and will have the ability to stop work.

5.2 Sensitive Plant Communities and Critical Habitat

The proposed project would have a significant effect on biological resources if it would:

- b. Have a substantial adverse impact 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 US Fish and Wildlife Service.*

There are no sensitive plant communities, including riparian habitat, and no designated critical habitat within the project area or surrounding 100-foot buffer. Therefore, there will be no impact on sensitive plant communities or critical habitats and no additional measures are recommended.

5.3 Jurisdictional Waters and Wetlands

The proposed project would have a significant effect on biological resources if it would:

- c. *Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.*

The proposed project alignment intersects the following potentially jurisdictional waterways: Tejon Creek, Caliente Creek, East Side Canal, Arvin-Edison Canal, an unnamed agricultural drainage that runs parallel to Millux Road, an unnamed wetland area associated the unnamed drainage, two unnamed lakes used for groundwater recharge by the AEWS, and multiple freshwater emergent ponds and wetlands excavated for agricultural purposes. The entire proposed pipeline installation alignment occurs along existing roads and previously disturbed areas and impacts to waterways should be minimal. Avoidance of potentially jurisdictional waterways is recommended, where feasible. Should avoidance of these waterways be unavoidable, then federal and/or State jurisdiction would be determined during a formal jurisdictional delineation performed by a qualified biologist. Impacts and specific mitigation measures would then be decided by agencies determined to have jurisdiction.

Mitigation Measures for Jurisdictional Waters and Wetlands

BIO-2 Jurisdictional Delineation

The project shall be designed to avoid potentially jurisdictional aquatic features where feasible. If impacts to potentially jurisdictional features are unavoidable, the project proponent shall retain a qualified biologist to conduct a jurisdictional delineation to determine the extent of CDFW, USACE, and/or RWQCB jurisdiction. The delineation will be conducted in accordance with the requirements set forth by each agency. If the delineation determines that the project will result in impacts to a water of the State, then the project proponent shall submit an application to RWQCB for a Waste Discharge Requirements (WDR) permit and/or Section 401 Water Quality Certification (depending upon whether or not the feature also falls under federal jurisdiction). If the delineation determines that the project will result in impacts to features considered within CDFW's jurisdiction, then the project proponent will submit a Notification of Lake or Streambed Alteration Agreement pursuant to Section 1600 et seq. of the CFGC. If the delineation determines that the project will result in impacts to a water of the U.S., the project proponent shall submit a permit application to USACE, pursuant to Section 404 of the CWA. The project proponent shall abide by all permit conditions, and compensatory mitigation for all impacts to waters of the U.S., waters of the State and features subject to CDFW jurisdiction shall be completed at the ratio required in the applicable permits.

5.4 Wildlife Movement

The proposed project would have a significant effect on biological resources if it would:

- d. *Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors, or impede the use of wildlife nursery sites.*

There are no Natural Landscape Blocks mapped within the BSA. The project alignment overlaps with an ECA in the easternmost portion of the BSA (Spencer et al. 2010). However, this overlap is small

and no permanent impacts to wildlife movement corridors will result from project activities. The region is dominated by agricultural production and subject to frequent disturbance which would impede or deter dispersal and migratory movements. Additionally, the proposed alignment does not contain features, such as riparian vegetation, that are typically associated with wildlife movement corridors. Furthermore, project activities do not include the placement of fencing or any other barriers to wildlife. No significant wildlife movement corridors exist within the project area or surrounding 100-foot buffer and proposed project activities would not significantly impede wildlife movement. Therefore, there would be no impacts to wildlife movement due to project activities and no additional measures are recommended.

5.5 Habitat Conservation Plans

The proposed project would have a significant effect on biological resources if it would:

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

The northern part of the project area lies within the MBHCP. This project does not require a discretionary development permit, however, and project activities do not constitute covered activities under the MBHCP. Therefore, the proposed project would not conflict with any Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or State habitat conservation plan and no further measures are recommended.

6 Limitations, Assumptions, and Use Reliance

This BRA has been performed in accordance with professionally accepted biological investigation practices conducted at this time and in this geographic area. The biological investigation is limited by the scope of work performed. Reconnaissance biological surveys for certain taxa may have been conducted as part of this assessment but were not performed during a particular blooming period, nesting period, or particular portion of the season when positive identification would be expected if present, and therefore, cannot be considered definitive. The biological surveys are limited also by the environmental conditions present at the time of the surveys. In addition, general biological (or protocol) surveys do not guarantee that the organisms are not present and will not be discovered in the future within the site. In particular, mobile wildlife species could occupy the site on a transient basis, or re-establish populations in the future. Our field studies were based on current industry practices, which change over time and may not be applicable in the future. No other guarantees or warranties, expressed or implied, are provided. The findings and opinions conveyed in this report are based on findings derived from site reconnaissance, jurisdictional areas, review of CNDDDB RareFind5, and specified historical and literature sources. Standard data sources relied upon during the completion of this report, such as the CNDDDB, may vary with regard to accuracy and completeness. In particular, the CNDDDB is compiled from research and observations reported to CDFW that may or may not have been the result of comprehensive or site-specific field surveys. Although Rincon believes the data sources are reasonably reliable, Rincon cannot and does not guarantee the authenticity or reliability of the data sources it has used. Additionally, pursuant to our contract, the data sources reviewed included only those that are practically reviewable without the need for extraordinary research and analysis.

7 References

- American Ornithologists' Union (AOU). 2010. Check-list of North American Birds. Retrieved from: <http://www.americanornithology.org/content/checklist-north-and-middle-american-birds>
- Baldwin, B.G. (Ed.), D.H. Goldman (Ed.), D. J. Keil (Ed.), R. Patterson (Ed.), T. J. Rosatti (Ed.), D. H. Wilken (Ed.). 2012. The Jepson Manual: Vascular Plants of California, Second Edition, Thoroughly Revised and Expanded. University of California Press. Berkeley, California.
- Bowers, N., R. Bowers, & K. Kaufman. 2004. Mammals of North America.
- Burt, W.H., and R.P. Grossenheider. 1980. A Field Guide to the Mammals of North American North of Mexico. The Peterson Field Guide Series.
- Calflora. 2020. Information on wild California plants for conservation, education, and appreciation. Berkeley, CA. Updated online and accessed via: www.calflora.org. Accessed November 2020.
- California Burrowing Owl Consortium. 1993. Burrowing Owl Survey Protocol and Mitigation Guidelines. Available at: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=83842&inl>.
- California Department of Fish and Wildlife (CDFW). 2012. Staff Report on Burrowing Owl Mitigation. Available at: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=83843&inline>.
- _____. 2020a. California Natural Diversity Database, Rarefind V. Accessed July 2020.
- _____. 2020b. Biogeographic Information and Observation System (BIOS). Updated online and accessed via: www.wildlife.ca.gov/data/BIOS. Accessed November 2020.
- _____. 2020c. Special Animals List. Biogeographic Data Branch, California Natural Diversity Database. July 2020.
- _____. 2020d. Special Vascular Plants, Bryophytes, and Lichens List. Biogeographic Data Branch, California Natural Diversity Database. September 2020.
- _____. 2020e. California Sensitive Natural Communities List. Biogeographic Data Branch, California Natural Diversity Database. September 2020.
- California Department of Water Resources (CDWR). 2020. California Department of Water Resources Water Management Planning Tool. Located at: <https://gis.water.ca.gov/app/boundaries/>. Accessed July 2020.
- California Native Plant Society (CNPS). 2020. Online Inventory of Rare and Endangered Plants. Accessed at: www.rareplants.cnps.org. Accessed July 2020.
- California State University, Stanislaus (CSU Stanislaus). 2020. Department of Biological Sciences. Endangered Species Recovery Program website. Updated online and accessed at: <https://esrp.csustan.edu>. Accessed November 2020.
- Cornell Lab of Ornithology. 2020. All About Birds online guide. Accessed at: allaboutbirds.org. Accessed October 2020.
- Holland, Robert F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. California Department of Fish and Wildlife, Nongame Heritage Program. 156 pgs.

- Nafis, G. 2020. California Herps - A Guide to the Amphibians and Reptiles of California. Updated online and accessed via: <http://www.californiaherps.com>. Accessed November 2020.
- National Oceanic and Atmospheric Administration (NOAA). 2020. National Weather Service. Bakersfield Climate. Available at: <https://www.weather.gov/hnx/bflmain>.
- Saurez, A.V., J.Q. Richmond, and T.J. Case. 2000. Prey selection in horned lizards following the invasion of Argentine ants in Southern California. *Ecological Applications*. 10 (3): 711-725.
- Sawyer, J. O., T. Keeler-Wolf, and J.M. Evens. 2009. A Manual of California Vegetation, Second Edition. California Native Plant Society, Sacramento, California.
- Spencer, W.D., P. Beier, K. Penrod, K. Winters, C. Paulman, H. Rustigian- Romsos, J. Strittholt, M. Parisi, and A. Pettler. 2010. California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California. Prepared for California Department of Transportation, California Department of Fish and Game, and Federal Highways Administration. Available at: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18366>. Accessed July 2020.
- Stebbins, R. C. 2003. A Field Guide to Western Reptiles and Amphibians. 2nd ed. Houghton-Mifflin Company. Boston, Massachusetts.
- United States Department of Agricultural, Natural Resources Conservation Service (USDA NRCS). 2020a. Web Soil Survey. Updated online and accessed via: <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>. Accessed November 2020.
- _____. 2020b. Lists of Hydric Soils. National Cooperative Soil Survey, U.S. Department of Agriculture. Updated online and accessed via: <https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/>.
- United States Environmental Protection Agency (US EPA). 2007. Tulare Lake Basin Hydrology and Hydrography: A Summary of the Movement of Water and Aquatic Species. Prepared by ECORP Consulting, Inc. Available at: <https://www.epa.gov/sites/production/files/2018-05/documents/tulare-fullreport.pdf>.
- _____. 2020a. How's My Waterway online portal. Available at: <https://mywaterway.epa.gov/community>. Accessed November 2020.
- _____. 2020b. Endangered Species Facts: San Joaquin Kit Fox. Available at: <https://www.epa.gov/sites/production/files/2013-08/documents/san-joaquin-kitfox.pdf>. Accessed November 2020.
- United States Fish and Wildlife Service (USFWS). 1973. The Endangered Species Act of 1973, as amended (16 U.S.C 1531 et seq.).
- _____. 2000. Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants.
- _____. 2020a. Critical Habitat Portal. Available at: <https://ecos.fws.gov/ecp/report/table/critical-habitat.html>
- _____. 2020b. Information for Planning and Consultation (iPaC) online project planning tool. Available at: <https://ecos.fws.gov/ipac/>
- _____. 2020c. National Wetlands Inventory (NWI) online Wetlands Mapper. Available at: <https://www.fws.gov/wetlands/data/mapper.html>. Accessed July 2020.

_____.2011. Standardized Recommendations for the Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance. Available at:
https://www.fws.gov/sacramento/es/survey-protocols-guidelines/Documents/kitfox_standard_rec_2011.pdf

United States Geologic Survey (USGS). 2020. National Hydrography Dataset (NHD). Available at:
<https://www.usgs.gov/core-science-systems/ngp/national-hydrography>. Accessed July 2020.

Zeiner, D., W.F. Laudenslayer, Jr., and K.E. Mayer. May 1988. California's Wildlife. California Statewide Wildlife Habitat Relationship System, Volumes I, II, & III. California Department of Fish and Wildlife.

8 List of Preparers

Rincon Consultants, Inc.

Primary Author

- Brooke Fletcher, Biologist and Project Manager

Secondary Author

- Heather Price Curran, Associate Biologist

Senior Review

- Craig Lawrence, Senior Biologist

Principal Review

- Sherri Miller, Principal

Graphics

- Erik Holtz, GIS Analyst

Field Reconnaissance Survey

- Brooke Fletcher, Biologist and Project Manager

Production

- Dario Campos, Formatting Specialist

This page intentionally left blank.

Appendix A

Regulatory Setting

Regulatory Setting

Special-status habitats are vegetation types, associations, or sub-associations that support concentrations of special-status plant or animal species, are of relatively limited distribution, or are of particular value to wildlife.

Listed species are those taxa that are formally listed as endangered or threatened by the federal government (e.g. U.S. Fish and Wildlife Service [USFWS]), pursuant to the Federal Endangered Species Act (FESA) or as endangered, threatened, or rare (for plants only) by the State of California (i.e. California Fish and Game Commission), pursuant to the California Endangered Species Act (CESA) or the California Native Plant Protection Act. Some species are considered rare (but not formally listed) by resource agencies, organizations with biological interests/expertise (e.g. Audubon Society, CNPS, The Wildlife Society), and the scientific community.

The following is a brief summary of the regulatory context under which biological resources are managed at the federal, state, and local levels. A number of federal and state statutes provide a regulatory structure that guides the protection of biological resources. Agencies with the responsibility for protection of biological resources within the project site include:

- U.S. Army Corps of Engineers (wetlands and other waters of the United States);
- Central Valley Regional Water Quality Control Board (waters of the State);
- U.S. Fish and Wildlife Service (federally listed species and migratory birds);
- California Department Fish and Wildlife (riparian areas, streambeds, and lakes; state-listed species; Species of Special Concern; Fully Protected species; Watch List species; nesting birds);
- Kern County
- The City of Arvin
- Metropolitan Bakersfield

National Environmental Policy Act

NEPA provides an interdisciplinary framework for environmental planning by federal agencies and contains action-forcing procedures to ensure that federal agency decision makers take environmental factors into account. NEPA applies whenever a federal agency proposes an action, grants a permit, or agrees to fund or otherwise authorize any other entity to undertake an action that could possibly affect environmental resources. Caltrans is the designated NEPA lead agency for this project, acting under delegation from FHWA.

U.S. Army Corps of Engineers

Under Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers (USACE) has authority to regulate activities that could discharge fill of material into wetlands or other “waters of the United States.” Perennial and intermittent creeks are considered waters of the United States if they are hydrologically connected to other jurisdictional waters (typically a navigable water). The USACE also implements the federal policy embodied in Executive Order 11990, which is intended to result in no net loss of wetland value or acres. In achieving the goals of the Clean Water Act, the USACE seeks to avoid adverse impacts and offset unavoidable adverse impacts on existing aquatic resources. Any fill of wetlands that are hydrologically connected to jurisdictional waters would require a permit from the USACE prior to the start of work. Typically, when a project involves

impacts to waters of the United States, the goal of no net loss of wetland acres or values is met through avoidance and minimization to the extent practicable, followed by compensatory mitigation involving creation or enhancement of similar habitats.

Regional Water Quality Control Board Jurisdiction

The State Water Resources Control Board (SWRCB) and the local Regional Water Quality Control Board (RWQCB) have jurisdiction over “waters of the State,” pursuant to the Porter-Cologne Water Quality Control Act, which are defined as any surface water or groundwater, including saline waters, within the boundaries of the State. The SWRCB has issued general Waste Discharge Requirements (WDRs) regarding discharges to “isolated” waters of the State (Water Quality Order No. 2004-0004-DWQ, Statewide General Waste Discharge Requirements for Dredged or Fill Discharges to Waters Deemed by the U.S. Army Corps of Engineers to be Outside of Federal Jurisdiction). The RWQCB administers actions under this general order for isolated waters not subject to federal jurisdiction, and is also responsible for the issuance of water quality certifications pursuant to Section 401 of the Clean Water Act for waters subject to federal jurisdiction.

United States Fish and Wildlife Service

The USFWS implements the Migratory Bird Treaty Act (16 United States Code [USC] Section 703-711) and the Bald and Golden Eagle Protection Act (16 USC Section 668). The USFWS and National Marine Fisheries Service (NMFS) share responsibility for implementing the Federal Endangered Species Act (FESA) (16 USC § 153 et seq.). Generally, the USFWS implements the FESA for terrestrial and freshwater species, while the NMFS implements the FESA for marine and anadromous species. Projects that would result in “take” of any federally threatened or endangered species are required to obtain permits from the USFWS or NMFS through either Section 7 (interagency consultation with a federal nexus) or Section 10 (Habitat Conservation Plan) of the FESA, depending on the involvement by the federal government in permitting and/or funding of the project. The permitting process is used to determine if a project would jeopardize the continued existence of a listed species and what measures would be required to avoid jeopardizing the species. “Take” under federal definition means to harass, harm (which includes habitat modification), pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Proposed or candidate species do not have the full protection of the FESA; however, the USFWS and NMFS advise project applicants that they could be elevated to listed status at any time.

California Department of Fish and Wildlife

The California Department of Fish and Wildlife (CDFW) derives its authority from the Fish and Game Code of California. The California Endangered Species Act (CESA) (Fish and Game Code Section 2050 et. seq.) prohibits take of state listed threatened or endangered. Take under CESA is restricted to direct mortality of a listed species and the law does not prohibit indirect harm by way of habitat modification. Where incidental take would occur during construction or other lawful activities, CESA allows the CDFW to issue an Incidental Take Permit upon finding, among other requirements, that impacts to the species have been minimized and fully mitigated.

The CDFW also enforces Sections 3511, 4700, 5050, and 5515 of the Fish and Game Code, which prohibits take of species designated as Fully Protected. The CDFW is not allowed to issue an Incidental Take Permit for Fully Protected species; therefore, impacts to these species must be avoided.

California Fish and Game Code sections 3503, 3503.5, and 3513 describe unlawful take, possession, or destruction of native birds, nests, and eggs. Section 3503.5 of the Code protects all birds-of-prey and their eggs and nests against take, possession, or destruction of nests or eggs. Section 3513 makes it a state-level offense to take any bird in violation of the federal Migratory Bird Treaty Act. CDFW administers these requirements.

Species of Special Concern (SSC) is a category used by the CDFW for those species which are considered to be indicators of regional habitat changes or are considered to be potential future protected species. Species of Special Concern do not have any special legal status except that which may be afforded by the Fish and Game Code as noted above. The SSC category is intended by the CDFW for use as a management tool to include these species in special consideration when decisions are made concerning the development of natural lands. The CDFW also has authority to administer the Native Plant Protection Act (NPPA) (Fish and Game Code Section 1900 et seq.). The NPPA requires the CDFW to establish criteria for determining if a species, subspecies, or variety of native plant is endangered or rare. Effective in 2015, CDFW promulgated regulations (14 CCR 786.9) under the authority of the NPPA, establishing that the CESA's permitting procedures would be applied to plants listed under the NPPA as "Rare." With this change, there is little practical difference for the regulated public between plants listed under CESA and those listed under the NPPA.

Perennial, intermittent, and ephemeral streams and associated riparian vegetation, when present, also fall under the jurisdiction of the CDFW. Section 1600 *et seq.* of the Fish and Game Code (Lake and Streambed Alteration Agreements) gives the CDFW regulatory authority over activities that divert, obstruct, or alter the channel, bed, or bank of any river, stream or lake.

Local Jurisdiction

Kern County General Plan

The Kern County General Plan (GP) includes the "Land Use, Open Space, and Conservation Element" which aims to assure "the conservation of Kern County's agricultural, natural, and resource attributes." This is supported by Policy 28 of 1.10.15 Threatened and Endangered Species which states that the "County will work closely with State and federal agencies to assure that discretionary projects avoid or minimize impacts to fish, wildlife, and botanical resources." Additionally, Policy 32 states that "riparian areas will be managed in accordance with United States Army Corps of Engineers, and the California Department of Fish and Game rules and regulations to enhance the drainage, flood control, biological, recreational, and other beneficial uses with acknowledging existing land use patterns." Policy 65 of 1.10.10 Oak Tree Conservation protects oak woodlands and large oak trees.

Kern County Municipal Code

The City of Kern County Municipal Code Chapter 19.73 (Kern River Corridor Combining District) prohibits the removal of live native trees with a trunk diameter greater than eight inches, measured at four feet above grade.

City of Arvin General Plan

The Conservation and Open Space Element of the City of Arvin General Plan (GP) includes policies for the preservation and management of biological and cultural resources. Goal 6 of the GP aims "to

preserve wildlife, endangered and/or rare species and natural habitats and ecosystems in the Arvin Planning area.” This includes the following policies:

Policy CO-6.1 Protect sensitive and significant ecological areas of unique vegetation and wildlife.

Policy CO-6.2 Protect from extinction the identified endangered species which recognize the Arvin area as part of their natural range.

Policy CO-6.3 Consider the establishment of protected open space areas, planted with native valley vegetation, to serve as wildlife habitat and natural laboratory for public education purposes.

Policy CO-6.4 Implement a relocation program for any rare and/or endangered animal species found in urbanized areas.

City of Arvin Municipal Code

The City of Arvin Municipal Code Chapter 12.12 Street Trees protects existing trees during project construction. The ordinance requires a permit from the city before cutting, trimming, pruning or removing any street trees. Furthermore, the replacement of removed trees is required by the city. Chapter 12.12.090 of the Municipal Code states that at least twelve square feet of open ground must be maintained around a street tree unless the director specifically permits otherwise.

Metropolitan Bakersfield Habitat Conservation Plan (MBHCP)

The Metropolitan Bakersfield Habitat Conservation Plan (MBHCP) Chapter 5 Conservation/Biological Resources contains policies addressing the protection of sensitive biological resources. This includes Policy 1 which aims to “direct development away from ‘sensitive biological resource’ areas, unless effective mitigation measures can be implemented.” Policy 2 preserves areas of riparian vegetation and wildlife habitat within floodways along rivers and streams. Policy 5 aims to “determine the locations and extent of suitable habitat areas required for the effective conservation management of designated ‘sensitive’ plant and animal species.” The MBHCP includes programs to implement the goals and policies of the Conservation Element affecting biological resources. This includes consulting available biological resource data covering the area and determining the potential impacts and necessary mitigation measures, as required in the California Environmental Quality Act. This also includes preserving habitat and avoiding “take” of protected species as required in the MBHCP.

Appendix B

Site Photographs



Photo 1. View across Muller Road of the northernmost portion of the proposed pipeline alignment. The alignment follows a compacted dirt access road within citrus orchards in this portion of the BSA.



Photo 2. View of the proposed pipeline alignment south of Muller Road. The alignment follows a compacted dirt access road between citrus orchards and sorghum fields in this portion of the BSA.

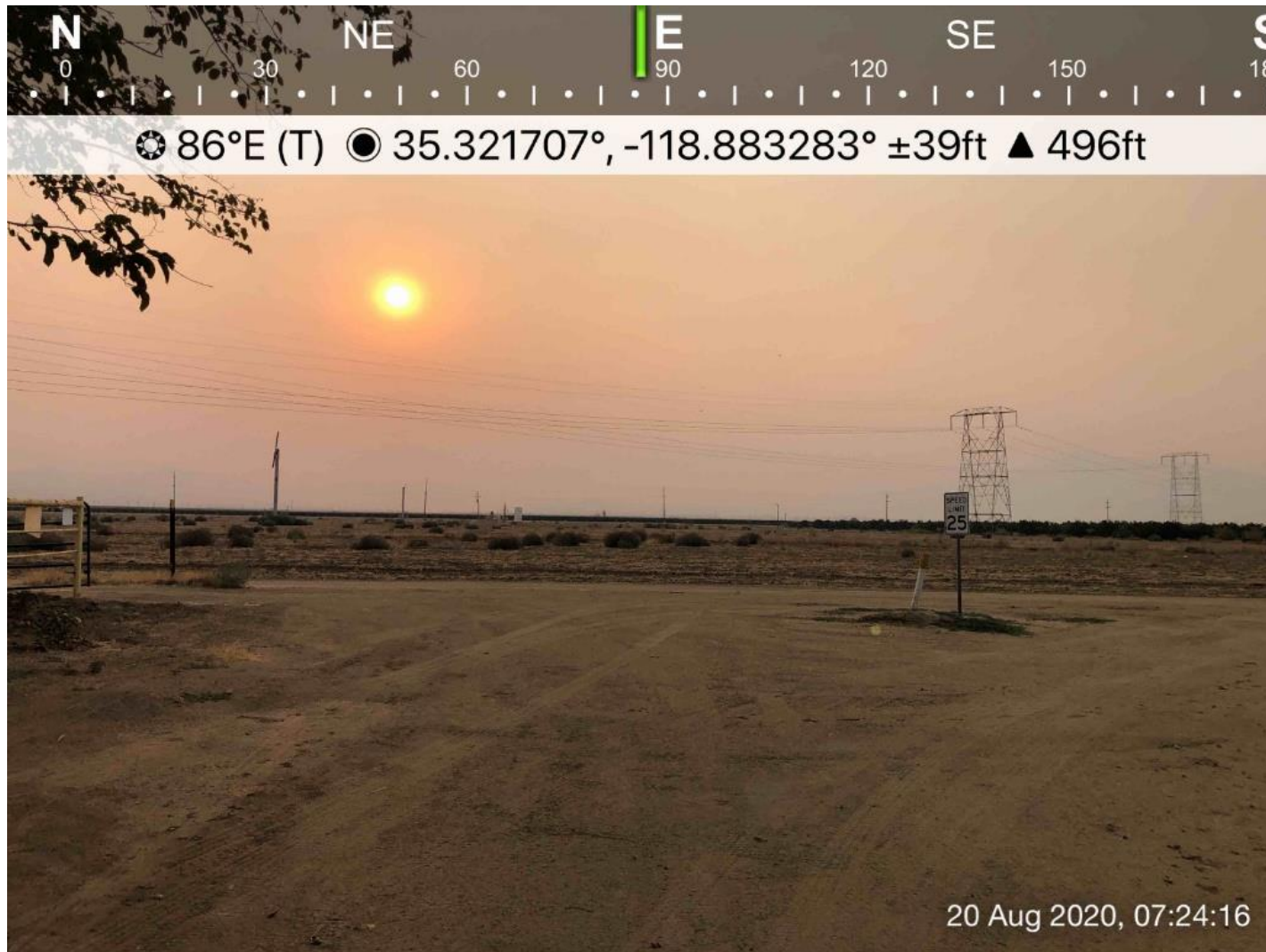


Photo 3. View of a fallow field with non-native grassland adjacent to the proposed pipeline alignment, near the northeastern boundary of the BSA. Transmission towers within and around the BSA could provide suitable nesting habitat for some avian species.



Photo 4. View of the proposed pipeline alignment in the northeastern portion of the BSA. Ruderal areas between cultivated orchards and fields could provide suitable habitat for some special-status species.

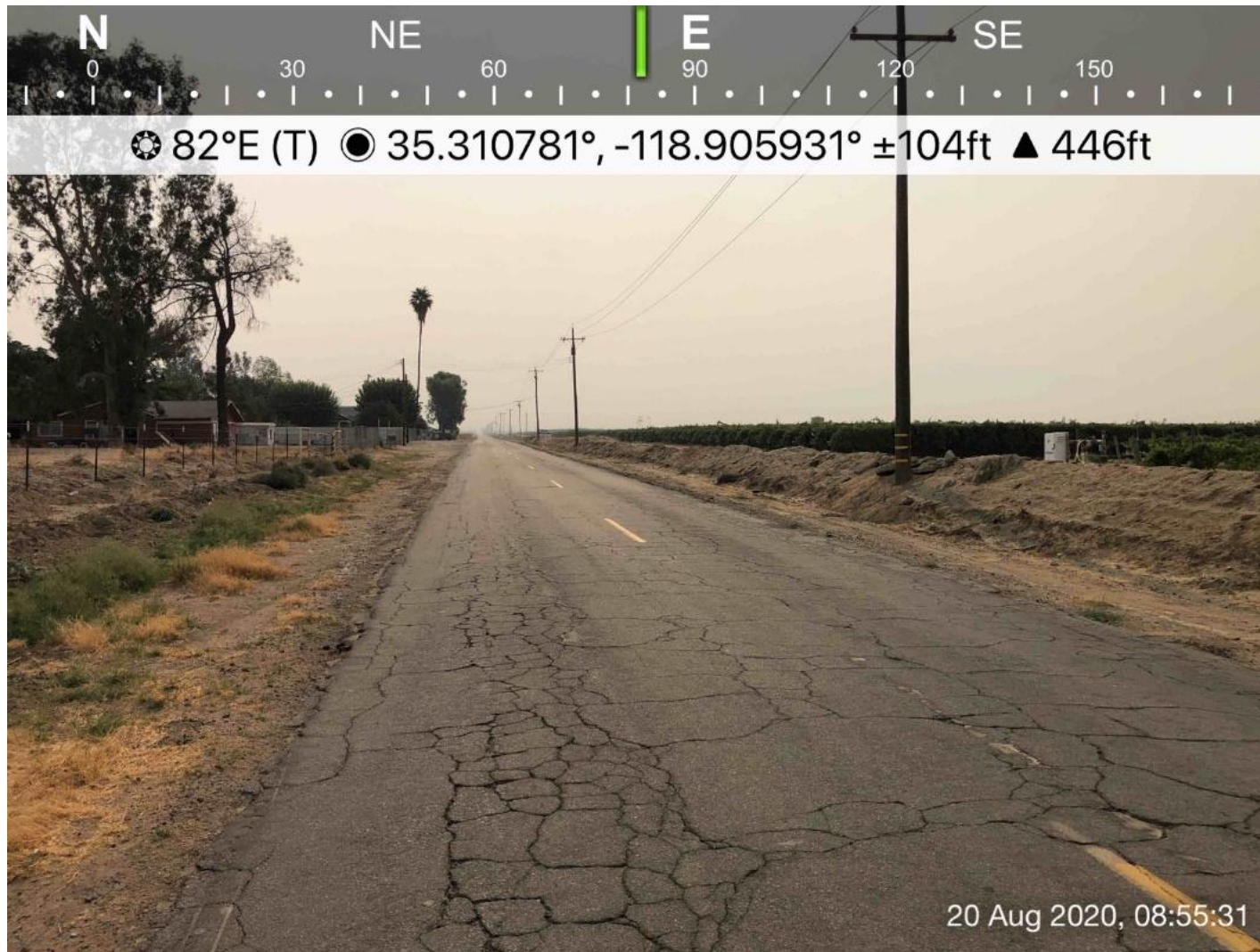


Photo 5. View from the westernmost point of the pipeline alignment on Hermosa Road. Many burrows are present within the right-of-way on either side of the road.

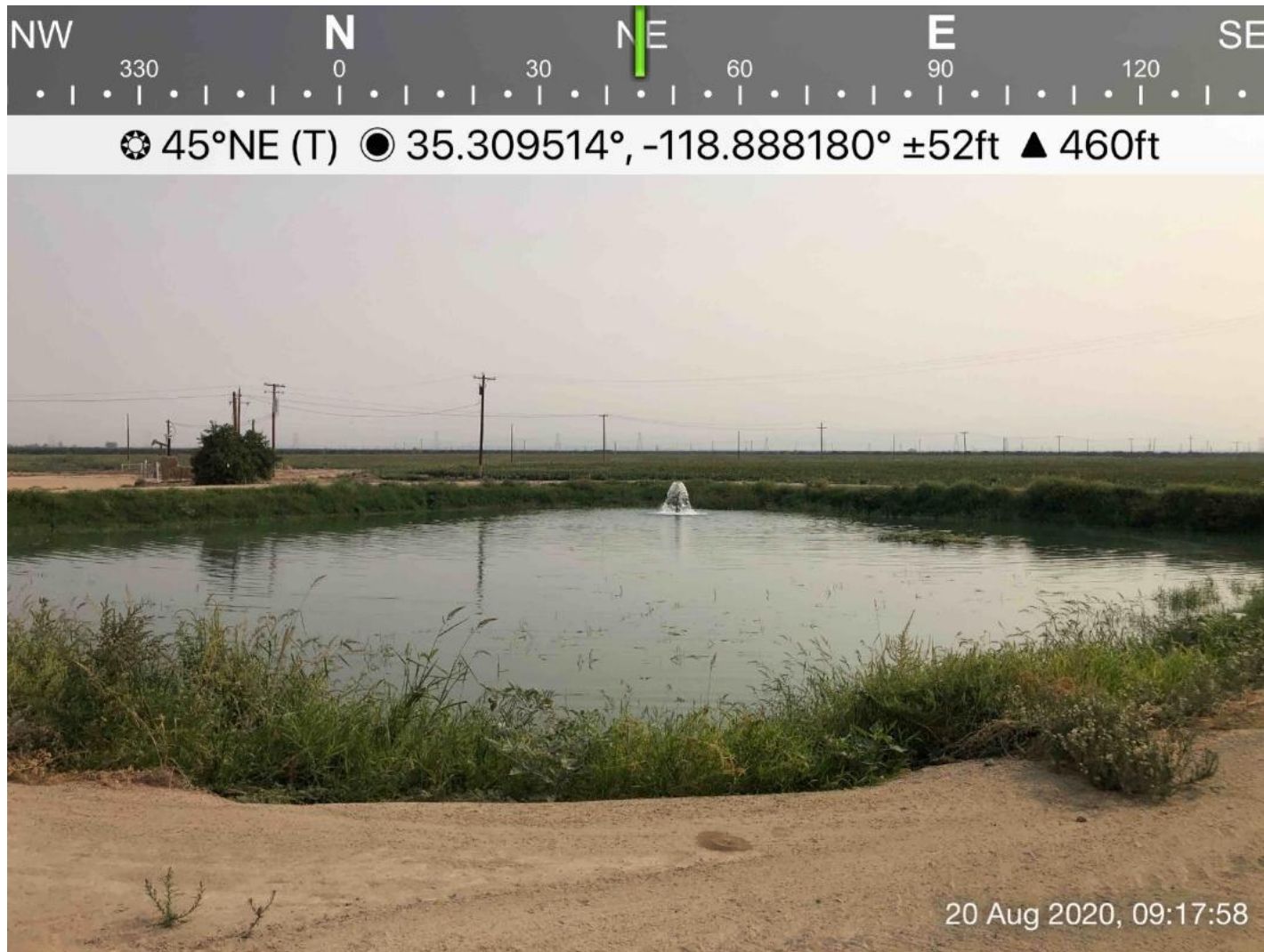


Photo 6. View of an agricultural pond located just west of the proposed pipeline alignment, south of Hermosa Road.



Photo 7. View across Malaga Road of cultivated agricultural fields adjacent to the BSA.



Photo 8. View of an agricultural basin just east of the proposed pipeline alignment along Edison Road, south of Di Giorgio Road and north of Buena Vista Boulevard.

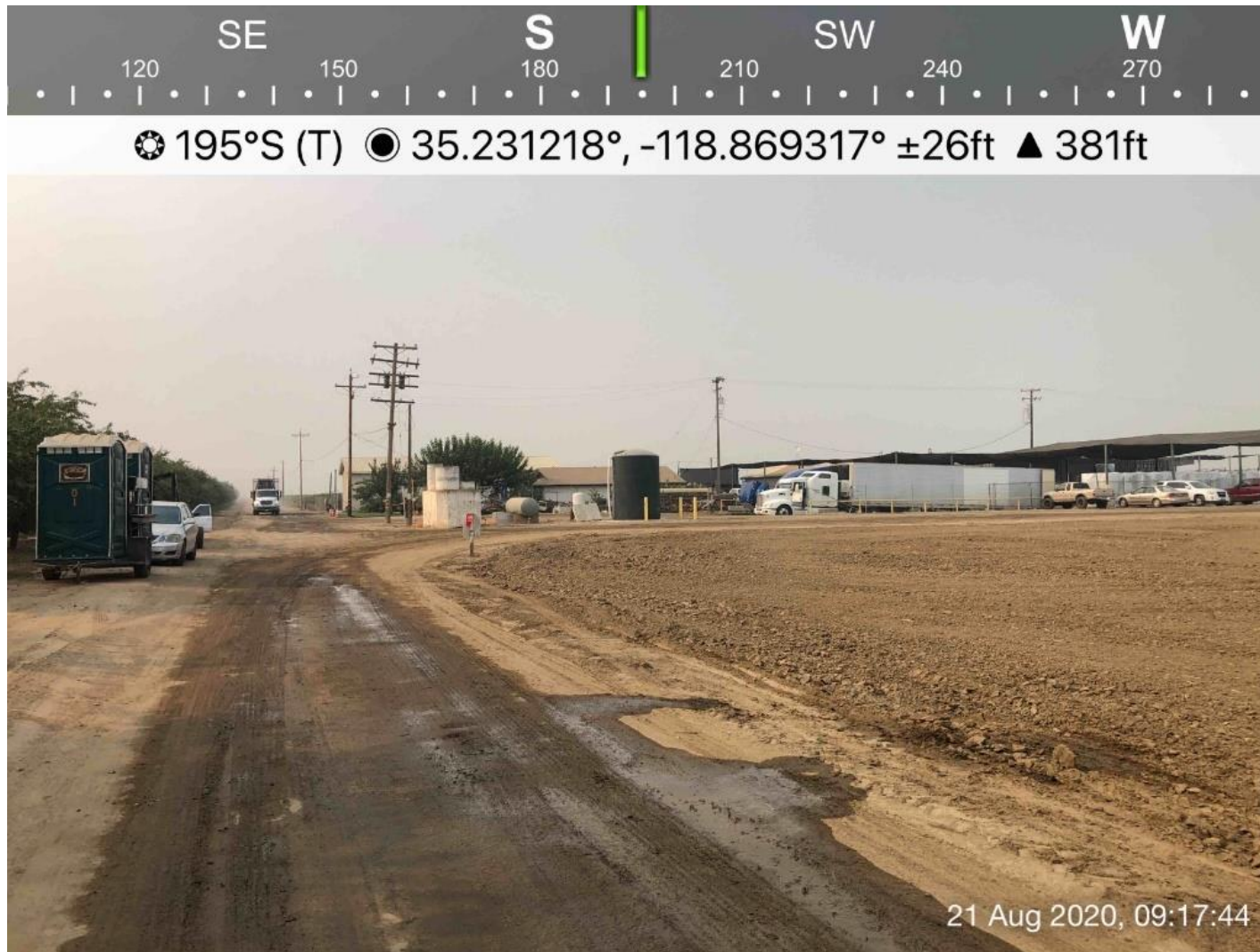


Photo 9. View of the proposed pipeline alignment at the junction of Duncan Street and Russell Avenue. An agricultural production facility is located just south of the alignment.



Photo 10. View of the proposed pipeline alignment along Teale Road, near the southwest corner of the BSA. Invasive tamarisk trees are growing in the adjacent agricultural canal associated with Tejon Creek.

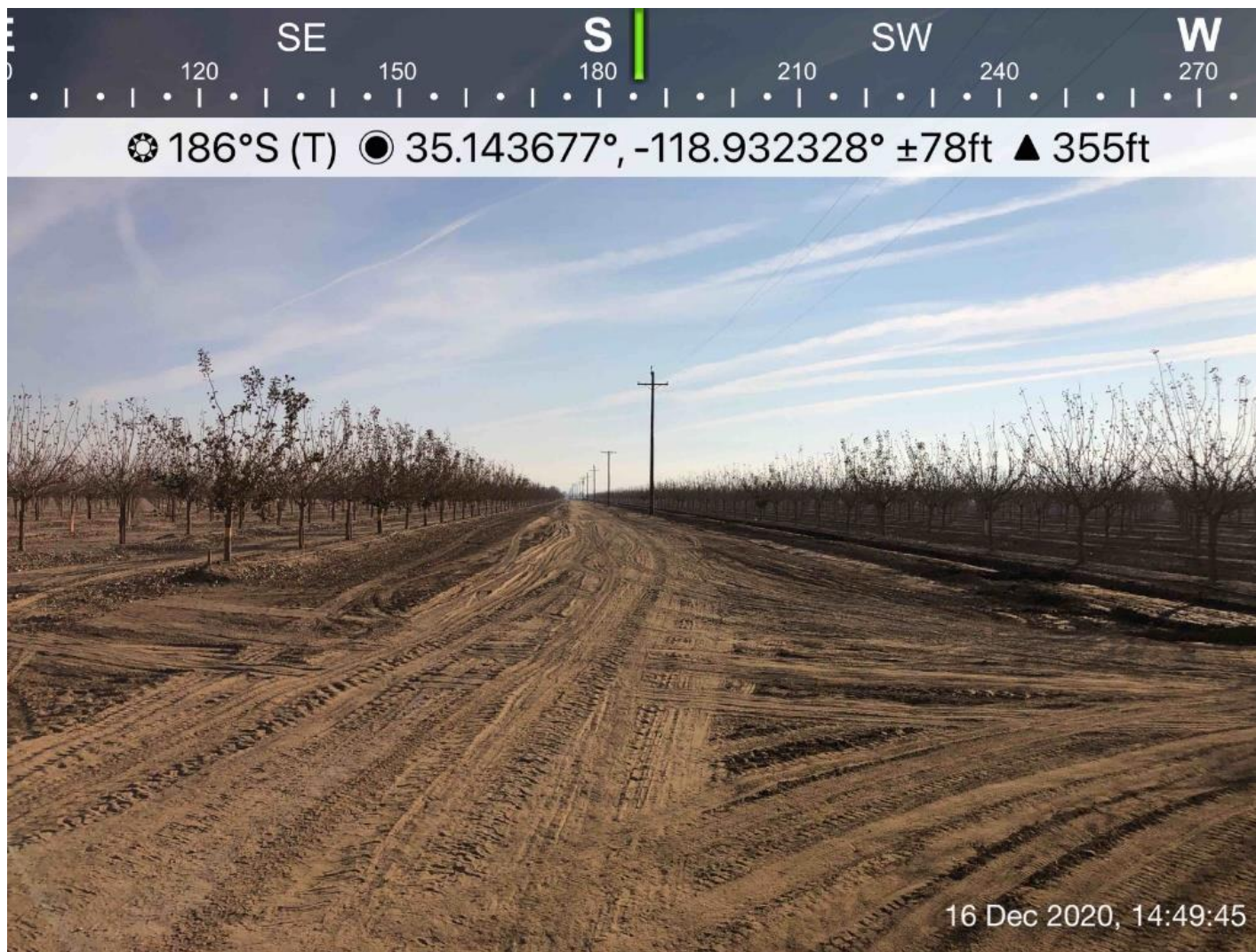


Photo 11. View of the proposed alignment along a compacted dirt road between two deciduous orchards.



Photo 12. Representative view of a ground squirrel burrow along the proposed alignment.

Appendix C

Floral and Faunal Compendium

Plant Species Observed Within the Biological Study Area during Field Reconnaissance Surveys on October 20, 21, 25, and 27, and December 16, 2020

Scientific Name	Common Name	Status	Native or Introduced
Plants			
Herbs			
<i>Amaranthus albus</i>	pigweed amaranth	None	Introduced
<i>Ambrosia acanthicarpa</i>	annual bursage	None	Native
<i>Amsinckia intermedia</i>	common fiddleneck	None	Native
<i>Brassica nigra</i>	black mustard	None	Introduced, Cal-IPC ¹ : Moderate
<i>Brassica rapa</i>	common mustard	None	Introduced, Cal-IPC: Limited
<i>Datura wrightii</i>	Jimsonweed	None	Native
<i>Erigeron bonariensis</i>	horseweed	None	Introduced
<i>Heterotheca grandiflora</i>	telegraph weed	None	Native
<i>Hirschfeldia incana</i>	Mediterranean hoary mustard	None	Introduced, Cal-IPC: Moderate
<i>Lactuca serriola</i>	prickly lettuce	None	Introduced
<i>Portulaca oleracea</i>	common purslane	None	Introduced
<i>Salsola tragus</i>	Russian thistle	None	Introduced, Cal-IPC: Limited
<i>Solanum elaeagnifolium</i>	horse nettle	None	Introduced
<i>Tribulus terrestris</i>	puncture vine	None	Introduced, Cal-IPC: Limited
Grasses			
<i>Avena fatua</i>	wild oats	None	Introduced, Cal-IPC: Moderate
<i>Bromus diandrus</i>	ripgut brome	None	Introduced, Cal-IPC: Moderate
<i>Bromus madritensis</i>	foxtail chess	None	Introduced
<i>Bromus rubens</i>	red brome	None	Introduced, Cal-IPC: High
<i>Cynodon dactylon</i>	Bermuda grass	None	Introduced, Cal-IPC: Moderate
<i>Digitaria sanguinalis</i>	crabgrass	None	Introduced
<i>Medicago sativa</i>	alfalfa	None	Introduced, Cultivated
<i>Schismus arabicus</i>	Arabian schismus	None	Introduced, Cal-IPC: Limited
<i>Sorghum halepense</i>	Johnson grass	None	Introduced
<i>Sorghum spp.</i>	sorghum	None	Introduced, Cultivated
<i>Zea mays</i>	corn	None	Introduced, Cultivated
Trees			
<i>Citrus spp.</i>	orange	None	Introduced, Cultivated
<i>Eucalyptus camaldulensis</i>	red gum eucalyptus	None	Introduced, Cal-IPC: Limited
<i>Eucalyptus globulus</i>	blue gum eucalyptus	None	Introduced, Cal-IPC: Limited
<i>Olea europaea</i>	olive	None	Introduced, Cultivated, Cal-IPC: Limited
<i>Populus fremontii</i>	Fremont cottonwood	None	Native
<i>Prunus dulcis</i>	almond	None	Introduced, Cultivated
<i>Punica granatum</i>	pomegranate	None	Introduced, Cultivated

Scientific Name	Common Name	Status	Native or Introduced
Shrubs			
<i>Atriplex polycarpa</i>	Cattle saltbush	None	Native
<i>Nicotiana glauca</i>	tree tobacco	None	Introduced, Cal-IPC: Moderate
<i>Opuntia ficus-indica</i>	mission prickly pear	None	Introduced
<i>Salix exigua</i>	narrowleaf willow	None	Native
<i>Salix exigua</i> var. <i>hindsiana</i>	sandbar willow	None	Native
<i>Tamarix chinensis</i>	salt cedar	None	Introduced, Cal-IPC: High
<i>Vitis vinifera</i>	grape	None	Introduced, Cultivated

1. California Invasive Plant Council Rating, Source: CalFlora 2020

Animal Species Observed Within the Biological Study Area during Field Reconnaissance Surveys on October 20, 21, 25, and 27, and December 16, 2020

Scientific Name	Common Name	Status	Native or Introduced
Birds			
<i>Accipiter cooperii</i>	Cooper's hawk	CDFW: WL	Native
<i>Anas platyrhynchos</i>	mallard	None	Native
<i>Aphelocoma californica</i>	California scrub-jay	None	Native
<i>Ardea alba</i>	great egret	None	Native
<i>Ardea herodias</i>	great blue heron	None	Native
<i>Bubo virginianus</i>	great horned owl	None	Native
<i>Buteo jamaicensis</i>	red-tailed hawk	None	Native
<i>Calypte anna</i>	Anna's hummingbird	None	Native
<i>Cathartes aura</i>	turkey vulture	None	Native
<i>Charadrius vociferus</i>	killdeer	None	Native
<i>Corvus brachyrhynchos</i>	American crow	None	Native
<i>Euphagus cyanocephalus</i>	Brewer's blackbird	None	Native
<i>Gallus gallus</i>	domestic chicken	None	Introduced
<i>Geococcyx californianus</i>	greater roadrunner	None	Native
<i>Haemorhous mexicanus</i>	house finch	None	Native
<i>Mimus polyglottos</i>	northern mockingbird	None	Native
<i>Pandion haliaetus</i>	osprey	None	Native
<i>Passer domesticus</i>	house sparrow	None	Introduced
<i>Petrochelidon pyrrhonota</i>	cliff swallow	None	Native
<i>Sayornis nigricans</i>	black phoebe	None	Native
<i>Sturnus vulgaris</i>	European starling	None	Introduced
<i>Troglodytes aedon</i>	house wren	None	Native
<i>Turdus migratorius</i>	American robin	None	Native
<i>Tyrannus verticalis</i>	western kingbird	None	Native
<i>Tyto alba</i>	barn owl	None	Native
<i>Zenaida macroura</i>	mourning dove	None	Native

Scientific Name	Common Name	Status	Native or Introduced
<i>Zonotrichia leucophrys</i>	white-crowned sparrow	None	Native
Mammals			
<i>Bos taurus</i>	cattle	None	Introduced
<i>Canis latrans</i>	coyote	None	Native
<i>Canis lupus familiaris</i>	domestic dog	None	Introduced
<i>Felis catus</i>	domestic cat	None	Introduced
<i>Lepus californicus</i>	black-tailed jackrabbit	None	Native
<i>Otospermophilus beecheyi</i>	California ground squirrel	None	Native
<i>Procyon lotor</i>	raccoon	None	Native
<i>Sylvilagus audubonii</i>	desert cottontail	None	Native
<i>Thomomys bottae</i>	Botta's pocket gopher	None	Native
Reptiles			
<i>Plestiodon gilberti</i>	Gilbert's skink	None	Native
<i>Sceloporus occidentalis biseriatus</i>	San Joaquin fence lizard	None	Native
<i>Uta stansburiana</i>	side-blotched lizard	None	Native
Amphibians			
<i>Anaxyrus boreas halophilus</i>	California toad	None	Native
<i>Lithobates catesbeianus</i>	American bullfrog	None	Introduced
Insects			
<i>Dasymutilla spp.</i>	velvet ant	None	Native
<i>Pepsis formosa</i>	tarantula hawk	None	Native
Fish			
<i>Gambusia affinis</i>	mosquito fish	None	Native
WL= CDFW Watch List			

This page intentionally left blank.

Appendix D

Special-status Species Evaluation Tables

Special-status Plant Species in the Regional Vicinity of the Project Site

Scientific Name Common Name	Status Fed/State ESA CRPR	Habitat Requirements	Potential to Occur	Rationale
<i>Astragalus hornii</i> var. <i>hornii</i> Horn's milk-vetch	None/None G4G5T1T2/S1 1B.1BLM_S- Sensitive	Meadows and seeps, Playas. lake margins, alkaline. 60 - 850 m. annual herb. Blooms May-Oct	Not Expected	There are 2 known CNDDB occurrences within 5 miles, one which was in the site north of Arvin. However, the occurrences are historical (1936, 1962) and suitable habitat is not present.
<i>Atriplex cordulata</i> var. <i>cordulata</i> heartscale	None/None G3T2/S2 1B.2BLM_S- Sensitive	Chenopod scrub, Meadows and seeps, Valley and foothill grassland (sandy). saline or alkaline. 0 - 560 m. annual herb. Blooms Apr-Oct	Not Expected	There are no known CNDDB occurrences and suitable habitat is not present.
<i>Atriplex coronata</i> var. <i>vallicola</i> Lost Hills crownscale	None/None G4T2/S2 1B.2BLM_S- Sensitive SB_SBBG-Santa Barbara Botanic Garden	Chenopod scrub, Valley and foothill grassland, Vernal pools. alkaline. 50 - 635 m. annual herb. Blooms Apr-Sep	Not Expected	There are no known CNDDB occurrences within 5 miles and suitable vernal pool habitat is not present.
<i>Atriplex tularensis</i> Bakersfield smallscale	None/SCE GX/SX 1A	Chenopod scrub. 90 - 200 m. annual herb. Blooms Jun-Oct	Not Expected	Suitable habitat is not present and the species is assumed to be extirpated in California.
<i>Calochortus palmeri</i> var. <i>palmeri</i> Palmer's mariposa lily	None/None G3T2/S2 1B.2BLM_S- Sensitive SB_RSABG_Rancho Santa Ana Botanic Garden SB_SBBG-Santa Barbara Botanic Garden USFS_S-Sensitive	Chaparral, Lower montane coniferous forest, Meadows and seeps. mesic. 710 - 2390 m. perennial bulbiferous herb. Blooms Apr-Jul	Not Expected	There is one known CNDDB occurrence within 5 miles. However, this occurrence is located east of the site in the Tehachapi Mountains, and the site is out of the species elevation range.
<i>Calochortus striatus</i> alkali mariposa lily	None/None G3?/S2S3 1B.2BLM_S- Sensitive SB_ RSABG_Rancho Santa Ana Botanic Garden USFS_S-Sensitive	Chaparral, Chenopod scrub, Mojavean desert scrub, Meadows and seeps. alkaline, mesic. 70 - 1595 m. perennial bulbiferous herb. Blooms Apr-Jun	Not Expected	There is one known CNDDB occurrence within 5 miles. However, this occurrence is located east of the site in the Tehachapi Mountains.

Arvin-Edison Water Storage District (AEWSD) Groundwater Service Area (GWSA) Project

Scientific Name Common Name	Status Fed/State ESA CRPR	Habitat Requirements	Potential to Occur	Rationale
<i>Caulanthus californicus</i> California jewelflower	FE/SCE G1/S1 1B.1SB_ RSABG_Rancho Santa Ana Botanic Garden SB_SBBG-Santa Barbara Botanic Garden SB_UCBG-UC Botanical Garden at Berkeley	Chenopod scrub, Pinyon and juniper woodland, Valley and foothill grassland. sandy. 61 - 1000 m. annual herb. Blooms Feb-May	Not Expected	There are 2 known historical CNDDDB occurrences (1986) within 5 miles, one which was within the site near Arvin. However, suitable woodland habitat is not present.
<i>Caulanthus lemmonii</i> Lemmon's jewelflower	None/None G3/S3 1B.2 SB_SBBG- Santa Barbara Botanic Garden USFS_S-Sensitive	Pinyon and juniper woodland, Valley and foothill grassland. 80 - 1580 m. annual herb. Blooms Feb-May	Not Expected	There are no known CNDDDB occurrences within 5 miles and suitable woodland habitat is not present.
<i>Chloropyron molle</i> ssp. <i>hispidum</i> hispid bird's-beak	None/None G2T1/S1 1B.1BLM_S- Sensitive	Meadows and seeps, Playas, Valley and foothill grassland. alkaline. 1 - 155 m. annual herb (hemiparasitic). Blooms Jun-Sep	Not Expected	There is one CNDDDB occurrence within 5 miles, however the occurrence is from 1946 and suitable habitat is not present.
<i>Clarkia tembloriensis</i> ssp. <i>calientensis</i> Vasek's clarkia	None/None G3T1/S1 1B.1BLM_S- Sensitive SB_ RSABG_Rancho Santa Ana Botanic Garden	Valley and foothill grassland. 275 - 500 m. annual herb. Blooms Apr	Not Expected	There are no known CNDDDB occurrences within 5 miles and the site is out of the species elevation range.
<i>Delphinium recurvatum</i> recurved larkspur	None/None G2?/S2? 1B.2BLM_S- Sensitive SB_SBBG-Santa Barbara Botanic Garden	Chenopod scrub, Cismontane woodland, Valley and foothill grassland. alkaline. 3 - 790 m. perennial herb. Blooms Mar- Jun	Not Expected	There are no known CNDDDB occurrences within 5 miles and suitable habitat is not present.
<i>Diplacus pictus</i> calico monkeyflower	None/None G2/S2 1B.2BLM_S- Sensitive SB_RSABG_Rancho Santa Ana Botanic Garden	Broadleafed upland forest, Cismontane woodland. granitic, disturbed areas. 100 - 1430 m. annual herb. Blooms Mar-May	Not Expected	There is one historical CNDDDB occurrence (1978) within 5 miles. However, the occurrence is east of the site in the Tehachapi Mountains and suitable habitat is not present.

Scientific Name Common Name	Status Fed/State ESA CRPR	Habitat Requirements	Potential to Occur	Rationale
<i>Eremalche parryi</i> ssp. <i>kernensis</i> Kern mallow	FE/None G3G4T3/S3 1B.2SB_RSABG- Rancho Santa Ana Botanic Garden SB_SBBG-Santa Barbara Botanic Garden	Chenopod scrub, Pinyon and juniper woodland, Valley and foothill grassland. On dry, open sandy to clay soils; often at edge of balds. 70 - 1290 m. annual herb. Blooms Jan,Mar,Apr,May(Feb)	Not Expected	There are 8 known CNDDDB occurrences within 5 miles but suitable habitat is not present.
<i>Eriogonum callistum</i> Tehachapi buckwheat	None/None G1/S1 1B.1SB_RSABG- Rancho Santa Ana Botanic Garden	Chaparral. openings, rocky, limestone. 1400 - 1730 m. perennial herb. Blooms May- Jul	Not Expected	There are no known CNDDDB occurrences within 5 miles and the site is out of the species elevation range.
<i>Eryngium spinosepalum</i> spiny-sepaled button- celery	None/None G2/S2 1B.2	Valley and foothill grassland, Vernal pools. 80 - 975 m. annual / perennial herb. Blooms Apr-Jun	Not Expected	There are no known CNDDDB occurrences within 5 miles and suitable vernal pool habitat is not present.
<i>Eschscholzia lemmonii</i> ssp. <i>kernensis</i> Tejon poppy	None/None G5T2/S2 1B.1SB_RSABG- Rancho Santa Ana Botanic Garden SB_SBBG-Santa Barbara Botanic Garden SB_USDA-US Dept of Agriculture	Chenopod scrub, Valley and foothill grassland. 160 - 1000 m. annual herb. Blooms (Feb)Mar-May	Not Expected	There are 7 known CNDDDB occurrences within 5 miles. However, the occurrences are east of the site in the Tehachapi Mountains and no suitable habitat is present.
<i>Fritillaria brandegeei</i> Greenhorn fritillary	None/None G2G3/S2S3 1B.3USFS_S- Sensitive	Lower montane coniferous forest (granitic). 1330 - 2100 m. perennial bulbiferous herb. Blooms Apr-Jun	Not Expected	There are no known CNDDDB occurrences within 5 miles and the site is out the species elevation range.
<i>Fritillaria striata</i> striped adobe-lily	None/SCT G1/S1 1B.1BLM_S- Sensitive SB_RSABG-Rancho Santa Ana Botanic Garden SB_USDA-US Dept of Agriculture USFS_S-Sensitive	Cismontane woodland, Valley and foothill grassland. usually clay. 135 - 1455 m. perennial bulbiferous herb. Blooms Feb-Apr	Not Expected	There are no known CNDDDB occurrences within 5 miles and suitable woodland habitat is not present.
<i>Githopsis tenella</i> delicate bluecup	None/None G2/S2 1B.3	Chaparral, Cismontane woodland. mesic, serpentinite. 325 - 1900 m. annual herb. Blooms Apr-Jun	Not Expected	There are no known CNDDDB occurrences within 5 miles and the site is out of the species elevation range.

Arvin-Edison Water Storage District (AEWSD) Groundwater Service Area (GWSA) Project

Scientific Name Common Name	Status Fed/State ESA CRPR	Habitat Requirements	Potential to Occur	Rationale
<i>Heterotheca shevockii</i> Shevock's golden-aster	None/None G2/S2 1B.3BLM_S- Sensitive SB_RSABG-Rancho Santa Ana Botanic Garden USFS_S-Sensitive	Chaparral, Cismontane woodland. sandy. 230 - 900 m. perennial herb. Blooms Aug-Nov	Not Expected	There are no known CNDDDB occurrences within 5 miles and the site is out of the species elevation range.
<i>Imperata brevifolia</i> California satintail	None/None G4/S3 2B.1 SB_RSABG- Rancho Santa Ana Botanic Garden SB_SBBG-Santa Barbara Botanic Garden USFS_S-Sensitive	Chaparral, Coastal scrub, Mojavean desert scrub, Meadows and seeps (often alkali), Riparian scrub. mesic. 0 - 1215 m. perennial rhizomatous herb. Blooms Sep-May	Not Expected	There are no known CNDDDB occurrences within 5 miles and suitable habitat is not present.
<i>Lasthenia glabrata</i> ssp. <i>coulteri</i> Coulter's goldfields	None/None G4T2/S2 1B.1BLM_S- Sensitive SB_RSABG-Rancho Santa Ana Botanic Garden SB_SBBG-Santa Barbara Botanic Garden	Marshes and swamps (coastal salt), Playas, Vernal pools. 1 - 1220 m. annual herb. Blooms Feb-Jun	Not Expected	There are no known CNDDDB occurrences within 5 miles and suitable marsh and swamp habitat is not present.
<i>Layia heterotricha</i> pale-yellow layia	None/None G2/S2 1B.1BLM_S- Sensitive SB_SBBG-Santa Barbara Botanic Garden USFS_S-Sensitive	Cismontane woodland, Coastal scrub, Pinyon and juniper woodland, Valley and foothill grassland. alkaline or clay. 300 - 1705 m. annual herb. Blooms Mar-Jun	Not Expected	There are no known CNDDDB occurrences within 5 miles and the site is out of the species elevation range.
<i>Layia leucopappa</i> Comanche Point layia	None/None G1/S1 1B.1BLM_S- Sensitive SB_SBBG-Santa Barbara Botanic Garden	Chenopod scrub, Valley and foothill grassland. 100 - 350 m. annual herb. Blooms (Feb)Mar-Apr	Not Expected	There are 9 known CNDDDB occurrences within 5 miles, including 2 occurrences within the site near Arvin and at the northern portion of the site. However, these are historical occurrences (1935) and suitable habitat is not present.

Scientific Name Common Name	Status Fed/State ESA CRPR	Habitat Requirements	Potential to Occur	Rationale
<i>Layia munzii</i> Munz's tidy-tips	None/None G2/S2 1B.2BLM_S- Sensitive	Chenopod scrub, Valley and foothill grassland (alkaline clay). 150 - 700 m. annual herb. Blooms Mar-Apr	Not Expected	There is one historical CNDDDB occurrence within 5 miles, near the city of Arvin, but that was a historical occurrence (1935) and suitable habitat is not present.
<i>Leptosiphon serrulatus</i> Madera leptosiphon	None/None G3/S3 1B.2USFS_S- Sensitive	Cismontane woodland, Lower montane coniferous forest. 300 - 1300 m. annual herb. Blooms Apr-May	Not Expected	There are no known CNDDDB occurrences within 5 miles and the site is out of the species elevation range.
<i>Monardella linoides</i> ssp. <i>oblonga</i> Tehachapi monardella	None/None G5T2/S2 1B.3BLM_S- Sensitive SB_RSABG-Rancho Santa Ana Botanic Garden USFS_S-Sensitive	Lower montane coniferous forest, Pinyon and juniper woodland, Upper montane coniferous forest. 900 - 2470 m. perennial rhizomatous herb. Blooms (May)Jun-Aug	Not Expected	There are no known CNDDDB occurrences within 5 miles and the site is out of the species elevation range.
<i>Monolopia congdonii</i> San Joaquin woollythreads	FE/None G2/S2 1B.2SB_UCBG-UC Botanical Garden at Berkeley	Chenopod scrub, Valley and foothill grassland (sandy). 60 - 800 m. annual herb. Blooms (Jan)Feb-May	Not Expected	There are 3 known CNDDDB occurrences within 5 miles, including one occurrence within the site south of Arvin. However, this is a historical occurrence (1935) and no suitable habitat is present.
<i>Muhlenbergia utilis</i> aparejo grass	None/None G4/S2S3 2B.2	meadows and seeps, marshes and swamps, chaparral, coastal scrub, cismontane woodland. sometimes alkaline, sometimes serpentinite. 25 - 2325 m. perennial rhizomatous herb. Blooms Mar-Oct	Not Expected	There are no known CNDDDB occurrences within 5 miles and suitable habitat is not present.
<i>Navarretia setiloba</i> Piute Mountains navarretia	None/None G2/S2 1B.1BLM_S- Sensitive USFS_S-Sensitive	Cismontane woodland, Pinyon and juniper woodland, Valley and foothill grassland. clay or gravelly loam. 285 - 2100 m. annual herb. Blooms Apr-Jul	Not Expected	There are 6 known CNDDDB occurrences within 5 miles, however the site is out of the species elevation range.
<i>Opuntia basilaris</i> var. <i>treleasei</i> Bakersfield cactus	FE/SCE G5T1/S1 1B.1SB_RSABG-Rancho Santa Ana Botanic Garden	Chenopod scrub, Cismontane woodland, Valley and foothill grassland. sandy or gravelly. 100 - 1450 m. perennial stem succulent. Blooms Apr-May	Not Expected	There are 16 known CNDDDB occurrences within 5 miles but no suitable habitat is present.

Arvin-Edison Water Storage District (AEWSD) Groundwater Service Area (GWSA) Project

Scientific Name Common Name	Status Fed/State ESA CRPR	Habitat Requirements	Potential to Occur	Rationale
<i>Pseudobahia peirsonii</i> San Joaquin adobe sunburst	FT/SCE G1/S1 1B.1SB_RSABG- Rancho Santa Ana Botanic Garden	Cismontane woodland, Valley and foothill grassland. adobe clay. 90 - 800 m. annual herb. Blooms Feb-Apr	Not Expected	There are no known CNDDDB occurrences within 5 miles and suitable woodland habitat is not present.
<i>Puccinellia simplex</i> California alkali grass	None/None G3/S2 1B.2	Chenopod scrub, Meadows and seeps, Valley and foothill grassland, Vernal pools. Alkaline, vernal mesic; sinks, flats, and lake margins. 2 - 930 m. annual herb. Blooms Mar-May	Not Expected	There is 1 known CNDDDB occurrences within 5 miles, however suitable vernal pool habitat is not present.
<i>Stylocline citroleum</i> oil neststraw	None/None G3/S3 1B.1BLM_S- Sensitive	Chenopod scrub, Coastal scrub, Valley and foothill grassland. clay. 50 - 400 m. annual herb. Blooms Mar-Apr	Not Expected	There is 1 historical CNDDDB occurrence (1935) within 5 miles, however suitable coastal scrub habitat is not present.
<i>Stylocline masonii</i> Mason's neststraw	None/None G1/S1 1B.1BLM_S- Sensitive USFS_S-Sensitive	Chenopod scrub, Pinyon and juniper woodland. sandy. 100 - 1200 m. annual herb. Blooms Mar-May	Not Expected	Suitable habitat is present, however there are no known CNDDDB occurrences within 5 miles.
<i>Tortula californica</i> California screw-moss	None/None G2G3/S2S3 1B.2BLM_S- Sensitive	Chenopod scrub, Valley and foothill grassland. sandy, soil. 10 - 1460 m. moss. Blooms	Not Expected	Suitable habitat is present, however there are no known CNDDDB occurrences within 5 miles.
<i>Viola pinetorum</i> ssp. <i>grisea</i> grey-leaved violet	None/None G4G5T3/S3 1B.2	Meadows and seeps, Subalpine coniferous forest, Upper montane coniferous forest. 1500 - 3400 m. perennial herb. Blooms Apr- Jul	Not Expected	There are no known CNDDDB occurrences within 5 miles and the site is out of the species elevation range.

Regional Vicinity refers to within a 20-quad search radius of site.

FE = Federally Endangered FT = Federally Threatened FC = Federal Candidate Species

SE = State Endangered ST = State Threatened SC = State Candidate SR = State Rare

CRPR (CNPS California Rare Plant Rank):

1A=Presumed Extinct in California

1B=Rare, Threatened, or Endangered in California and elsewhere

2A=Plants presumed extirpated in California, but more common elsewhere

2B=Plants Rare, Threatened, or Endangered in California, but more common elsewhere

CRPR Threat Code Extension:

.1=Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)

.2=Fairly endangered in California (20-80% occurrences threatened)

.3=Not very endangered in California (<20% of occurrences threatened)

Special-status Animal Species in the Regional Vicinity of the Project Site

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
Invertebrates				
<i>Bombus crotchii</i> Crotch bumble bee	None/SCE G3G4/S1S2	Coastal California east to the Sierra-Cascade crest and south into Mexico. Food plant genera include <i>Antirrhinum</i> , <i>Phacelia</i> , <i>Clarkia</i> , <i>Dendromecon</i> , <i>Eschscholzia</i> , and <i>Eriogonum</i> .	Not Expected	There are 2 known CNDDDB occurrences within 5 miles, however these occurrences are historical (1952, 1954) and suitable plant food genera are not present.
<i>Desmocerus californicus dimorphus</i> valley elderberry longhorn beetle	FT/None G3T2/S2	Occurs only in the Central Valley of California, in association with blue elderberry (<i>Sambucus mexicana</i>). Prefers to lay eggs in elderberries 2-8 inches in diameter; some preference shown for stressed elderberries.	Not Expected	There are no known CNDDDB occurrences within 5 miles and suitable elderberry habitat is not present.
Reptiles				
<i>Anniella grinnelli</i> Bakersfield legless lizard	None/None G2G3/S2S3 CDFW_SSC- Species of Special Concern	Southern San Joaquin Valley. Known from two disjunct areas: the east side of the Carrizo Plain and portions of the city limits of Bakersfield. Microhabitat of this species is poorly known. Other legless lizard species occur in sparsely vegetated areas with moist, loose soil. Often found underneath leaf litter, rocks, and logs.	Not Expected	There is one known CNDDDB occurrence within 5 miles near the Sand Ridge Preserve east of the site, but no suitable habitat is present.
<i>Anniella</i> spp. California legless lizard	None/None G3G4/S3S4 CDFW_SSC- Species of Special Concern	Contra Costa County south to San Diego, within a variety of open habitats. This element represents California records of <i>Anniella</i> not yet assigned to new species within the <i>Anniella pulchra</i> complex. Variety of habitats; generally in moist, loose soil. They prefer soils with a high moisture content.	Not Expected	There are 2 known CNDDDB occurrences within 5 miles. However, these occurrences are historical (1939, 1955), and suitable habitat is not present.
<i>Anniella stebbinsi</i> southern California legless lizard	None/None G3/S3 CDFW_SSC- Species of Special Concern USFS_S-Sensitive	Generally south of the Transverse Range, extending to northwestern Baja California. Occurs in sandy or loose loamy soils under sparse vegetation. Disjunct populations in the Tehachapi and Piute Mountains in Kern County. Variety of habitats; generally in moist, loose soil. They prefer soils with a high moisture content.	Not Expected	Suitable habitat is not present, and there are no known CNDDDB occurrences within 5 miles.

Arvin-Edison Water Storage District (AEWSD) Groundwater Service Area (GWSA) Project

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
<i>Arizona elegans occidentalis</i> California glossy snake	None/None G5T2/S2 CDFW_SSC- Species of Special Concern	Patchily distributed from the eastern portion of San Francisco Bay, southern San Joaquin Valley, and the Coast, Transverse, and Peninsular ranges, south to Baja California. Generalist reported from a range of scrub and grassland habitats, often with loose or sandy soils.	Low Potential	There are 8 known CNDDDB occurrences within 5 miles, most of which occur west of the site along Hwy 99, but no suitable grassland or scrub habitat is present.
<i>Emys marmorata</i> western pond turtle	None/None G3G4/S3 BLM_S-Sensitive CDFW_SSC- Species of Special Concern IUCN_VU- Vulnerable USFS_S-Sensitive	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	Not Expected	There is one known CNDDDB occurrence within 5 miles, however suitable aquatic habitat is not present.
<i>Gambelia sila</i> blunt-nosed leopard lizard	FE/SE G1/S1 CDFW_FP-Fully Protected	Resident of sparsely vegetated alkali and desert scrub habitats, in areas of low topographic relief. Seeks cover in mammal burrows, under shrubs or structures such as fence posts; they do not excavate their own burrows.	Low Potential	There are 12 known CNDDDB occurrences within 5 miles, one of which is within the BSA, southeast of Arvin. However, the occurrence was in 1991 and suitable habitat is almost non-existent due to agriculture.
<i>Masticophis flagellum ruddocki</i> San Joaquin coachwhip	None/None G5T2T3/S2? CDFW_SSC- Species of Special Concern	Open, dry habitats with little or no tree cover. Found in valley grassland and saltbush scrub in the San Joaquin Valley. Needs mammal burrows for refuge and oviposition sites.	Low Potential	There is one known CNDDDB occurrence within 5 miles, but no suitable habitat is present.
<i>Phrynosoma blainvillii</i> coast horned lizard	None/None G3G4/S3S4 BLM_S-Sensitive CDFW_SSC- Species of Special Concern IUCN_LC-Least Concern	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.	Low Potential	Limited suitable habitat is present, however there are no known CNDDDB occurrences within 5 miles.
<i>Thamnophis hammondi</i> two-striped gartersnake	None/None G4/S3S4 BLM_S-Sensitive CDFW_SSC- Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive	Coastal California from vicinity of Salinas to northwest Baja California. From sea to about 7,000 ft elevation. Highly aquatic, found in or near permanent fresh water. Often along streams with rocky beds and riparian growth.	Not Expected	Suitable perennial aquatic habitat is not present and there are no known CNDDDB occurrences within 5 miles.

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
<i>Xantusia vigilis sierrae</i> Sierra night lizard	None/None G5T1/S1 CDFW_SSC- Species of Special Concern USFS_S-Sensitive	Only on the western edge of the Greenhorn Mountains in Kern County in small granite outcrops in open grassland or oak woodland. Found under exfoliating granite caps and flakes.	Not Expected	Suitable habitat is not present and there are no known CNDDDB occurrences within 5 miles.
Amphibians				
<i>Batrachoseps relictus</i> relictual slender salamander	None/None G1/S1 CDFW_SSC- Species of Special Concern IUCN_DD-Data Deficient USFS_S-Sensitive	Mixed coniferous forest on the western slope of southern Sierra Nevada, from south side of the Kern River Canyon to Breckenridge Mtn. Usually found under boards, rotting logs, rocks and surface litter in very close proximity to, or in water.	Not Expected	There is one known CNDDDB occurrence within 5 miles. However, this occurrence is historical (1967) and there is no suitable habitat present.
<i>Batrachoseps simatus</i> Kern Canyon slender salamander	None/ST G2G3/S2S3 IUCN_VU- Vulnerable USFS_S-Sensitive	Only in the lower Kern River Canyon in valley-foothill hardwood, valley-foothill hardwood-conifer, & mixed chaparral. Found under downed pine, oak and chaparral scrub logs, as well as under rocks and talus on steep, north-facing slopes.	Not Expected	Suitable habitat is not present and there are no known CNDDDB occurrences within 5 miles
<i>Batrachoseps stebbinsi</i> Tehachapi slender salamander	None/ST G2/S2S3 BLM_S-Sensitive IUCN_VU- Vulnerable	Valley-foothill hardwood-conifer & valley-foothill riparian in the Piute and Tehachapi mountains of Kern County. Prefers wet talus slopes or log-strewn hillsides with a steep, north-facing exposure.	Not Expected	Suitable riparian habitat is not present and there are no known CNDDDB occurrences within 5 miles
<i>Ensatina eschscholtzii croceater</i> yellow-blotched salamander	None/None G5T3/S3 BLM_S-Sensitive CDFW_WL-Watch List USFS_S-Sensitive	Forests and well-shaded canyons, as well as oak woodlands and old chaparral. Needs surface objects, such as logs, boards, and rocks. Also needs old rodent burrows or other underground retreats.	Not Expected	Suitable habitat is not present and there are no known CNDDDB occurrences within 5 miles.
<i>Rana boylei</i> foothill yellow-legged frog	None/SCT G3/S3 BLM_S-Sensitive CDFW_SSC- Species of Special Concern IUCN_NT-Near Threatened USFS_S-Sensitive	Partly shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Needs at least some cobble-sized substrate for egg-laying. Needs at least 15 weeks to attain metamorphosis.	Not Expected	Suitable habitat is not present and there are no known CNDDDB occurrences within 5 miles.

Arvin-Edison Water Storage District (AEWSD) Groundwater Service Area (GWSA) Project

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
<i>Spea hammondi</i> western spadefoot	None/None G3/S3 BLM_S-Sensitive CDFW_SSC- Species of Special Concern IUCN_NT-Near Threatened	Occurs primarily in grassland habitats but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying.	Not Expected	There is one known CNDDDB occurrences within 5 miles, approximately 0.9 miles northeast of the site. However, suitable habitat is not present.
Birds				
<i>Accipiter cooperii</i>	None/None G5/S4 CDFW_WL IUCN_LC-Least Concern	Woodland, chiefly of open, interrupted or marginal type. Nest sites mainly in live oaks or riparian growths of deciduous trees, as in canyon bottoms on river flood-plains.	Present	Observed within the project area during the field reconnaissance survey.
<i>Agelaius tricolor</i> tricolored blackbird	None/ST G2G3/S1S2 BLM_S-Sensitive CDFW_SSC- Species of Special Concern IUCN_EN- Endangered NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern	Highly colonial species, most numerous in Central Valley & vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony.	Not Expected	There are no known CNDDDB occurrences within 5 miles and suitable nesting habitat is not present.
<i>Asio otus</i> long-eared owl	None/None G5/S3? CDFW_SSC- Species of Special Concern IUCN_LC-Least Concern	Riparian bottomlands grown to tall willows and cottonwoods; also, belts of live oak paralleling stream courses. Require adjacent open land, productive of mice and the presence of old nests of crows, hawks, or magpies for breeding.	Not Expected	There are 2 known CNDDDB occurrences within 5 miles, one of which is historical (1974). However, suitable riparian habitat is not present.
<i>Athene cunicularia</i> burrowing owl	None/None G4/S3 BLM_S-Sensitive CDFW_SSC- Species of Special Concern IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	High Potential	Suitable burrow habitat is present and there are 22 known CNDDDB occurrences within 5 miles.

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
<i>Buteo swainsoni</i> Swainson's hawk	None/ST G5/S3 BLM_S-Sensitive IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, & agricultural or ranch lands with groves or lines of trees. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	High Potential	Suitable foraging habitat is present and there are 3 known CNDDDB occurrences within 5 miles. A small number of ornamental trees within the BSA could provide suitable nesting habitat.
<i>Gymnogyps californianus</i> California condor	FE/SE G1/S1 CDF_S-Sensitive CDFW_FP-Fully Protected IUCN_CR- Critically Endangered NABCI_RWL-Red Watch List	Require vast expanses of open savannah, grasslands, and foothill chaparral in mountain ranges of moderate altitude. Deep canyons containing clefts in the rocky walls provide nesting sites. Forages up to 100 miles from roost/nest.	Not Expected	Suitable nesting and foraging habitat are not present and there are no known CNDDDB occurrences within 5 miles.
<i>Haliaeetus leucocephalus</i> bald eagle	FD/SE G5/S3 BLM_S-Sensitive CDF_S-Sensitive CDFW_FP-Fully Protected IUCN_LC-Least Concern USFS_S-Sensitive USFWS_BCC-Birds of Conservation Concern	Ocean shore, lake margins, and rivers for both nesting and wintering. Most nests within 1 mile of water. Nests in large, old-growth, or dominant live tree with open branches, especially ponderosa pine. Roosts communally in winter.	Not Expected	Suitable nesting and foraging habitat are not present and there are no known CNDDDB occurrences within 5 miles.
<i>Progne subis</i> purple martin	None/None G5/S3 CDFW_SSC- Species of Special Concern IUCN_LC-Least Concern	Inhabits woodlands, low elevation coniferous forest of Douglas-fir, ponderosa pine, and Monterey pine. Nests in old woodpecker cavities mostly; also in human-made structures. Nest often located in tall, isolated tree/snag.	Not Expected	Suitable nesting and foraging habitat are not present and there are no known CNDDDB occurrences within 5 miles.
<i>Vireo bellii pusillus</i> least Bell's vireo	FE/SE G5T2/S2 IUCN_NT-Near Threatened NABCI_YWL- Yellow Watch List	Summer resident of Southern California in low riparian in vicinity of water or in dry river bottoms; below 2000 ft. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, Baccharis, mesquite.	Not Expected	There is 1 known CNDDDB occurrence within 5 miles, however the occurrence is historical (1978) and suitable riparian habitat is not present.

Arvin-Edison Water Storage District (AEWSD) Groundwater Service Area (GWSA) Project

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
Mammals				
<i>Ammospermophilus nelsoni</i> Nelson's antelope squirrel	None/ST G2/S2S3 BLM_S-Sensitive IUCN_EN- Endangered	Western San Joaquin Valley from 200-1200 ft elev. On dry, sparsely vegetated loam soils. Dig burrows or use k-rat burrows. Need widely scattered shrubs, forbs and grasses in broken terrain with gullies and washes.	Low Potential	Suitable burrow habitat is present, however there are no known CNDDDB occurrences within 5 miles.
<i>Antrozous pallidus</i> pallid bat	None/None G5/S3 BLM_S-Sensitive CDFW_SSC- Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive WBWG_H-High Priority	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	Not Expected	Suitable roosting habitat is not present and there are no known CNDDDB occurrences within 5 miles.
<i>Dipodomys nitratoideus</i> Tipton kangaroo rat	FE/SE G3T1T2/S1S2 IUCN_VU- Vulnerable	Saltbrush scrub and sink scrub communities in the Tulare Lake Basin of the southern San Joaquin Valley. Needs soft friable soils which escape seasonal flooding. Digs burrows in elevated soil mounds at bases of shrubs.	Low Potential	Some suitable burrow habitat is present and there are 5 known CNDDDB occurrences within 5 miles.
<i>Eumops perotis californicus</i> western mastiff bat	None/None G5T4/S3S4 BLM_S-Sensitive CDFW_SSC- Species of Special Concern WBWG_H-High Priority	Many open, semi-arid to arid habitats, including conifer & deciduous woodlands, coastal scrub, grasslands, chaparral, etc. Roosts in crevices in cliff faces, high buildings, trees and tunnels.	Not Expected	There is one known CNDDDB occurrence within 5 miles. However, the occurrence is located northwest of the site, near Bakersfield and no suitable roosting habitat is present.
<i>Onychomys torridus</i> <i>tularensis</i> Tulare grasshopper mouse	None/None G5T1T2/S1S2 BLM_S-Sensitive CDFW_SSC- Species of Special Concern	Hot, arid valleys and scrub deserts in the southern San Joaquin Valley. Diet almost exclusively composed of arthropods, therefore needs abundant supply of insects.	Not Expected	There are 2 known CNDDDB occurrences within 5 miles. However, both occurrences are historical (1918) and there is limited suitable habitat present.
<i>Perognathus alticola</i> <i>inexpectatus</i> Tehachapi pocket mouse	None/None G1G2T1T2/S1S2 CDFW_SSC- Species of Special Concern IUCN_EN- Endangered USFS_S-Sensitive	Arid annual grassland and desert shrub communities, but also taken in fallow grain fields and in Russian thistle. Burrows for cover and nesting. Aestivates and hibernates during extreme weather. Forages on open ground and under shrubs.	Low Potential	Suitable burrow habitat is present, however there are no known CNDDDB occurrences within 5 miles.

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
<i>Sorex ornatus relictus</i> Buena Vista Lake ornate shrew	FE/None G5T1/S1 CDFW_SSC- Species of Special Concern	Marshlands and riparian areas in the Tulare Basin. Prefers moist soil. Uses stumps, logs and litter for cover.	Not Expected	Suitable habitat is not present and there are no known CNDDDB occurrences within 5 miles.
<i>Taxidea taxus</i> American badger	None/None G5/S3 CDFW_SSC- Species of Special Concern IUCN_LC-Least Concern	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	Moderate Potential	Suitable burrow habitat (greater than 4 inches in diameter) and friable soils are present and there are 5 known CNDDDB occurrences within 5 miles.
<i>Vulpes macrotis mutica</i> San Joaquin kit fox	FE/ST G4T2/S2	Annual grasslands or grassy open stages with scattered shrubby vegetation. Need loose-textured sandy soils for burrowing, and suitable prey base.	Moderate Potential	Suitable burrow habitat (greater than 4 inches in diameter) is present and there are 16 known CNDDDB occurrences within 5 miles. Typical denning or foraging habitat is not present, but the site could be used for temporary denning during dispersal.
Regional Vicinity refers to within a 20-quad search radius of site.				
FE = Federally Endangered FT = Federally Threatened FC = Federal Candidate Species FS = Federally Sensitive				
SE = State Endangered ST = State Threatened SC = State Candidate SS = State Sensitive				
SSC = CDFW Species of Special Concern SFP = State Fully Protected WL = CDFW Watch List				

This page intentionally left blank.

Appendix C

Cultural Phase 1 Survey Report

**PHASE I SURVEY,
ARVIN-EDISON WATER STORAGE
DISTRICT GROUNDWATER SERVICE
AREA PIPELINE PROJECT,
KERN COUNTY, CALIFORNIA**

Prepared for:

Ms. Briza Sholars
Provost & Pritchard Consulting Group
206 West Cromwell Avenue
Fresno, CA 93711-2715

Prepared by:

David S. Whitley, Ph.D., RPA

Peter A. Carey, M.A., RPA

and

Robert Azpitarte, B.A.

ASM Affiliates, Inc.
20424 West Valley Blvd., Suite A
Tehachapi, California 93561

January 2021
PN 35210.00

Page is intentionally blank

TABLE OF CONTENTS

<u>Chapter</u>	<u>Page</u>
MANAGEMENT SUMMARY	iii
1. INTRODUCTION AND REGULATORY CONTEXT	1
1.1 PROJECT LOCATION AND STUDY AREA	1
1.2 PROJECT DESCRIPTION.....	1
1.3 REGULATORY CONTEXT.....	2
1.3.1 CEQA	2
2. ENVIRONMENTAL AND CULTURAL BACKGROUND	5
2.1 ENVIRONMENTAL BACKGROUND AND GEOARCHAEOLOGICAL SENSITIVITY	5
2.2 ETHNOGRAPHIC BACKGROUND	5
2.3 PRE-CONTACT ARCHAEOLOGICAL BACKGROUND.....	7
2.4 HISTORICAL BACKGROUND.....	9
2.5 RESEARCH DESIGN	12
2.5.1 Pre-Contact Archaeology	12
2.5.2 Historical Archaeology: Native American.....	13
2.5.3 Historical Archaeology: Euro-American.....	14
2.5.4 Significant Themes.....	15
3. ARCHIVAL RECORDS SEARCH.....	21
3.1 ARCHIVAL RECORDS SEARCH.....	21
4. METHODS AND RESULTS.....	27
4.1 FIELD METHODS.....	27
4.2 SURVEY RESULTS	27
4.2.1 Previously Recorded Resources	27
4.2.2 Newly Identified Resources	30
5. SUMMARY AND RECOMMENDATIONS.....	31
5.1 ELIGIBILITY EVALUATION AND RECOMMENDATIONS.....	31
REFERENCES.....	33
CONFIDENTIAL APPENDICES	37

LIST OF FIGURES

		<u>Page</u>
Figure 1a.	Location of the AEWSD Groundwater Service Area Project, Kern County, California.	Confidential Appendix A
Figure 1b.	Map key, AEWSD Groundwater Service Area Project.	Confidential Appendix A
Figure 1c.	Study Area Map A.	Confidential Appendix A
Figure 1d.	Study Area Map B.	Confidential Appendix A
Figure 1e.	Study Area Map C.	Confidential Appendix A
Figure 1f.	Study Area Map D.	Confidential Appendix A
Figure 1g.	Study Area Map E.	Confidential Appendix A
Figure 1h.	Study Area Map F.	Confidential Appendix A
Figure 1i.	Study Area Map G.	Confidential Appendix A
Figure 1j.	Study Area Map H.	Confidential Appendix A
Figure 1k.	Study Area Map I.	Confidential Appendix A
Figure 1l.	Study Area Map J.	Confidential Appendix A
Figure 1m.	Study Area Map K.	Confidential Appendix A
Figure 1n.	Study Area Map L.	Confidential Appendix A
Figure 1o.	Study Area Map M.	Confidential Appendix A

LIST OF TABLES

		<u>Page</u>
Table 1.	Survey Reports within the Study Area.	21
Table 2.	Survey Reports within 0.5-miles of the Study Area.	22
Table 3.	Resources within the Study Area.	24
Table 4.	Resources within 0.5-miles of the Study Area.	24
Table 5.	USGS Topographical Quadrangles Examined.	25
Table 6.	P-15-003545 Investigated Segments.	28
Table 7.	P-15-007994 Investigated Segments.	28
Table 8.	P-15-017243 Investigated Segments.	29
Table 9.	P-15-017582 Investigated Segments.	29
Table 10.	P-15-019115 Investigated Segments.	30

MANAGEMENT SUMMARY

A Phase I survey was conducted for the Arvin – Edison Water Storage District (AEWSD) Groundwater Service Area (GWSA) Project (Project), Kern County, California. The study area for the Project consisted of 71.8-miles (mi) of proposed pipelines, manholes, and turnouts. ASM Affiliates, Inc., conducted this study, with David S. Whitley, Ph.D., RPA, serving as principal investigator. The study was undertaken to assist with compliance with the California Environmental Protection Act (CEQA).

A records search of site files and maps was conducted for the study area on 10 August 2020 at the Southern San Joaquin Valley Information Center (IC), California State University, Bakersfield. A Sacred Lands File records search was also received from the Native American Heritage Commission (NAHC). The IC records search indicated that 19 previous archaeological surveys had been completed that covered portions of the study area. An additional 25 previous archaeological surveys had been conducted within 0.5-mi of the study area. The records search indicates that 6 archaeological resources are known to exist within the study area, with an additional 22 archaeological resources within 0.5-mi radius. The NAHC *Sacred Lands File* did not indicate the presence of any cultural places within the study area.

The Phase I survey fieldwork was conducted in August and September 2020. The study area consists of the 71.8-mi of proposed pipelines, manholes, and turnouts with an added 15-meter (m) survey buffer on both sides of the pipeline route, resulting in a study area that is 860-ac. The study area was surveyed using parallel transects spaced at 15-m intervals along the pipeline routes.

A total of nine cultural resources (six previously recorded and three newly identified) were recorded during the survey. The six previously recorded resources include segments of Tejon Highway (P-15-003545), segments of the Arvin-Edison Canal (P-15-007994), a historic water well (P-15-020334), and segments of three transmission lines (P-15-017243, -017582, and -019115). The three newly identified resources include one historical water conveyance system and two isolated artifacts. All were given temporary field designations. The newly identified water conveyance system (AEWSD-RA-1) is a segment of Tejon Creek.

Page is intentionally blank

1. INTRODUCTION AND REGULATORY CONTEXT

ASM Affiliates, Inc. was retained by Provost & Pritchard Consulting Group to conduct a Phase I cultural resources survey for the AEWSD Groundwater Service Area Pipeline Project. The Project study area consists of approximately 71.8-mi linear miles extending across the District within the southeastern end of the San Joaquin Valley, Kern County, California. The Phase I survey was undertaken to assist with compliance with CEQA. The investigation was conducted, specifically, to ensure that significant impacts or adverse effects to historical resources or historic properties do not occur as a result of project construction.

This current study included:

- A background records search and literature review to determine if any known cultural resources were present in the project zone and/or whether the area had been previously and systematically studied by archaeologists;
- An on-foot, intensive inventory of the 71.8-mi linear study area to identify and record previously undiscovered cultural resources and to examine known sites; and
- A preliminary assessment of any such resources found within the subject property.

David S. Whitley, Ph.D., RPA, served as principal investigator for the Project and ASM Associate Archaeologist Robert Azpitarte B.A., conducted the fieldwork, with assistance in the field from ASM Assistant Archaeologists Maria Silva, B.A., Margarita Lemus, B.A., and Stacey Escamilla, B.A.

This document constitutes a report on the Phase I survey. Subsequent chapters provide background to the investigation, including historic context studies; the findings of the archival records search; Native American outreach; a summary of the field surveying techniques employed; and the results of the fieldwork. We conclude with management recommendations for the study area.

1.1 PROJECT LOCATION AND STUDY AREA

The study area is located adjacent to farm fields and orchards east of the Interstate-5 freeway, from Highway 58 in the north to the Tejon Ranch in the south, in the southeastern corner of the San Joaquin Valley. The study area for the Project consists of 71.8-mi of proposed pipeline, manholes, and turnouts. A 15-m buffer was surveyed on both sides of the pipeline route, creating a 30-m survey corridor and an 860-ac study area (Figure 1a – 1o, Confidential Appendix A).

1.2 PROJECT DESCRIPTION

AEWSD currently provides surface water to irrigate lands in its Surface Water Service Area (SWSA). In recent years, AEWSD has delivered surface water under Temporary Water Service Contracts (Temporary Water) to certain GWSA lands when surface water supplies are available beyond the needs of the SWSA and as existing facilities allow for such Temporary Water delivery in order to maximize the use of the District's surface water supplies.

The proposed Project consists of the construction of approximately 71.8-mi of pipelines, manholes and turnouts within AEWSD. The Project goal is to deliver wet-period surface water to landowners who would otherwise pump groundwater. The proposed pipelines will be operated when excess surface water is available (approximately every three years) and/or when water transfers are scheduled. The proposed pipelines will be low-head gravity distribution pipelines ranging from 12-inch (in) to 72-in in diameter. The largest pipe sizes would be proportionally short distances near the heads of the branching gravity pipeline networks serving the various private agricultural fields and orchards in the study area. The proposed pipeline sizes and capacities will vary depending upon the number of acres served. Pipeline sizing will follow the conservative value of eight gallons per minute per acre. The proposed pipelines will commence from various existing AEWSD facilities, such as the Forrest Frick Pipeline, North Canal, South Canal, or other smaller lateral pipelines.

All proposed pipelines will deliver irrigation surface water to various proposed private farmland turnouts. The vast majority of proposed pipeline alignments will be installed on private agricultural property parallel to existing public county road rights-of-way (ROW) or along existing private dirt farm roads between fields/orchards using the traditional cut-and-cover construction method. Short segments of the proposed pipelines will cross public county road ROWs and will require an encroachment permit from Kern County. If Kern County requires through traffic during pipeline construction, some of these short pipeline segments may be constructed using the jack and bore construction method. All proposed pipeline alignments will avoid existing structures, utilities, permanent crops, and sensitive habitats whenever possible.

1.3 REGULATORY CONTEXT

1.3.1 CEQA

CEQA is applicable to discretionary actions by state or local lead agencies. Under CEQA, lead agencies must analyze impacts to cultural resources. Significant impacts under CEQA occur when “historically significant” or “unique” cultural resources are adversely affected, which occurs when such resources could be altered or destroyed through project implementation. Historically significant cultural resources are defined by eligibility for or by listing in the California Register of Historical Resources (CRHR). In practice, the federal NRHP criteria (below) for significance applied under Section 106 are generally (although not entirely) consistent with CRHR criteria (see PRC § 5024.1, Title 14 CCR, Section 4852 and § 15064.5(a)(3)).

Significant cultural resources are those archaeological resources and historical properties that:

- (A) Are associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage;
- (B) Are associated with the lives of persons important in our past;
- (C) Embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual, or possess high artistic values; or
- (D) Have yielded, or may be likely to yield, information important in prehistory or history.

Unique resources under CEQA, in slight contrast, are those that represent:

An archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- (1) Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
- (2) Has a special and particular quality such as being the oldest of its type or the best available example of its type.
- (3) Is directly associated with a scientifically recognized important prehistoric or historic event or person (PRC § 21083.2(g)).

Preservation in place is the preferred approach under CEQA to mitigating adverse impacts to significant or unique cultural resources.

Page is intentionally blank

2. ENVIRONMENTAL AND CULTURAL BACKGROUND

2.1 ENVIRONMENTAL BACKGROUND AND GEOARCHAEOLOGICAL SENSITIVITY

The study area falls within the 132,000-ac AEWS D service area. This is located on the open flats of the southeastern San Joaquin Valley, with elevation ranging from roughly 400-ft above mean sea level (amsl) on the west to about 1,000-ft amsl on the east, near the foothills of the Tehachapi Mountains. This general area represents the alluvial plain east of the edge of historic Kern Lake. Prior to the appearance of agriculture, starting in the nineteenth century, this location would have been valley grasslands and perhaps oak woodlands closer to the eastern valley edge (*cf.* Schoenner 1992). The AEWS D currently consists almost entirely of agricultural lands: in 2003, approximately 24% of the service area contained truck crops, 23% vineyards, 11% citrus, 8% fields, 8% deciduous, 7% grains and hay, and 5% is urban (AEWS D 2003).

According to the geoarchaeological model developed by Meyer et al. (2010), the study area has a low to moderate potential for buried archaeological deposits.

2.2 ETHNOGRAPHIC BACKGROUND

Penutian-speaking Yokuts tribal groups occupied the southern San Joaquin Valley region and much of the nearby Sierra Nevada. Ethnographic information about the Yokuts was collected primarily by Powers (1971, 1976 [originally 1877]), Kroeber (1925), Gayton (1930, 1948), Driver (1937), Latta (1977) and Harrington (n.d.). For a variety of historical reasons, existing research information emphasizes the central Yokuts tribes who occupied both the valley and particularly the foothills of the Sierra. The northernmost tribes suffered from the influx of Euro-Americans during the Gold Rush and their populations were in substantial decline by the time ethnographic studies began in the early twentieth century. In contrast, the southernmost tribes were partially removed by the Spanish to missions and eventually absorbed into multi-tribal communities on the Sebastian Indian Reservation (on Tejon Ranch), and later the Tule River Reservation and Santa Rosa Rancheria to the north. The result is an unfortunate scarcity of ethnographic detail on southern Valley tribes, especially in relation to the rich information collected from the central foothills tribes where native speakers of the Yokuts dialects are still found. Regardless, the general details of indigenous life-ways were similar across the broad expanse of Yokuts territory, particularly in terms of environmentally influenced subsistence and adaptation and with regard to religion and belief, which were similar everywhere.

Kroeber (1925: Plate 47) indicates that the study area most likely lies in Hometwoli Yokuts territory with the principal historic village for this group being *Pohalin Tinliu*, located on the south shore of Kern Lake. Similarly, Latta (1977) shows *Pohalin Tínleu* (Kroeber's *Pohalin Tinliu*) as the nearest village to the study area; however, he indicates that village was in Halaumne (i.e., Yaulumne) Yokuts territory.

Regardless of specific tribal affiliation, the Yokuts settlement pattern was largely consistent across distinct tribes. Winter villages were typically located along lakeshores and major stream courses (as these existed circa AD 1800), with dispersal phase family camps located at elevated spots on the valley floor and near gathering areas in the foothills.

Most Yokuts groups, again regardless of specific tribal affiliation, were organized as a recognized and distinct tribelet; a circumstance that almost certainly pertained to the tribal groups noted above. Tribelets were land-owning groups organized around a central village and linked by shared territory and descent from a common ancestor. The population of most tribelets ranged from about 150 to 500 peoples (Kroeber 1925).

Each tribelet was headed by a chief who was assisted by a variety of assistants, the most important of whom was the *winatum*, a herald or messenger and assistant chief. A shaman also served as religious officer. While shamans did not have any direct political authority, as Gayton (1930) has illustrated, they maintained substantial influence within their tribelet.

Shamanism is a religious system common to most Native American tribes. It involves a direct and personal relationship between the individual and the supernatural world enacted by entering a trance or hallucinatory state (usually based on the ingestion of psychotropic plants, such as jimsonweed or more typically native tobacco). Shamans were considered individuals with an unusual degree of supernatural power, serving as healers or curers, diviners, and controllers of natural phenomena (such as rain or thunder). Shamans also produced the rock art of this region, depicting the visions they experienced in vision quests believed to represent their spirit helpers and events in the supernatural realm (Whitley 1992, 2000).

The centrality of shamanism to the religious and spiritual life of the Yokuts was demonstrated by the role of shamans in the yearly ceremonial round. The ritual round, performed the same each year, started in the spring with the jimsonweed ceremony, followed by rattlesnake dance and (where appropriate) first salmon ceremony. After returning from seed camps, fall rituals began in the late summer with the mourning ceremony, followed by first seed and acorn rites and then bear dance (Gayton 1930:379). In each case, shamans served as ceremonial officials responsible for specific dances involving a display of their supernatural powers (Kroeber 1925).

Subsistence practices varied from tribelet to tribelet based on the environment of residence. Throughout Native California, and Yokuts territory in general, the acorn was a primary dietary component, along with a variety of gathered seeds. Valley tribes augmented this resource with lacustrine and riverine foods, especially fish and wildfowl. As with many Native California tribes, the settlement and subsistence rounds included the winter aggregation into a few large villages, where stored resources (like acorns) served as staples, followed by dispersal into smaller camps, often occupied by extended families, where seasonally available resources would be gathered and consumed.

Although population estimates vary and population size was greatly affected by the introduction of Euro-American diseases and social disruption, the Yokuts were one of the largest, most successful groups in Native California. Cook (1978) estimates that the Yokuts region contained 27

percent of the aboriginal population in the state at the time of contact; other estimates are even higher. Many Yokuts people continue to reside in the southern San Joaquin Valley today.

2.3 PRE-CONTACT ARCHAEOLOGICAL BACKGROUND

The southern San Joaquin Valley region has received minimal archaeological attention compared to other areas of the state. In part, this is because the majority of California archaeological work has concentrated in the Sacramento Delta, Santa Barbara Channel, and central Mojave Desert areas (see Moratto 1984). Although knowledge of the region's prehistory is limited, enough is known to determine that the archaeological record is broadly similar to south-central California as a whole (see Gifford and Schenk 1926; Hewes 1941; Wedel 1941; Fenenga 1952; Elsasser 1962; Fredrickson and Grossman 1977; Schiffman and Garfinkel 1981). Based on these sources, the general prehistory of the region can be outlined as follows.

Initial occupation of the region occurred at least as early as the *Paleoindian Period*, or prior to about 10,000 years before present (YBP). Evidence of early use of the region is indicated by characteristic fluted and stemmed points found around the margin of Tulare Lake, in the foothills of the Sierra, and in the Mojave Desert proper.

Both fluted and stemmed points are particularly common around lake margins, suggesting a terminal Pleistocene/early Holocene lakeshore adaptation similar to that found throughout the far west at the same time; little else is known about these earliest peoples. Over 250 fluted points have been recovered from the Witt Site (CA-KIN-32), located along the western shoreline of ancient Tulare Lake north of the study area, demonstrating the importance of this early occupation in the San Joaquin Valley specifically (see Fenenga 1993). Additional finds consist of a Clovis-like projectile point discovered in a flash-flood cut-bank near White Oak Lodge in 1953 on Tejon Ranch (Glennan 1987a, 1987b). More recently, a similar fluted point was found near Bakersfield (Zimmerman et al. 1989), and a number are known from the Edwards Air Force Base and Boron area of the western Mojave Desert. Although human occupation of the state is well-established during the Late Pleistocene, relatively little can be inferred about the nature and distribution of this occupation with a few exceptions. First, little evidence exists to support the idea that people at that time were big-game hunters, similar to those found on the Great Plains. Second, the western Mojave Desert evidence suggests small, very mobile populations that left a minimal archaeological signature. The evidence from the ancient Tulare Lake shore, in contrast, suggests much more substantial population and settlements which, instead of relying on big game hunting, were tied to the lacustrine lake edge. Variability in subsistence and settlement patterns is thus apparent in California, in contrast to the Great Plains.

Substantial evidence for human occupation across California, however, first occurs during the middle Holocene, roughly 7,500 to 4,000 YBP. This period is known as the *Early Horizon*, or alternatively as the Early Millingstone along the Santa Barbara Channel. In the south, populations concentrated along the coast with minimal visible use of inland areas. Adaptation emphasized hard seeds and nuts with tool-kits dominated by mullers and grindstones (manos and metates). Additionally, little evidence for Early Horizon occupation exists in most inland portions of the state, partly due to a severe cold and dry paleoclimatic period occurring at this time, although a site deposit dating to this age has been identified along the ancient Buena Vista shoreline in Kern

County to the south (Rosenthal et al. 2007). Regardless of specifics, Early Horizon population density was low with a subsistence adaptation more likely tied to plant food gathering than hunting.

Environmental conditions improved dramatically after about 4,000 YBP during the *Middle Horizon* (or Intermediate Period). This period is known climatically as the Holocene Maximum (circa 3,800 YBP) and was characterized by significantly warmer and wetter conditions than previously experienced. It was marked archaeologically by large population increase and radiation into new environments along coastal and interior south-central California and the Mojave Desert (Whitley 2000). In the Delta region to the north, this same period of favorable environmental conditions was characterized by the appearance of the Windmill culture which exhibited a high degree of ritual elaboration (especially in burial practices) and perhaps even a rudimentary mound-building tradition (Meighan, personal communication, 1985). Along with ritual elaboration, Middle Horizon times experienced increasing subsistence specialization, perhaps correlating with the appearance of acorn processing technology. Penutian speaking peoples (including the Yokuts) are also posited to have entered the state roughly at the beginning of this period and, perhaps to have brought this technology with them (cf. Moratto 1984). Likewise, it appears the so-called "Shoshonean Wedge" in southern California, the Takic speaking groups that include the Gabrielino/Fernandeño, Tataviam and Kitanemuk, may have moved into the region at that time (Sutton 2009, rather than at about 1500 YBP as first suggested by Kroeber (1925).

Evidence for Middle Horizon occupation of interior south-central California is substantial. For example, in northern Los Angeles County along the upper Santa Clara River, to the south of the San Joaquin Valley, the Agua Dulce village complex indicates occupation extending back to the Intermediate Period, when the population of the village may have been 50 or more people (King et al n.d.). Similarly, inhabitation of the Hathaway Ranch region near Lake Piru, and the Newhall Ranch near Valencia, appears to date to the Intermediate Period (W & S Consultants 1994). To the west, little or no evidence exists for pre-Middle Horizon occupation in the upper Sisquoc and Cuyama River drainages; populations first appear there at roughly 3,500 YBP (Horne 1981). The Carrizo Plain, the valley immediately west of the San Joaquin, experienced a major population expansion during the Middle Horizon (W & S Consultants 2004; Whitley et al. 2007), and recently collected data indicates the Tehachapi Mountains region was first significantly occupied during the Middle Horizon (W & S Consultants 2006). A parallel can be drawn to the inland Ventura County region where a similar pattern has been identified (Whitley and Beaudry 1991), as well as the western Mojave Desert (Sutton 1988a, 1988b), the southern Sierra Nevada (W & S Consultants 1999), and the Coso Range region (Whitley et al. 1988). In all of these areas a major expansion in settlement, the establishment of large site complexes and an increase in the range of environments exploited appear to have occurred sometime roughly around 4,000 years ago. Although most efforts to explain this expansion have focused on local circumstances and events, it is increasingly apparent this was a major southern California-wide occurrence and any explanation must be sought at a larger level of analysis (Whitley 2000). Additionally, evidence from the Carrizo Plain suggests the origins of the tribelet level of political organization developed during this period (W & S Consultants 2004; Whitley et al. 2007). Whether this same demographic process holds for the southern San Joaquin Valley, including the study area, is yet to be determined.

The beginning of the *Late Horizon* is set variously at 1,500 and 800 YBP, with a growing archaeological consensus for the shorter chronology. Increasing evidence suggests the importance

of the Middle-Late Horizons transition (AD 800 to 1200) in the understanding of south-central California prehistory. This corresponds to the so-called Medieval Climatic Anomaly, followed by the Little Ice Age, and this general period of climatic instability extended to about A.D. 1860. It included major droughts matched by intermittent “mega-floods,” and resulted in demographic disturbances across much of the west (Jones et al. 1999). It is believed to have resulted in major population decline and abandonments across south-central California, involving as much as 90% of the interior populations in some regions, including the Carrizo Plain (Whitley et al. 2007). It is not clear whether site abandonment was accompanied by a true reduction in population or an agglomeration of the same numbers of peoples into fewer but larger villages in more favorable locations. Population along the Santa Barbara coast appears to have spiked at about the same time that it collapsed on the Carrizo Plain (ibid). Along Buena Vista Lake, in Kern County, population appears to have been increasingly concentrated towards the later end of the Medieval Climatic Anomaly (Culleton 2006), and population intensification also appears to have occurred in the well-watered Tehachapi Mountains during this same period (W & S Consultants 2006).

What is then clear is that Middle Period villages and settlements were widely dispersed across the south-central California landscape, including in the Sierras and the Mojave Desert. Many of these sites are found at locations that lack existing or known historical fresh water sources. Late Horizon sites, in contrast, are typically concentrated in areas where fresh water was available during the historical period, if not currently.

One extensively studied site that shows evidence of intensive occupation during the Middle-Late Horizons transition (~1,500 – 500 YBP) is the Redtfeldt Mound (CA-KIN-66/H), located northwest of the current study area, near the north shore of ancient Tulare Lake. There, Siefkin (1999) reported on human burials and a host of artifacts and ecofacts excavated from a modest-sized mound. He found that both Middle Horizon and Middle-Late Horizons transition occupations were more intensive than Late Horizon occupations, which were sporadic and less intensive (Siefkin 1999:110-111).

The Late Horizon can then be understood as a period of recovery from a major demographic collapse. One result is the development of regional archaeological cultures as the precursors to ethnographic Native California; suggesting that ethnographic life-ways recorded by anthropologists extend roughly 800 years into the past.

The position of southern San Joaquin Valley prehistory relative to patterns seen in surrounding areas is still somewhat unknown. The presence of large lake systems in the valley bottoms appears to have mediated some of the desiccation seen elsewhere. But, as the reconstruction of Soda Lake in the nearby Carrizo Plain demonstrates (see Whitley et al. 2007) environmental perturbations had serious impacts on lake systems too. Identifying certain of the prehistoric demographic trends for the southern San Joaquin Valley, and determining how these trends (if present) correlate with those seen elsewhere, is a current important research objective.

2.4 HISTORICAL BACKGROUND

Spanish explorers first visited the San Joaquin Valley in 1772, but its lengthy distance from the missions and presidios along the Pacific Coast delayed permanent settlement for many years,

including during the Mexican period of control over the Californian region. In the 1840s, Mexican rancho owners along the Pacific Coast allowed their cattle to wander and graze in the San Joaquin Valley (JRP Historical Consulting 2009). The Mexican government granted the first ranchos in the southern part of the San Joaquin Valley in the early 1840s, but these did not result in permanent settlement. It was not until the annexation of California in 1848 that the exploitation of the southern San Joaquin Valley began (Pacific Legacy 2006).

The discovery of gold in northern California in 1848 resulted in a dramatic increase of population, consisting in good part of fortune seekers and gold miners, who began to scour other parts of the state. After 1851, when gold was discovered in the Sierra Nevada Mountains in eastern Kern County, the population of the area grew rapidly. Some new immigrants began ranching in the San Joaquin Valley to supply the miners and mining towns. Ranchers grazed cattle and sheep, and farmers dry-farmed or used limited irrigation to grow grain crops, leading to the creation of small agricultural communities throughout the valley (JRP Historical Consulting 2009).

After the American annexation of California, the southern San Joaquin Valley became significant as a center of food production for this new influx of people in California. The expansive unfenced and principally public foothill spaces were well suited for grazing both sheep and cattle (Boyd 1997). As the Sierra Nevada gold rush presented extensive financial opportunities, ranchers introduced new breeds of livestock, consisting of cattle, sheep and pig (Boyd 1997).

With the increase of ranching in the southern San Joaquin came the dramatic change in the landscape, as non-native grasses more beneficial for grazing and pasture replaced native flora (Preston 1981). After the passing of the Arkansas Act in 1850, efforts were made to reclaim small tracts of land in order to create more usable spaces for ranching. Eventually, as farming supplanted ranching as a more profitable enterprise, large tracts of land began to be reclaimed for agricultural use, aided in part by the extension of the railroad in the 1870s (Pacific Legacy 2006).

Following the passage of state wide ‘No-Fence’ laws in 1874, ranching practices began to decline, while farming expanded in the San Joaquin Valley in both large land holdings and smaller, subdivided properties. As the farming population grew, so did the demand for irrigation. Settlers began reclamation of swampland in 1866, and built small dams across the Kern River to divert water into the fields. By 1880, 86 different groups were taking water from the Kern River. Ten years later, 15 major canals provided water to thousands of acres in Kern County.

During the period of reclaiming unproductive land in the southern San Joaquin Valley, grants were given to individuals who had both the resources and the finances to undertake the operation alone. One small agricultural settlement, founded by Colonel Thomas Baker in 1861 after procuring one such grant, took advantage of reclaimed swampland along the Kern River. This settlement became the City of Bakersfield in 1869, and quickly became the center of activity in the southern San Joaquin Valley, and in the newly formed Kern County. Located on the main stage road through the San Joaquin Valley, the town became a primary market and transportation hub for stock and crops, as well as a popular stopping point for travelers on the Los Angeles and Stockton Road. The Southern Pacific Railroad reached the Bakersfield area in 1873, connecting it with important market towns elsewhere in the state, dramatically impacting both agriculture and oil production (Pacific Legacy 2006). According to General Land Office records, the Southern Pacific Railroad

patented its route north of Bakersfield, through the Richgrove area, between 1874 and 1877. The railroad apparently was constructed a few years prior.

Three competing partnerships developed during this period which had a great impact on control of water, land reclamation and ultimately agricultural development in the San Joaquin Valley: Livermore and Chester, Haggin and Carr, and Miller and Lux, perhaps the most famous of the enterprises. Livermore and Chester were responsible, among other things, for developing the large Hollister plow (three feet wide by two feet deep), pulled by a 40-mule team, which was used for ditch digging. Haggin and Carr were largely responsible for reclaiming the beds of the Buena Vista and Kern lakes, and for creating the Calloway Canal, which drained through the Rosedale area in Bakersfield to Goose Lake (Morgan 1914). Miller and Lux ultimately became one of the biggest private property holders in the country, controlling the rights to over 22,000 square miles. Miller and Lux's impact extended beyond Kern County, however. They recognized early-on that control of water would have important economic implications, and they played a major role in the water development of the state. They controlled, for example, over 100 miles of the San Joaquin River with the San Joaquin and Kings River Canal and Irrigation System. They were also embroiled for many years in litigation against Haggin and Carr over control of the water rights to the Kern River. Descendants of Henry Miller continue to play a major role in California water rights, with his great grandson, George Nickel, Jr., the first to develop the concept of water banking, thus creating a system to buy and sell water (<http://exiledonline.com/california-class-war-history-meet-the-oligarch-family-thats-been-scamming-taxpayers-for-150-years-and-counting/>).

Numerous private irrigation systems were initially developed by individuals. The Wright Act of 1887, however, allowed the creation of public irrigation districts, greatly facilitating the funding and construction of water conveyance systems. With increasing demand, the Central Valley Project (CVP) was developed to supply water to Fresno, Tulare and Kern counties. Friant Dam, which created Millerton Lake, was completed in 1942 and supplies water for the Friant-Kern and Madera Canals. The Friant-Kern Canal was constructed between 1945 and 1951 and is approximately 152 miles in length.

The AEWS D was organized in 1942 under the California Water Storage District law (Division 14 of the California Water Code), partly in anticipation of the CVP. AEWS D obtained a contract with Reclamation for CVP water in 1962 and, from 1964 – 1968, water distribution facilities were constructed. The Cross Valley Canal was constructed in 1974, with the Tejon Spreading Basin built in 1972 and the North Canal Spreading Basin in 1999. In 1997, AEWS D entered into a 25-year water management program with Metropolitan Water District of Southern California (MWD). As of 2003, AEWS D operated 72 production wells, and provided irrigation water to 52,000-ac, or 50% of all cropped acreage in its service area. Landowners additionally own and operate about 350 active private wells within the district's service area (AEWS D 2003). The focus of the current Project is 51 of those private wells. These are not directly connected to the AEWS D water conveyance and storage system but instead extract groundwater from the underlying basin.

2.5 RESEARCH DESIGN

2.5.1 Pre-Contact Archaeology

Previous research and the nature of the pre-contact archaeological record suggest two significant NRHP themes, both of which fall under the general Pre-Contact Archaeology area of significance. These are the Expansion of Pre-Contact Populations and Their Adaptation to New Environments; and Adaptation to Changing Environmental Conditions.

The Expansion of Pre-Contact Populations and Their Adaptation to New Environments theme primarily concerns the Middle Horizon/Holocene Maximum. Its period of significance runs from about 4,000 to 1,500 YBP. It involves a period during which the prehistoric population appears to have expanded into a variety of new regions, developing new adaptive strategies in the process.

The Adaptation to Changing Environmental Conditions theme is partly related to the Holocene Maximum, but especially to the Medieval Climatic Anomaly. The period of significance for this theme, accordingly, extends from about 4,000 to 800 YBP. This theme involves the apparent collapse of many inland populations, presumably with population movements to better environments such as the coast. It is not yet known whether the southern San Joaquin Valley, with its system of lakes, sloughs and swamps, experienced population decline or, more likely, population increase due to the relatively favorable conditions of this region during this period of environmental stress.

The range of site types that are present in this region include:

- Villages, primarily located on or near permanent water sources, occupied by large groups during the winter aggregation season;
- Seasonal camps, again typically located at water sources, occupied during other parts of the year tied to locally and seasonally available food sources;
- Special activity areas, especially plant processing locations containing bedrock mortars (BRMs), commonly (though not exclusively) near existing oak woodlands, and invariably at bedrock outcrops or exposed boulders;
- Stone quarries and tool workshops, occurring in two general contexts: at or below naturally occurring chert exposures on the eastern front of the Temblor Range; and at quartzite cobble exposures, often on hills or ridges;
- Ritual sites, most commonly pictographs (rock art) found at rockshelters or large exposed boulders, and cemeteries, both commonly associated with villages; and
- A variety of small lithic scatters (low density surface scatters of stone tools).

The first requisites in any research design are the definition of site age/chronology and site function. The ability to determine either of these basic kinds of information may vary between survey and test excavation projects, and due to the nature of the sites themselves. BRM sites without associated artifacts, for example, may not be datable beyond the assumption that they post-date the Early Horizon and are thus less than roughly 4,000 years old.

A second fundamental issue involves the place of site in the settlement system, especially with respect to water sources. Because the locations of the water sources have sometimes changed over time, villages and camps are not exclusively associated with existing (or known historical) water sources (W&S Consultants 2006). The size and locations of the region's lakes, sloughs and delta channels, to cite the most obvious example, changed significantly during the last 12,000 years due to major paleoclimatic shifts. This altered the area's hydrology and thus prehistoric settlement patterns. The western shoreline of Tulare Lake was relatively stable, because it abutted the Kettleman Hills. But the northern, southern and eastern shorelines comprised the near-flat valley floor. Relatively minor fluctuations up or down in the lake level resulted in very significant changes in the areal expression of the lake on these three sides, and therefore the locations of villages and camps. Although perhaps not as systematic, similar changes occurred with respect to stream channels and sloughs, and potential site locations associated with them. This circumstance has implications for predicting site locations and archaeological sensitivity. Site sensitivity is then hardest to predict in the open valley floor, where changes in stream courses and lake levels occurred on numerous occasions.

Nonetheless, the position of southern San Joaquin Valley prehistory relative to the changing settlement and demographic patterns seen in surrounding areas is still somewhat unknown (cf. Siefkin 1999), including to the two NRHP themes identified above. The presence of large lake systems in the valley bottoms can be expected to have mediated some of the effects of desiccation seen elsewhere. But, as the reconstruction of Soda Lake in the nearby Carrizo Plain demonstrates (see Whitley et al. 2007), environmental perturbations had serious impacts on lake systems too. Identifying certain of the prehistoric demographic trends for the southern San Joaquin Valley, and determining how these trends (if present) correlate with those seen elsewhere, is another primary regional research objective.

Archaeological sites would primarily be evaluated for NRHP eligibility under Criterion D, research potential.

2.5.2 Historical Archaeology: Native American

Less research has been conducted on the regional historical archaeological record, both Native American and Euro-American. For Native American historical sites, the ethnographic and ethnohistoric periods in the southern San Joaquin Valley extended from first Euro-American contact, in AD 1772, to circa 1900, when tribal populations were first consolidated on reservations. The major significant historic NRHP themes during this period of significance involve the related topics of Historic-Aboriginal Archaeology, and Native American Ethnic Heritage. More specifically, these concern the Adaptation of the Indigenous Population to Euro-American Encroachment and Settlement, and their Acculturation to Western Society. These processes included the impact of missionization on the San Joaquin Valley (circa 1800 to about 1845); the introduction of the horse and the development of a San Joaquin Valley "horse culture," including raiding onto the coast and Los Angeles Basin (after about 1810); the use of the region as a refuge for mission neophyte escapees (after 1820); responses to epidemics from introduced diseases (especially in the 1830s); armed resistance to Euro-American encroachment (in the 1840s and early 1850s); the origins of the reservation system and the development of new tribal organizations and

ethnic identities; and, ultimately, the adoption of the Euro-American society's economic system and subsistence practices, and acculturation into that society.

Site types that have been identified in the region dating to the ethnographic/ethnohistoric period of significance primarily include villages and habitations, some of which contain cemeteries and rock art (including pictographs and cupules). Dispersed farmsteads, dating specifically from the reservation period or post-1853, would also be expected. The different social processes associated with this historical theme may be manifest in the material cultural record in terms of changing settlement patterns and village organization (from traditional nucleated villages to single family dispersed farmsteads); the breakdown of traditional trading networks with their replacement by new economic relationships; changing subsistence practices, especially the introduction of agriculture initially via escaped mission neophytes; the use of Euro-American artifacts and materials rather than traditional tools and materials; and, possibly, changing mortuary practices.

Inasmuch as culture change is a primary intellectual interest in archaeology, ethnographic villages and habitations may be NRHP eligible under Criterion D, research potential. Rock art sites, especially pictographs, may be eligible under Criterion C as examples of artistic mastery. They may also be eligible under Criterion A, association with events contributing to broad patterns of history. Ethnographic sites, further, may be NRHP eligible as Traditional Cultural Properties due to potential continued connections to tribal descendants, and their resulting importance in traditional practices and beliefs, including their significance for historical memory, tribal- and self-identity formation, and tribal education.

For Criteria A, C and D, eligibility requires site integrity (including the ability to convey historical association for Criterion A). These may include intact archaeological deposits for Criterion D, as well as setting and feel for Criteria C and A. Historical properties may lack physical integrity, as normally understood in heritage management, but still retain their significance to Native American tribes as Traditional Cultural Properties if they retain their tribal associations and uses.

2.5.3 Historical Archaeology: Euro-American

Approaches to historical Euro-American archaeological research relevant to the region have been summarized by Caltrans (1999, 2000, 2007, 2008). These concern the general topics of historical landscapes, agriculture and farming, irrigation (water conveyance systems), and mining. Caltrans has also identified an evaluation matrix aiding determinations of eligibility. The identified research issues include site structure and land-use (lay-out, land use, feature function); economics (self-sufficiency, consumer behavior, wealth indicators); technology and science (innovations, methods); ethnicity and cultural diversity (religion, race); household composition and lifeways (gender, children); and labor relations. Principles useful for determining the research potential of an individual site or feature are conceptualized in terms of the mnemonic AIMS-R, as follows:

1. *Association* refers to the ability to link an assemblage of artifacts, ecofacts, and other cultural remains with an individual household, an ethnic or socioeconomic group, or a specific activity or property use.

2. *Integrity* addresses the physical condition of the deposit, referring to the intact nature of the archaeological remains. In order for a feature to be most useful, it should be in much the same state as when it was deposited. However, even disturbed deposits can yield important information (e.g., a tightly dated deposit with an unequivocal association).

3. *Materials* refers to the number and variety of artifacts present. Large assemblages provide more secure interpretations as there are more datable items to determine when the deposit was made, and the collection will be more representative of the household, or activity. Likewise, the interpretive potential of a deposit is generally increased with the diversity of its contents, although the lack of diversity in certain assemblages also may signal important behavioral or consumer patterns.

4. *Stratigraphy* refers to the vertically or horizontally discrete depositional units that are distinguishable. Remains from an archaeological feature with a complex stratigraphic sequence representative of several events over time can have the added advantage of providing an independent chronological check on artifact diagnosis and the interpretation of the sequence of environmental or sociocultural events.

5. *Rarity* refers to remains linked to household types or activities that are uncommon. Because they are scarce, they may have importance even in cases where they otherwise fail to meet other thresholds of importance (Caltrans 2007:209).

For agricultural sites, Caltrans (2007) has identified six themes to guide research: Site Structure and Land Use Pattern; Economic Strategies; Ethnicity and Cultural Adaptation; Agricultural Technology and Science; Household Composition and Lifeways; and Labor History. Expected site types would include farm and ranch homesteads and facilities, line camps, and refuse dumps. In general terms, historical Euro-American archaeological sites would be evaluated for NRHP eligibility under Criterion D, research potential. However, they also potentially could be eligible under Criteria A and B for their associate values with major historical trends or individuals. Historical landscapes might also be considered.

Historical structures, in contrast are typically evaluated for NRHP eligibility under Criteria A and/or B, for their associated values with major historical trends or individuals, and C for potential design or engineering importance.

Water conveyance systems comprise a particular sub-set of historical structures that warrant discussion in light of the known presence of such resources within the Project study area.

2.5.4 Significant Themes

Water conveyance systems within the Project study area can be evaluated in terms of two NRHP themes, as follows.

Theme 1: Development of Irrigated Agriculture in the San Joaquin Valley, 1852-1968

As identified by Caltrans in the *Water Conveyance Systems in California Historic Context Development and Evaluation Procedures*, the “Development of Irrigated Agriculture” is a historically significant theme or event in the history of California and the Central Valley region. In the years following California’s statehood and the gold rush, increasing population created an growing market for agricultural products. The total irrigated acreage in the state grew from 60,000 acres in 1860 to nearly 400,000 acres by 1880, an increase of more than 650 percent, and the San Joaquin Valley contained the highest percentage of that land (approximately 47 percent) (Caltrans 2000). Private water companies, land colonies, mutual water companies, and irrigation districts were established in the mid- to late nineteenth century to build irrigation systems to further develop the state’s agriculture industry. Irrigation districts became the most influential of these organizations, especially after state legislation—the Wright Act of 1887—causing irrigation districts to grow in number, power, as well as the actual amount of irrigated land throughout the state. Forty-nine irrigation districts were organized between 1887 and 1896, most of them located between Stockton and Bakersfield. However, by the late 1920s, only seven of the original districts were still in existence, among them the Modesto, Turlock, and Tulare irrigation districts (Caltrans 2000). Under the impetus of increased demand during World War I, agricultural production reached a new peak in 1920. Companies like Pacific Gas & Electric and San Joaquin Valley Light and Power helped finance large irrigation reservoirs to feed district canals in return for the power generated. By 1930, there were 94 active districts in California, and the land watered by these agencies mushroomed to 1.6 million acres (Caltrans 2000). Irrigation districts provided more than 90 percent of the surface water used for irrigation in the San Joaquin Valley before the Central Valley Project came on line in the 1940s (Caltrans 2000). Most were located in the San Joaquin Valley, with the most successful in Modesto, Turlock, Merced, and Fresno.

The period of significance for this theme begins with the earliest developments of irrigated agriculture in the San Joaquin Valley, with the construction of the earliest earthen ditches in Visalia in 1852. Irrigated agriculture continues to be an important industry and influence in the Valley. The period of significance ends in 1968 following recommended guidance for closing a period of significance 50 years ago when activities continued to have importance, but no more specific date can be defined to end the historic period, and there is no justification for exceptional significance to extend the period of significance to an end date within the last 50 years (National Register of Historic Places 1997).

Associated Property Types:

Water Conveyance Systems

Following the framework established by Caltrans in *Water Conveyance Systems in California Historic Context Development and Evaluation Procedures*, the water conveyance system is the property type that has the potential to reflect this theme and period. Components and features of water conveyance systems include diversion structures, conduits, flow control devices, cleansing devices, and associated resources and settings. Water Conveyance Systems that are associated with Development of Irrigated Agriculture in the San Joaquin Valley, 1852-1968 will be eligible under NRHP Criterion A/CRHR Criterion 1 for their association with this significant theme if:

- the association with the theme is important--simply because a water conveyance existed during the period of significant is not enough for that system to be eligible;

- the resource retains high overall integrity. The property should retain most of the seven aspects of integrity: location, design, setting, materials, workmanship, feeling, and association.
- Due to the nature of this type of resource, repairs and modifications are acceptable but not if those modifications substantially modified the resource.

Water Conveyance Systems that are associated with Development of Irrigated Agriculture in the San Joaquin Valley, 1852-1968 will be eligible under NRHP Criterion B/CRHR Criterion 2 for their association with this significant theme if they are:

- associated with an important person's productive life **and** they are the property that is most closely associated with that person;
- the resource retains high overall. The property should retain most of the seven aspects of integrity: location, design, setting, materials, workmanship, feeling, and association.
- Due to the nature of this type of resource, repairs and modifications are acceptable but not if those modifications substantially modified the resource.

Water conveyance systems will rarely be found eligible under Criterion B. In California notable names for which there might be associations with water planning, construction, or engineering include: Anthony Chabot, George Chaffey, Frederick Eaton, William Mulholland, George Maxwell, Robert Marshall, Elwood Mead and C. E. Grunsky (Caltrans 2000).

Theme 2: Technological Innovation in Irrigated Agriculture in California, 1852-1964

Caltrans clearly defines the historic context for this theme in the “Legacy of Irrigation Canals” section of the context, while ASM has defined a period of significance based on the Caltrans context (Caltrans 2000). The following is a direct excerpt from the context:

“The earliest irrigation water conveyances in California were roughly made, earthen ditches to divert water. Techniques used to construct irrigation canals have varied widely during the various periods of California’s history, from the relatively short, hand-dug, early masonry and tile ditches, to horse-scraped and hand-dug earthen irrigation ditches, to the large concrete-lined, machine-formed irrigation canals of the middle decades of the twentieth century. Evidence of these changes in scale, methods of construction, and knowledge of engineering are reflected in the remaining physical resources found on the landscape today. Substantial regional variation exists with respect to the adoption and dissemination of the new technologies, such as where and when concrete replaced wood in the engineering works of major irrigation canals. These regional differences can be explained in part by cultural traditions with respect to water management, ownership of water rights, and environmental factors, but economics, politics, and the formation of particular types of irrigation institutions also played a significant role.

“Older canals were often subject to substantial change over time. A common change was to expand the system in order to serve more acreage. Unless pumps are used, irrigation canals rely on gravity to move water, and they can provide service only to land lying below the canal’s water level. As irrigated acreage expanded, water companies frequently

consolidated smaller ditch systems, moved the point of diversion upstream, and built a high-line canal to service new acreage. In this manner, pioneer canals were often absorbed into larger systems, frequently by irrigation districts, to pull in more potentially irrigable lands. Segments of earlier irrigation systems might remain largely intact within the larger framework of a new irrigation system, or the changes could be such that the old separate irrigation system would become, in essence, a typical component of a new 1920s irrigation district canal.

“Another important factor is that water is notoriously difficult to control; it can be, and frequently is, an engine of destruction. Flood waters, for example, repeatedly overwhelmed the flimsy wooden control structures built on nineteenth and early-twentieth century irrigation systems in the San Joaquin Valley. Canals required periodic maintenance and were also often altered as a result of improvements designed to counteract the normal erosion that occurs from water moving through earth-lined canals. Improvements to stabilize canals ranged from realigning segments of the channel, to lining ditches or putting them in pipe, to replacement of checks, drops, culverts, or other regulation structures. These improvements were sometimes carried out system-wide, sometimes on a piecemeal basis. In light of the proclivity for change and the wide diversity of canal materials and modes of construction, adequate documentary research is essential to understand the evolution of an important irrigation canal and to assess its integrity” (Caltrans 2000).

The period of significance for this theme begins with the earliest developments of irrigated agriculture in the San Joaquin Valley, with the construction of the earliest earthen ditches in Visalia in 1852. Technological innovations in agricultural irrigation are ongoing, but the period of significance ends in 1968 following recommended guidance for closing a period of significance 50 years ago when activities continued to have importance, but no more specific date can be defined to end the historic period, and there is no justification for exceptional significance to extend the period of significance to an end date within the last 50 years (National Register of Historic Places 1997).

Associated Property Types:

Water Conveyance Systems

Following the framework established by Caltrans in *Water Conveyance Systems in California Historic Context Development and Evaluation Procedures*, the water conveyance system is the property type that has the potential to reflect this theme and period. Components and features of water conveyance systems include diversion structures, conduits, flow control devices, cleansing devices, and associated resources and settings. Water Conveyance Systems that are associated with Technological Innovation in Irrigated Agriculture in California, 1852-1968 will be eligible under NRHP Criterion C/CRHR Criterion 3 for their association with this significant theme if they are/have:

- unique values;
- the best or good example of the property type as one that possess distinctive characteristics of the type and through those characteristics clearly illustrates at least one of the following;

- the pattern of features common to a particular class of resources
 - the individuality or variation of features that occurs within the class;
 - the evolution of that class; or
 - the transition between classes of resources
- the earliest, best preserved, largest, or sole surviving example of particular types of water conveyance systems;
- a design innovation of evolutionary trends in engineering
- designed by a figure of acknowledged greatness in the field or by someone unknown whose workmanship is distinguishable from others by its style and quality **and** be a good example of that designer's work;
- the resource retains high overall integrity because of the high number of comparable examples. The property should retain most of the seven aspects of integrity: location, design, setting, materials, workmanship, feeling, and association.

A large water conveyance system with multiple components will often be evaluated as a district rather than as a single property. An eligible historic district must possess a significant concentration or linkage of resources that are united historically or aesthetically by plan or physical development. It should be a significant and distinguishable entity, although its components need not possess individual distinction (Caltrans 2000).

Page is intentionally blank

3. ARCHIVAL RECORDS SEARCH

3.1 ARCHIVAL RECORDS SEARCH

In order to determine whether the study area had been previously surveyed for cultural resources, and/or whether any such resources were known to exist within or near to it, an archival records search was conducted by the staff of the Southern San Joaquin Valley Information Center (IC) on 10 August 2020. The records search was completed to determine: (i) if prehistoric or historical archaeological sites had previously been recorded within the study areas; (ii) if the project area had been systematically surveyed by archaeologists prior to the initiation of this field study; and/or (iii) whether the region of the field project was known to contain archaeological sites and to thereby be archaeologically sensitive. Records examined included archaeological site files and maps, the NRHP, Historic Property Data File, California Inventory of Historic Resources, and the California Points of Historic Interest. The records search included the study area and a half-mile buffer.

According to the IC records (Confidential Appendix B), 19 previous archaeological surveys had been completed that covered portions of the study area (Table 1). An additional 25 previous archaeological surveys had been conducted within 0.5-mi of the study area (Table 2). The records search indicates that 6 archaeological resources, all Euro-American historical sites or structures, are known to exist within the study area (Table 3), with an additional 22 archaeological resources within a 0.5-mi radius (Table 4).

In addition to the records search, a Sacred Lands File Request was completed by the Native American Heritage Commission (NAHC). No specific concerns were identified as a result of the request. Outreach letters were sent and follow-up emails or phone calls were made to tribal organization on the NAHC contact list. No information on tribal cultural resources or expressions of concern were received from any of the tribes. Results of the records search and tribal contacts are presented in Confidential Appendix B.

Table 1 Survey Reports Within the Study Area.

Report No	Year	Author (s)/Affiliation	Title
KE-00254	1990	Clay, Vickie L. and Hause, Larry L./ Archaeological Research Services, Inc.	An Archaeological Inventory of the Proposed PG&E Pipeline Corridor Segments: Newberry Springs to Hinkley 29.6 MI by 200 FT (717.6 AC), Kern County, California
KE-00440	1991	Glover, Leslie G./ Far Western Anthropological Research Group, Inc.	A cultural resources inventory of selected route re-alignments for the Mojave Pipeline in California and Arizona
KE-00633	1993	Macko, Michael E., Binning, Jeanne D., Earle, David D., and Langenwaller, Paul E./ Macko Archaeological Consulting	National Register Eligibility Determinations for Historic Resources Along the Proposed AT&T Lightguide System, Victorville to Bakersfield, California
KE-01025	1996	Roper, Kristina C. and Moratto, Michael J./ Applied EarthWorks, Inc.	Preliminary Cultural Resources Study for the Proposed MWD Water Transfer Facilities Project, Kern County, California
KE-01072	1979	Schiffman, Robert A.	Archaeological Investigation of the Proposed Wastewater Treatment Plant and Transmission Facility Modifications for the Arvin County Sanitation District

3. Archival Records Search

KE-01220	1986	Schiffman, Robert A./ Bakersfield College	Caliente Creek Stream Group Investigation, Kern County, California: Intensive Cultural Resources Survey and Evaluation
KE-02059	1997	Love, Bruce/ CRM TECH	Cultural Resources Survey Report: Bakersfield-Rialto Fiberoptic Line Project, Kern, Los Angeles, and San Bernardino Counties, California
KE-02306	1999	Wren, Donald G.	An Archaeological Survey of the Edison Creek Flood Restoration Project, Kern County, CA
KE-02371	1999	Wren, Donald G.	An Archaeological Survey of the Tejon Creek Channel Restoration Project, Kern County, California
KE-02450	1999	Hudlow, Scott M./ California Department of Transportation	Negative Archaeological Survey Report: Reconstruction on Panama Road Between S. "H" Street and Comanche Road, County of Kern Roads Department
KE-02601	2001	Simon J./ W & S Consultants	Phase I Archaeological Survey of the Caliente Creek Energy Park, Kern County, CA
KE-03229	2005	Schiffman, Robert A. and Gold, Alan P./ Archaeological Associates of Kern County	Cultural Resource Survey for a 180-Acre Parcel Between El Camino West and Millix Avenue in Arvin, Kern County, California
KE-04021	2010	Romani, John F./ Compass Rose Archaeological, Inc.	Archaeological Survey Report Improvements to Wheeler Ridge Road from David Road North to State Route 223 (Approximately 8 miles), Kern County, California
KE-04293	2011	Holm, Lisa and Jackson, Thomas L./ Pacific Legacy	Archaeological Survey Report for the Regulus Solar Project, Kern County, California
KE-04875	2015	Asselin, Katie and Lloyd, Jay B./ Applied EarthWorks, Inc.	Cultural Resources Inventory for the Arvin-Edison Water Storage District Drought Solicitation Improvement Grant Project, Kern County, California
KE-04957	2015	Smallwood, Josh, Asselin, Katie, and Lloyd, Jay B./ Applied EarthWorks, Inc.	Cultural Resources Survey and Evaluation for the Arvin-Edison Water Storage District Water Conservation and Efficiency Project, Kern County, California
KE-04959	2016	Brunzell, David/ BCR Consulting LLC	Phase I Cultural Resources Assessment and Extended Phase I Subsurface Testing, Sonshine Water System Consolidation Project, Kern County, California
KE-05040	2018	Brunzell, David/ BCR Consulting LLC	Phase I Cultural Resources Assessment and Extended Phase I Subsurface Testing Arsenic Mitigation Project
KE-05149	2019	Whitley, David S., Azpitarte, Robert, and Escamilla, Stacey/ ASM Affiliates, Inc.	Class III Inventory/Phase I Survey, Arvin-Edison Water Storage District Water Metering Project, Kern County, California

Table 2 Survey Reports within 0.5-Miles of the Study Area.

Report No	Year	Author (s)/Affiliation	Title
KE-00579	1982	Levulett, Valerie A./ California Department of Transportation	Archaeological Survey Report for a Proposed Channel Revision and Roadbed Raising 06-KER-223, PM 22.9/23.4, 06305-225900
KE-00753	1982	O'Connor, Denise/ California Department of Transportation	Archaeological Survey Report for a Proposed Left Turn Channelization at Hermosa Road 06-KER-184, PM 5.06
KE-01416	1991	Schiffman, Robert A./ Bakersfield College	Archaeological Investigation of 40 Acre Parcel Near Arvin Section 36, T. 31S, R.29E. Kern County, California
KE-01973	1997	Roper, C. Kristina/ Sierra Valley Cultural Planning	A Cultural Resources Inventory for the Proposed City of Arvin Sewer Treatment Plant Expansion, Kern County, California
KE-01989	1995	California Department of Transportation	Historic Property Survey Report: Rehabilitate Route 184 In and Near Lamont, Kern County
KE-01989A	1994	Osborne, Richard H. and Riley, Lynn M./ California Department of Transportation	Negative Archaeological Survey Report for Highway 184 Expansion
KE-01989B	1995	Clement, Dorene/ California Department of Transportation	Historic Architectural Survey Report for Improvements On State Route 184 In Lamont, Kern County

Report No	Year	Author (s)/Affiliation	Title
KE-02161	1997	Chamberlin, Christine/ Laboratory of Anthropology, CSU Fresno	Archaeological Survey Report for the Proposed Rehabilitation of Route 223, Kern County, CA
KE-02161A	1998	Riley, Lynn/ Cal Trans	Historic Property Survey Report - Negative Findings - for the Proposed Rehabilitation of Route 223, Kern County, California
KE-02221	1998	Hudlow, Scott M./ Hudlow Cultural Resource Associates	A Phase I Cultural Resource Survey for CD Activity 29.96.2, Lamont Sump/Drain Field, Kern County, California
KE-02418	2000	Hudlow, Scott M./ Hudlow Cultural Resource Associates	Letter Report: An Archaeological Survey of the Wheeler Ridge Road and Sandrini Road Intersection
KE-02454	2000	Duke, Curt/ LSA Associates, Inc.	Cultural Resource Assessment for Pacific Bell Wireless Facility VY 004-01, Kern County, California
KE-02548	2001	Lloyd, John (Jay) and Flint, Sandra S./ Applied EarthWorks, Inc.	Archaeological Survey for the Cornell Southwest Corrections Facility Project, Arvin, Kern County, California
KE-02603	2000	Collett, Tom/ Terracon	Indian Religious Site and American Historical Site Determination: Proposed Cellular Communications Tower 10230 S. Vineland Road
KE-02655	2001	Billat, Lorna/ earthTouch, LLC.	Nextel Communications (Build Out) CA-1933A/Lamont 10230 South Vineland Road
KE-03101	2005	Fleagle, Dorothy/ Three Girls and a Shovel	A Cultural Resources Assessment for 30.5 Acres South of Varsity Road, East of North Hill Street and West of Historic Tejon Highway, In Arvin, Kern County, California
KE-03262	2006	Fleagle, Dorothy/ Three Girls and a Shovel	A Cultural Resources Assessment for 80.34 Acres South of Arvin, Kern County, California
KE-03726	2005	Flint, Sandra S., McDougall, Dennis P., Jernigan, Kathleen, and Anderson, Lisa/ Applied EarthWorks, Inc.	Cultural Resources Surveys for the Kern Delta Water District Water Banking and In-Lieu Water Supply Project, Kern County, California
KE-03777	2010	Palm-Leach, Laura, Brandy, Paul, King, Jay, Mikkelsen, Pat, Seil, Libby, Hartman, Lindsay, Bradeen, Jill, Larson, Bryan, Freeman, Joseph, Costello, Julia, Rosenthal, Jeffrey, and Jones, Deborah/ Far Western Anthropological Research Group, Inc.	Cultural Resources Inventory of Caltrans District 6 Rural Conventional Highways in Fresno, Western Kern, Kings, Madera, and Tulare Counties Summary of Methods and Findings
KE-03893	2008	Romani, John F./ Compass Rose Archaeological, Inc.	Archaeological Survey Report Wheeler Ridge Road from David Road South to Interstate 5 at Laval Road, Kern County, California
KE-04082	2011	Glentis, Dionisios/ Southern California Edison Company, Rosemead, CA	Archaeological Survey Report for Souther California Edison Company's Corroded Transmission Tower Footing Rehabilitation Program on the Antelope-Magunden #2 220 kV and Springville-Magunden #1 220 kV Transmission Circuits, Bakersfield, Kern County, California (WO SAP800366774 and SAP900268662)
KE-04269	2011	Hudlow, Scott/ Hudlow Cultural Resource Associates	A Phase I Cultural Resource Survey for Arvin Plastic Recycling Facility, City of Arvin, California
KE-04342	2011	Mason, Roger D. and Jones, Wendy/ ECORP Consulting, Inc.	Cultural Resources Survey Report for the FRV Orion Solar Project Near Arvin, Kern County, California
KE-04480	2011	Perez, Don C./ EBI Consulting	Archaeological Assessment for Prior Disturbance Arvin / LAB519A 14141 Di Giorgio Road, Arvin, Kern County, California
KE-04507	2014	Harvey, Victoria/ Cogstone Resource Management	Cultural Resources Records Search and Site Visit for Mountain View CA-CLV0632, ATC Site No. 280736 - 11200 Mountain View Road, Bakersfield, CA 93307
KE-04618	2014	Monastero, Andrew P., Lloyd, Jay B., and Armstrong, Matthew D./ Applied EarthWorks, Inc.	Cultural Resource Studies for the Redwood Cluster Solar Project, Kern County, California
KE-04618A	2014	Tinsley Becker, Wendy/ Urbana Preservation and Planning	Proposed Redwood Cluster Solar Project CEQA Historical Resource Survey, Kern County, California

3. Archival Records Search

Report No	Year	Author (s)/Affiliation	Title
KE-04646	2014	Brunzell, David/ BCR Consulting, LLC.	Phase I Cultural Resources Assessment and Extended Phase I Subsurface Testing for Two Proposed Well Sites of the Arsenic Mitigation Project, Kern County, California
KE-04833	2016	Foglia, Shannon and Cooley, Theodore/ AECOM	Cultural Resources Survey Report for the Proposed Southern California Edison Company's Antelope-Magunden No. 1 Transmission Line Rating Remediation Project, Kern County, California

Table 3 Resources within the Study Area.

Site No.	Type	Description
P-15-003545/ CA-KER-3545H	Site	Tejon Highway
P-15-007994	Structure	Arvin-Edison Canal
P-15-017243	Structure	Transmission lines
P-15-017582	Structure	Transmission Line
P-15-019115	Structure	Big Creek East & West Transmission Line (National Register – 16000468)
P-15-020334	Object	Well 23B

Table 4 Resources within 0.5-Miles of the Study Area.

Site No.	Type	Description
P-15-003546/ CA-KER-3546H	Structure	Muller Road
P-15-004742	Structure	Canal
P-15-007744	Object	Plaque commemorating outermost point in the South San Joaquin Valley
P-15-008090	Building	Building
P-15-013724/ CA-KER-7700H	Structure	East Side Canal
P-15-016834/ CA-KER-9261H	Site	Irrigation system remnants
P-15-018055	Site	Irrigation system remnants
P-15-018057	Site	Historic-era dwellings
P-15-018058	Site	Historic-era dwellings
P-15-018063	Site	Historic-era agricultural feature
P-15-020313	Object	Well 3C
P-15-020314	Object	Well 3D
P-15-020315	Object	Well 3F
P-15-020318	Object	Well 4C
P-15-020320	Object	Well 4E
P-15-020324	Object	Well 16G
P-15-020325	Site	Well 16H
P-15-020326	Object	Well 16I
P-15-020328	Object	Well 21A
P-15-020332	Object	Well 22B
P-15-020344	Object	Well 28C
P-15-020351	Object	Well 34B

Historical maps and aerials (accessed at <https://www.historicaerials.com/viewer> and at <https://geonames.usgs.gov/apex/f?p=262:1:6956172430705>) were consulted to determine approximately when well stations (and, in some cases, adjacent reservoirs) were first constructed (Table 5). Given that the study area is entirely within undeveloped agricultural lands, where developments of any kind would likely be depicted, these provided reasonable historical coverage of the study area.

Table 5. USGS Topographical Quadrangles Examined

USGS QUADRANGLE	YEAR (Including Revisions)
Arvin	1930,1933, 1955, 1970
Coal Oil Canyon	1934, 1950, 1955, 1970
Edison	1931, 1950, 1954, 1970
Lamont	1929, 1932, 1950, 1954, 1970
Mettler	1931, 1934, 1955, 1968
Tejon Hills	1931, 1933, 1955, 1968

Based on the records search results, the general study area appeared to have low archaeological and tribal cultural resources sensitivity.

Page is intentionally blank

4. METHODS AND RESULTS

4.1 FIELD METHODS

A Phase I survey of the 860-ac AEWS D Project study area was conducted in August and September 2020 by ASM Associate Archaeologist Robert Azpitarte, B.A., with assistance in the field from ASM Assistant Archaeologists Maria Silva, B.A., Margarita Lemus, B.A., and Stacey Escamilla, B.A. The field methods employed included intensive pedestrian examination of the study area ground surface for evidence of archaeological sites in the form of artifacts, surface features (such as bedrock mortars, historical mining equipment), and archaeological indicators (e.g., organically enriched midden soil, burnt animal bone); the identification and location of any discovered sites, should they be present; tabulation and recording of surface diagnostic artifacts; site sketch mapping; preliminary evaluation of site integrity; and site recording, following the California Office of Historic Preservation Instructions for Recording Historic Resources and the BLM 8100 Manual, using DPR 523 forms. Parallel survey transects spaced at 15-m apart were employed for the inventory.

4.2 SURVEY RESULTS

Six previously recorded cultural resources were re-identified and their site records updated during the Phase I survey. These resources are segments of Tejon Highway (P-15-003545), segments of the Arvin-Edison Canal (P-15-007994), a historic water well (P-15-020334), and segments of three transmission lines (P-15-017243, P-15-017582, and P-15-019115).

In addition to the previously recorded resources, three newly identified cultural resources (one site and two isolated finds) were identified and recorded during the Phase I survey. The newly recorded site was given the temporary designation AEWS D-RA-1. It consists of a segment of Tejon Creek. The newly recorded isolated finds were given the temporary designations AEWS D-ISO-1 and AEWS D-ISO-2. AEWS D-ISO-1 consists of a single lithic flake and AEWS D-ISO-2 consists of a single projectile point.

Site descriptions for the six previously recorded sites and the three newly recorded resources are presented below. Sketch maps and location maps for all resources, as well as all pictures of the resources, are available in the respective DPR forms for each resource in Confidential Appendix C. Original DPR forms for the previously recorded sites are available in Confidential Appendix D.

4.2.1 Previously Recorded Resources

P-15-003545 (Tejon Highway)

The resource consists of Tejon Highway, a paved road associated with a historic wagon road alignment. The Tejon Highway bisects the study area in three locations (Segment A, B, and C; Table 6). The resource is in good condition and currently in-use.

The Tejon Highway was initially recorded by Macko Archaeological Consulting in 1993 and last updated by AECOM in 2016. The resource remains as last described and consists of an improved two-lane asphalt road with no existing historic components.

Table 6. P-15-003545 Investigated Segments

Segment:	Location UTM's (center):	Approx. Dimensions:
Segment A	333915mE/3894525mN	50-ft (N/S) x 70-ft (E/W)
Segment B	333905mE/3893470mN	3,620-ft (N/S) x 70-ft (E/W)
Segment C	333905mE/3892130mN	50-ft (N/S) x 70-ft (E/W)

P-15-007994 (Arvin-Edison Canal)

The resource consists of the Arvin-Edison Canal, a historic irrigation canal constructed around the mid-20th century. The Arvin-Edison Canal bisects the study area in four locations (Segment A, B, C, and D; Table 7). The resource is in good condition and is currently in-use.

Other sections of the Arvin-Edison Canal have been recorded by Brewer's Historical Consultants in 1997 and by Applied EarthWorks in 2015. According to historical aerial photography, USGS Quadrangles, and Google Earth, the initial construction of the Arvin-Edison Canal occurred after 1952 with the canal completed in 1967 (AEWSD 1967). The canal currently holds water and canal depth was not observable at all locations. All recorded segments are similar in construction, consisting of concrete lined walls and bed with associated irrigation features that are contemporary in age.

Table 7. P-15-007994 Investigated Segments

Segment:	Location UTM's (center):	Approx. Dimensions:
Segment A	331135mE/3906685mN	100-ft (NW/SE) x 120-ft (E/W)
Segment B	334855mE/3900890mN	100-ft (NW/SE) x 85-ft (NE/SW)
Segment C	337970mE/3896895mN	1,165-ft (NNE/SSW) x 90-ft (E/W)
Segment D	330865mE/3889450mN	100-ft (NE/SW) x 85-ft (NW/SE)

The resource was recorded and evaluated for NRHP/CRHR eligibility in 2015 and recommended as not eligible under any of the four criteria (Smallwood et al. 2015:37-39).

P-15-017243 (Vincent Transmission Line)

The resource consists of an alternate corridor of the Big Creek Transmission Line, specifically, the Vincent Transmission Line, an early 20th century transmission corridor. The Vincent Transmission Line bisects the study area in three locations (Segment A, B, and C; Table 8). The resource is in good condition and is currently in-use.

Other sections of this alternate Big Creek corridor were initially recorded by Urbana Preservation and Planning in 2011. Construction of the Vincent Transmission Line was initiated in 1925 and completed in 1927, with subsequent improvements taking place. Two steel towers are situated within currently recorded Segment B.

Table 8. P-15-017243 Investigated Segments

Segment:	Location UTM's (center):	Approx. Dimensions:
Segment A	336115mE/3898940mN	115-ft long (NW/SE))
Segment B	336430mE/3898350mN	115-ft long (NW/SE))
Segment C	337330mE/3896680mN	115-ft long (NW/SE))

The Big Creek Hydroelectric System Historic District (BCHSHD) was listed on the National Register of Historic Places in 2016 (NR ID No. 16000468).

P-15-017582 (Magunden – Mesa Substation Transmission Line)

The resource consists of an alternate corridor of the Big Creek Transmission Line, specifically, the Magunden Substation – Mesa Substation Transmission Line, a mid-20th century transmission corridor. These alternate Big Creek Transmission Line corridors bisect the study area in three locations (Segment A, B, and C; Table 9). The resource is in good condition and currently in-use.

Other sections of this alternate Big Creek corridor were initially recorded by Urbana Preservation and Planning in 2011. Construction of the Magunden Substation - Mesa Substation Transmission Line was initiated in 1949 and completed in 1951, with subsequent improvements taking place. No towers are situated within the study area.

This resource is a contributing element to the BCHSHD.

Table 9. P-15-017582 Investigated Segments

Segment:	Location UTM's (center):	Approx. Dimensions:
Segment A	336115mE/3898940mN	115-ft long (NW/SE)
Segment B	336430mE/3898350mN	115-ft long (NW/SE)
Segment C	337330mE/3896680mN	115-ft long (NW/SE)

P-15-019115 (Big Creek East and West Transmission Line)

The resource consists of two segments of the Big Creek East and West Transmission Line corridor, an early 20th century transmission corridor. The Big Creek Transmission Line corridor bisects the study area in two locations (Segment A and B; Table 10). The resource is in good condition and currently in-use.

Sections of the Big Creek East & West Transmission Line in the region were initially recorded and evaluated by Southern California Edison in 2016, and were added to the National Register of Historic Places under Criterion A and C (Reference No. 16000468). The initial Big Creek East & West Transmission Line was constructed in 1912 and completed the next year, with subsequent improvements taking place. The transmission corridor is comprised of parallel transmission lines with metal towers. Three towers are located within the study area.

Table 10. P-15-019115 Investigated Segments

Segment:	Location UTM's (center):	Approx. Dimensions:
Segment A	326730mE/3889825mN	100-ft (NW/SE) x 65-ft (E/W)
Segment B	327235mE/3887540mN	1,080-ft (NW/SE) x 65-ft (ENE/WSW)

P-15-020334

The resource consists of a historic water well (Kirschmann Ent 189-050-65) dating to the mid-20th century. The well and associated features are in an area measuring 65-ft (north-south) by 65-ft (east-west). The resource is in good condition and currently in-use.

The well was first recorded by ASM Affiliates in 2018. According to historic aerials, historic topographic quadrangles, and Google Earth, the pump station first appears around 1956. The resource remains as last described and consists of an improved water pump with modern water lines and treatment tanks. It was recommended as not NRHP/CRHR eligible at that time.

4.2.2 Newly Identified Resources**AEWSD-RA-1 (Tejon Creek)**

Tejon Creek is an earthen irrigation canal first channelized during the mid-20th century. The recorded segment of this canal measures approximately 14,900-ft (east-west) by 85-ft (north-south) and 10-ft deep. The resource is in good condition and currently in-use.

According to historical aerial photography, USGS Quadrangles, and Google Earth, this segment of Tejon Creek appears to have been channelized sometime between 1943 and 1956. The recorded segment is earthen construction with moderately sloped side walls and with parallel dirt roads on the embankments. The path of the creek is interrupted by asphalt roads where concrete culverts of unknown age have been constructed. Tejon Creek intersects the Arvin-Edison Canal (P-15-007994) and adjacent spreading works on the east. No associated artifacts were identified within or near the resource.

AEWSD-ISO-1

The resource is a single piece of crypto-crystalline silicate (CCS) shatter or possible core with approximately four visible flake scars and 20 percent cortex. The isolate measures 3.5-cm by 4-cm by 1.8-cm. The isolate was identified along the outer edge of an agricultural field and adjacent dirt road.

AEWSD-ISO-2

The resource is a complete fine-grained volcanic (FGV) projectile point likely representing a Tulare Lake Widestem or Pinto variant. The isolate measures 2.5-cm by 2.5-cm by 0.3-cm with a stem width of 1.4-cm. The point likely dates to the Paleoindian Period or Early Horizon. The isolate was identified along the outer edge of an agricultural field and adjacent dirt road.

5. SUMMARY AND RECOMMENDATIONS

A Phase I cultural resource survey was conducted for the AEWSD GWSA Pipeline Project, Kern County, California. This involved a pedestrian survey of approximately 71.8-mi of pipeline, manholes and turnouts representing an 860-ac study area. A records search was conducted at the Southern San Joaquin Valley Archaeological Information Center, California State University, Bakersfield. This indicated that 19 previous archaeological surveys had been completed that covered portions of the study area. An additional 25 previous archaeological surveys had been conducted within a 0.5-mi radius. The records search indicates that 6 cultural resources, all historical Euro-American structures, had been recorded within the study area, with an additional 22 cultural resources within 0.5-mi. The NAHC Sacred Lands files were consulted and no tribal cultural resources are known within the study area. Outreach to tribes and tribal organizations also failed to identify tribal cultural resources in or adjacent to the study area.

The survey fieldwork was conducted in August and September 2020, with parallel transects spaced at 15-meter intervals walked across the study area. A total of nine resources (six previously recorded and three newly identified) were recorded during the survey. The site records for the six previously recorded resources were updated during the survey. These include segments of Tejon Highway (P-15-003545), segments of the Arvin-Edison Canal (P-15-007994), a historic water well (P-15-020334), and segments of three transmission lines (P-15-017243, -017582, and -019115). The three newly identified resources recorded during the survey include one site and two isolated artifacts, which were given temporary field designations. The newly identified site (AEWSD-RA-1) consists of a segment of Tejon Creek, while the two isolated finds consist of a single lithic flake (AEWSD-ISO-1) and a single projectile point (AEWSD-ISO-2).

5.1 RECOMMENDATIONS

Recommendations for the six previously recorded cultural resources are as follows:

Tejon Highway (P-15-003545) – This contemporary road follows the original wagon route from Rose Station and the Tejon Ranch to Arvin. Although the creation and use of this route was associated with a significant historical event, the settlement of the southern San Joaquin Valley, and thus could qualify it for NRHP/CRHR eligibility under Criterion A/1, this is now an improved road that is regularly maintained by Kern County. Although it retains its location, it lacks integrity of design, materials, workmanship, setting, feeling and association. It is recommended as not NRHP/CRHR eligible under any criteria due to this loss of integrity. Construction on or within this resource therefore does not represent an adverse impact to a significant or unique cultural resource.

Arvin-Edison Canal (P-15-007994) - This resource was recorded and evaluated for NRHP/CRHR eligibility in 2015. This evaluation concluded that: “The AEWSD water delivery, recharge, and storage system does not appear to meet NRHP” eligibility under any of the four criteria (Smallwood et al. 2015:37-39). We concur with this recommendation. Construction on or within this resource therefore does not represent an adverse impact to a significant or unique cultural resource.

Big Creek Hydroelectric System Historic District (P-15007994, -017582 and -019115) - Segments of three previously recorded cultural resources within the Project area represent contributing elements of the BCHSHD, which was listed on the NRHP and CRHR in 2016, and thus represents a significant historical resource under CEQA. These three resources, however, are overhead transmission lines that cross the AEWSD pipeline route. Construction of the pipeline and its associated components will not materially affect these powerlines, and will not result in adverse impacts to this historic district.

Kirschemann Water Well (P-15-020334) – This well, constructed circa 1956, was recorded in 2018 and recommended as not NRHP/CRHR eligible. We concur with that recommendation.

AEWSD-RA-1 (Tejon Creek) – This newly recorded cultural resource is an earthen canal that was constructed in the mid-twentieth century. It is not associated with an important historical event (Criterion A/1) or person (Criterion B/2), is a common property type that is not notable in terms of engineering, design, construction or materials (Criterion C/3), and does not have research potential (Criterion D/1). It is recommended as not NRHP/CRHR eligible.

AEWSD-ISO-1 and – 2 - Isolated artifacts are categorically not NRHP/CRHR eligible and do not constitute significant or unique cultural resources.

Based on these assessments, the proposed AEWSD Project does not have the potential to result in adverse impacts to significant or unique historical resources or historic properties. No additional cultural resources work is recommended for this Project. It is recommended that an archaeologist be contacted in the unlikely event that cultural resources are encountered during Project construction and use, however, to evaluate the discovery.

REFERENCES

AEWSD

- 2003 Arvin-Edison Water Storage District Groundwater Management Plan. Report on file, AEWSD, Arvin.

Boyd, W.H.

- 1997 *Lower Kern River Country 1850-1950: Wilderness to Empire*. Kings River Press, Lemoore.

Caltrans

- 1999 *General Guidelines for Identifying and Evaluating Historic Landscapes*. Sacramento: Caltrans.
- 2000 *Water Conveyance Systems in California: Historic Context Development and Evaluation Procedures*. Sacramento: Caltrans.
- 2007 *A Historical Context and Archaeological Research Design for Agricultural Properties in California*. Sacramento: Caltrans.
- 2008 *A Historical Context and Archaeological Research Design for Mining Properties in California*. Sacramento: Caltrans.

Cook, S. F.

- 1978 Historical Demography. In *Handbook of North American Indians, Volume 8, California*, R. F. Heizer, editor, pp. 91-98. Washington, D.C., Smithsonian Institute.

Driver, H.E.

- 1937 Cultural Element Distributions: VI, Southern Sierra Nevada. *University of California Anthropological Records* 1(2):53-154. Berkeley

Elsasser, A.

- 1962 *Indians of Sequoia and Kings Canyon National Parks*. Three Rivers: Sequoia Natural History Association.

Fenenga, F.

- 1952 The Archaeology of the Slick Rock Village, Tulare County, California. *American Antiquity* 17:339-347.

Fredrickson, D.A. and J. Grossman

- 1977 A San Dieguito component at Buena Vista Lake, California. *Journal of California and Great Basin Anthropology* 4:173-190.

Gayton, A.H.

- 1930 Yokuts-Mono Chiefs and Shamans. *University of California Publications in American Archaeology and Ethnology* 24. Berkeley, 361-420.
- 1948 Yokuts and Western Mono Ethnography. *University of California Anthropological Records* 10:1-290. Berkeley.

- Gifford, E.W. and W.E. Schenck
1926 Archaeology of the Southern San Joaquin Valley. *University of California Publications in American Archaeology and Ethnology* 23(1):1-122.
- Harrington, John Peabody
n.d. Yokuts ethnographic notes. National Anthropological Archives.
- Hewes, G.
1941 Archaeological reconnaissance of the central San Joaquin Valley. *American Antiquity* 7:123-133.
- Horne, S.P.
1981 *The Inland Chumash: Ethnography, Ethnohistory and Archaeology*. Ph.D. dissertation, UCSB. University Microfilms, Ann Arbor.
- Jones, T.L., G.M. Brown, L.M. Raab, J.L. McVickar, W.G. Spaulding, D.J. Kennett, A. York and P.L. Walker
1999 Demographic Crisis in Western North America during the Medieval Climatic Anomaly. *Current Anthropology* 40:137-170.
- King, C., C. Smith and T. King
n.d. Archaeological Report Related to the Interpretation of Archaeological Resources Present at the Vasquez Rocks County Park. Report on file, UCLA AIC.
- Kroeber, A.L.
1925 Handbook of the Indians of California. *Bureau of American Ethnology, Bulletin 78*. Washington, D.C.
- Latta, F. F.
1977 *Handbook of the Yokuts Indians*. Bear State Books, Santa Cruz.
- Moratto, M.
1984 *California Archaeology*. New York: Academic Press.
- Morgan, W.A.
1914 *History of Kern County, California with Biographical Sketches*. Los Angeles: Historic Record Company.
- Pacific Legacy, Inc.
2006 Southern San Joaquin Valley Oil Fields Comprehensive Study. Manuscript on file, BLM Bakersfield office.

Powers, Stephen

- 1971 The Yokuts Dance for the Dead. In R.F. Heizer and M.A. Whipple, editors, pp. 513-519, *The California Indians: A Source Book* (second edition). Berkeley, University of California Press (original 1877).
- 1976 *Tribes of California*. Berkeley, University of California Press (original 1877).

Preston, William L.

- 1981 *Vanishing Landscapes: Land and Life in the Tulare Lake Basin*. Berkeley, University of California Press.

Schiffman, R.A. and A.P. Garfinkel

- 1981 Prehistory of Kern County: An Overview. *Bakersfield College Publications in Archaeology, Number 1*.

Siefkin, Nelson

- 1999 Archaeology of the Redfeldt Mound (CA-KIN-66), Tulare Basin, California. M.A. Thesis, Department of Sociology and Anthropology, California State University, Bakersfield.

Smallwood, J., K. Asselin and J.B. Lloyd

- 2015 Cultural Resources Survey and Evaluation for the Arvin-Edison Water Storage District Water Conservation and Efficiency Project, Kern County, California. Report on File, AEWS.

Sutton, M.Q.

- 1988a An Introduction to the Archaeology of the Western Mojave Desert, California. *Archives of California Prehistory, No. 14*. Salinas: Coyote Press.
- 1988b On the Late Prehistory of the Western Mojave Desert. *Pacific Coast Archaeological Society Quarterly* 24(1):22-29.
- 2009 People and Language: Defining the Takic Expansion into the Southern California. *Pacific Coast Archaeological Society Quarterly* 40(2, 3): 31-73.

W&S Consultants

- 2006 Phase II Test Excavations and Determinations of Significance for the Tejon Mountain Village Project, Kern County, California. Report on file, Tejon Ranch Company.

Wedel, W.

- 1941 Archaeological Investigations at Buena Vista Lake, Kern County, California. *Bureau of American Ethnology Bulletin* 130.

Whitley, D.S.

- 1992 Shamanism and Rock Art in Far Western North America. *Cambridge Archaeological Journal* 2(1):89-113.
- 2000 *The Art of the Shaman: Rock Art of California*. Salt Lake City: University of Utah Press.

References

Whitley, D.S. and M.P. Beaudry

- 1991 Chiefs on the Coast: The Development of Complex Society in the Tiquisate Region in Ethnographic Perspective. *The Development of Complex Civilizations in Southeastern Mesoamerica*, W. Fowler, ed., pp. 101-120. Orlando: CRC Press.

Whitley, D.S., G. Gumerman IV, J. Simon and E. Rose

- 1988 The Late Prehistoric Period in the Coso Range and Environs. *Pacific Coast Archaeological Society Quarterly* 24(1):2-10.

Whitley, D.S., J. Simon and J.H.N. Loubser

- 2007 The Carrizo Collapse: Art and Politics in the Past. In *A Festschrift Honoring the Contributions of California Archaeologist Jay von Werlhof*, ed RL Kaldenberg, pp. 199-208. Ridgecrest: Maturango Museum Publication 20.

CONFIDENTIAL APPENDICES