

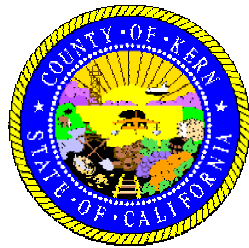
# Draft Environmental Impact Report

SCH#2005091117

*Volume I*  
*Chapters 1 through 10*

**Antelope Valley Water Bank Project**  
*(By Western Development and Storage, LLC)*

**Specific Plan Amendment No. 13, Map 232**  
**Specific Plan Amendment No. 2, Map 233**  
Alteration of Boundaries of  
Agricultural Preserve No. 24 – Inclusion



Kern County  
Planning Department  
Bakersfield, California

April 2006

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**RESOURCE MANAGEMENT AGENCY**

**DAVID PRICE III, RMA DIRECTOR**

Community & Economic Development Department

Engineering & Survey Services Department

Environmental Health Services Department

Planning Department

Roads Department

April 10, 2006

ADDRESSEE LIST (See Distribution List)

Re: **Draft Environmental Impact Report for Antelope Valley Water Bank by Western Development and Storage (Specific Plan Amendment No. 13, Map 232, Specific Plan Amendment No 2, Map 233; Agricultural Preserve No. 24 - Inclusion -Willow Springs Specific Plan)**

Dear Interested Party:

Kern County has prepared a Draft Environmental Impact Report for the construction and operation of facilities to recharge and store imported surface water beneath agricultural properties in the west end of the Antelope Valley in Willow Springs. The proposed recharge and recovery area is a 21 square mile area (13, 440 acres) bounded by Rosamond Boulevard on the north, Avenue A to the south, 170<sup>th</sup> street west to the west and 100<sup>th</sup> Street west. Implementation of the project requires an amendment of the Willow Springs Specific Plan to change approximately 640 acres of residential and industrial designations to agricultural land use.

This Department, as Lead Agency, has determined that preparation of an Environmental Impact Report would be appropriate for the referenced projects. Enclosed is a copy of the Draft Environmental Impact Report (DEIR).

If we have not received a reply from you by **May 24, 2006, at 5:00 P.M.**, we will assume that you have no comments regarding this Draft EIR.

Sincerely,

A handwritten signature in black ink, appearing to read "Don Kohler", is written over a horizontal line.

Don Kohler  
Planner 1

## Chapter 4

# Resources

This chapter is devoted to resource topics. Impacts on a resource are evaluated for the Project site in each section of this chapter. For each resource, data relevant to the environmental setting are presented. The impacts of the Project on the resource are evaluated in terms of significance, and mitigation measures are identified. As Lead Agency, the Planning Department is responsible for determining what mitigation measures are appropriate. Resource sections include:

- Section 4.1, “Agricultural Resources;”
- Section 4.2, “Air Quality;”
- Section 4.3, “Biological Resources;”
- Section 4.4, “Cultural Resources;”
- Section 4.5, “Geology and Soils;”
- Section 4.6, “Hazards and Hazardous Materials;”
- Section 4.7, “Hydrology and Water Quality;”
- Section 4.8, “Land Use and Planning;”
- Section 4.9, “Mineral Resources;”
- Section 4.10, “Noise;”
- Section 4.11, “Population and Housing;”
- Section 4.12, “Transportation and Traffic;” and
- Section 4.13, “Utilities and Services.”

## 4.1 Agricultural Resources

### Introduction

This section of the environmental impact report (EIR) addresses impacts on agricultural resources associated with construction and operation of the proposed Project. The agricultural resources section describes the existing conditions of the site and the regulatory setting and discusses the impacts of the Project and feasible mitigation measures to reduce impacts.

### Environmental Setting

#### Regional

The Project area is located in the Antelope Valley, a semiarid region with gently sloping land that borders the Mojave Desert. Despite the lack of rainfall, the area has been extensively used for agriculture with the benefit of irrigation. The Antelope Valley is generally defined as situated north of the San Gabriel Mountains and east of the Tehachapi Mountains, consisting of portions of northern Los Angeles County and the southeastern portion of Kern County. The Antelope Valley area includes the cities of Lancaster (population 128,928), Palmdale (population 136,734), and California City (population 11,442) (U.S. Census Bureau, 2004 Population Estimates, Census 2000, 1990 Census), as well as the unincorporated communities of Boron, Mojave, North Edwards, Willow Springs, Rosamond, Quartz Hill, Pearblossom, Acton, and Sun Village. Edwards Air Force Base, an aviation testing, research, and development facility, is located in eastern Antelope Valley (Kern County Housing Element 2002).

Between 1990 and 2000, the population of Kern County increased by 22 percent, while the population of the Antelope Valley increased by approximately 10 percent (Kern County Housing Element 2002). The majority of the population growth in the Kern County is occurring largely in the incorporated cities, such as Bakersfield, rather than the unincorporated County areas. Between 1990 and 2000, the population of Bakersfield increased by approximately 72,000 residents and accounted for more than 60 percent of the population growth of the County (Kern County Housing Element 2002).

Agriculture in the Antelope Valley consists of a variety of field, vine, and row crops, including wheat, carrots, and onions (Kern County Department of Agriculture and Measurement Standards 2004). The Los Angeles County General Plan's General Development Policy Map designates the areas along the delivery pipeline route as part of a large swath of land intended for agricultural or other nonurban development (e.g., industrial or commercial land uses) (County of Los Angeles Department of Regional Planning 1980).



## Local

The Project site and surrounding area are in the Willow Springs Specific Plan (WSSP) (in Kern County) and the Antelope Valley Areawide General Plan (in Los Angeles County). Of the approximately 1,500 acres proposed for groundwater recharge facilities, the WSSP designates approximately 988 acres for nonagricultural uses. Although the current designation is nonagricultural, all of the parcels have been used in agricultural functions since at least the 1960s. The applicant has requested that these lands be redesignated to agricultural classification by amendment of the WSSP, which would make the WSSP designations more consistent with the actual use.

The 10 parcels in the Project's recharge area are currently (2005) used for cultivating a variety of crops, including carrots (797 acres), barley (473 acres), wheat (200 acres), and onions (160 acres). The parcels immediately adjacent to the delivery pipeline alignment are primarily agricultural lands or undeveloped parcels.

The Project area lies between 170th Street to the west and 100th Street to the east. The area proposed for the recharge and recovery facilities lies between Rosamond Boulevard to the north and West Avenue A to the south. West Avenue A also marks the boundary between Kern and Los Angeles Counties. Rosamond Boulevard, Avenue A, and 170th Street are paved, 2-lane roads owned and maintained by Kern County. Locally, the Project would be accessed via Avenue A and 170th Street. Gaskell Road is County-owned between 100th Street and 130th Street. Other roads within the area proposed for the recharge and recovery facilities are privately owned and unpaved. The new delivery pipeline is aligned parallel to 170th Street, which is paved in both Kern County and Los Angeles County.

The proposed Phase 2 delivery pipeline extends from the recharge area south to the California Aqueduct. The pipeline alignment generally parallels the east side of 170th Street until that street's intersection with Lancaster Road, at which point the alignment crosses Lancaster Road and continues south to the California Aqueduct. All the roads in the Project area are owned and maintained by the respective counties in which they are located, with the exception of West Avenue D between 170th and 100th Streets, which aligns with State Route 138.

The Project area is located in a rural agricultural setting, with scattered rural residences, and active agricultural lands and undeveloped/dryland grazing lands in the vicinity of the Project site.

## Regulatory Framework

### State Regulations

#### Farmland Mapping and Monitoring Program

Maps of Important Farmlands are prepared by the California Department of Conservation as part of its Farmland Mapping and Monitoring Program. Important Farmland maps are prepared periodically for most of the state's agricultural areas based on information from the Natural Resource Conservation Service's soil survey maps, land inventory and monitoring criteria developed by the Natural Resource Conservation Service, and land use information mapped by the California Department of Water Resources. These criteria generally are expressed as definitions that characterize the land's suitability for agricultural production, physical and chemical characteristics of the soil, and actual land use. Important Farmland maps generally are updated every 2 years. Figure 4.1-1 shows the Important Farmland mapping information for the Project area.

The Farmland Mapping and Monitoring Program mapping system incorporates eight mapping categories: five related to farmlands and three associated with lands used for nonagricultural purposes. The five farmland mapping categories are summarized below.

- **Prime Farmland:** Lands with the combination of physical and chemical features best able to sustain long-term production of agricultural crops. The land must be supported by a developed irrigation water supply that is dependable and of adequate quality during the growing season. It also must have been used for the production of irrigated crops at some time during the 4 years before mapping data were collected.
- **Farmland of Statewide Importance:** Lands with agricultural land use characteristics, irrigation water supplies, and physical characteristics similar to those of Prime Farmland but with minor shortcomings, such as steeper slopes or less ability to retain moisture.
- **Unique Farmland:** Lands with lesser-quality soils used for the production of California's leading agricultural cash crops. These lands usually are irrigated but may include nonirrigated orchards or vineyards, as found in some of the state's climatic zones.
- **Farmland of Local Importance:** Lands of importance to the local agricultural economy, as determined by each county's board of supervisors and a local advisory committee.
- **Grazing Land:** Lands in which the existing vegetation is suited to the grazing of livestock.

As shown in Table 4.1-1, the Project could affect approximately 1,763 acres of Important Farmland.

**Table 4.1-1.** Important Farmlands Affected by the Project

Project Feature	Farmland Mapping and Monitoring Program Category (acres)				
	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance	Grazing Land
Recharge basins	1,509	< 1	< 1	–	–
Distribution/Recovery pipeline	24	–	–	–	–
Recovery pipelines	61	16	2	–	–
Delivery pipeline	15	–	–	64	56
Recovery wells	13	1	<1	–	–
<b>Total</b>	<b>1,622</b>	<b>17</b>	<b>2</b>	<b>64</b>	<b>56</b>

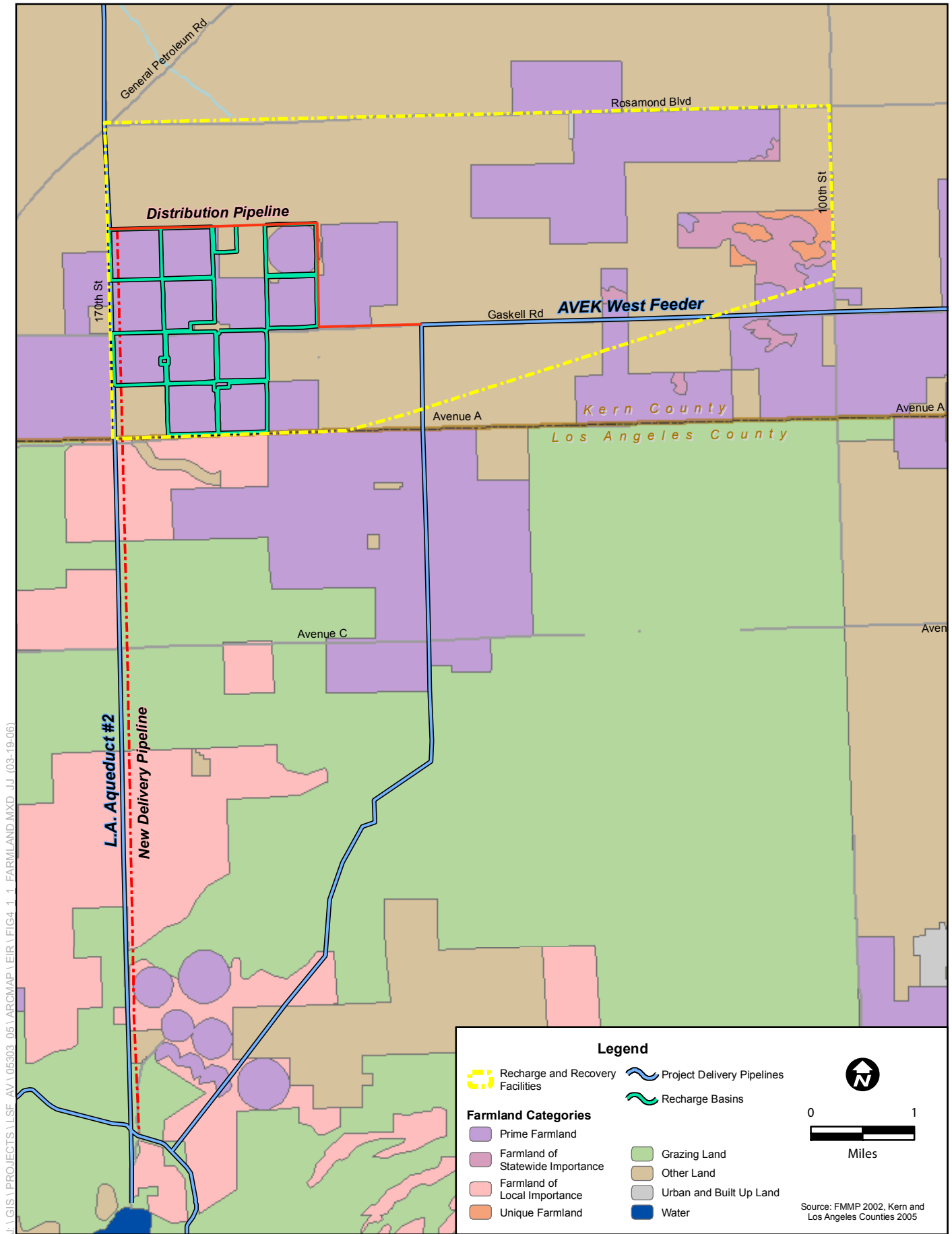
### California Land Conservation Act (Williamson Act)

The California Land Conservation Act, better known as the Williamson Act, was enacted by the California State Legislature in 1965 to encourage the preservation of agricultural lands. The Williamson Act program permits property tax adjustments for those landowners who voluntarily contract with a city or county to create an agricultural preserve and agree to keep their land in agricultural production or another approved compatible land use for at least 10 years. By agreeing to restrict the use of the land, the landowner receives a reduced property tax assessment based on the value of the land for its current use, rather than its market value under some other classification (e.g., residential or industrial). The contracts are automatically renewed each year unless a notice of nonrenewal is filed by the landowner with the county clerk. An application for immediate cancellation can also be requested by the landowner, provided that the proposed immediate cancellation application is consistent with the cancellation criteria stated in the California Land Conservation Act and those adopted by the affected county or city. Nonrenewal or immediate cancellation does not change the zoning of the property.

The Williamson Act defines compatible uses on agricultural preserves as any use determined to be compatible by the county or city administering the preserve, provided it does not violate the principles of compatibility set forth in the Williamson Act.

### Farmland Security Zone Act

The Farmland Security Zone Act is similar to the Williamson Act and was passed by the California State Legislature in 1999 to ensure that long-term farmland preservation is a part of public policy. Farmland Security Zone Act contracts are sometimes referred to as “Super Williamson Act Contracts.” Under the provisions of this act, a landowner already under a Williamson Act contract can apply for Farmland Security Zone status by entering into a contract with the county. Farmland Security Zone classification automatically renews each year for an additional 20 years. In return for a further 35-percent reduction in the taxable value of land and growing improvements (in addition to Williamson Act



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**Figure 4.1-1**  
**Project Site Farmland Categories**

tax benefits), the owner of the property promises not to develop the property into nonagricultural uses.

## Local Regulations

### **Kern County General Plan**

The Kern County General Plan (Kern County Planning Department 2004) states that agriculture is vital to the future of Kern County; it sets the goals of protecting important agricultural lands for future use and preventing the conversion of prime agricultural lands to other uses (e.g., industrial or residential). Under the general plan, agricultural uses fall under a resource class of land use designations. Water storage and groundwater recharge facilities are considered acceptable uses on lands designated Intensive Agriculture (8.1), Resource Reserve (8.2), Extensive Agriculture (8.3), or Resource Management (8.5) (Figure 4.1-2). The Kern County General Plan, adopted June 15, 2004, contains the following policies.

### **Land Use/Conservation/Open Space Element Resource**

#### ■ Policies

- Areas of low intensity agriculture use (Map Code 8.2 (Resource Reserve), Map Code 8.3 (Extensive Agriculture), Map Code 8.5 (Resource Management)) should be of an economically viable size in order to participate in the State Williamson Act Program/Farmland Security Zone Contract.
- Areas designated for agricultural use, which include Class I and II and other enhanced agricultural soils with surface delivery water systems, should be protected from incompatible residential, commercial, and industrial subdivision and development activities.
- Areas identified by the Natural Resource Conservation Service (formerly Soil Conservation Service) as having high range-site value should be conserved for Extensive Agriculture uses or as Resource Reserve, if located within a County water district.

#### ■ Implementation Measures

- The County Planning Department will seek review and comment from the County Engineering and Survey Services Department on the implementation of the National Pollution Discharge Elimination System for all discretionary projects.
- Prime agricultural lands, according to the Kern County Interim-Important Farmland 2000 map produced by the Department of Conservation, which have Class I or II soils and a surface delivery water system shall be conserved through the use of agricultural zoning with minimum parcel size provisions.

**Zoning**

The Kern County Zoning Ordinance (Kern County Planning Department 2005) states that one of the primary goals of agricultural zoning designations is to identify lands with agricultural potential and prevent the premature conversion of these lands to nonagricultural uses. The portion of the Project located in Kern County is zoned predominantly Exclusive Agriculture (A) and Estate (E), as is most of the surrounding area (See Figure 4.1-3). Both of these zoning designations list water storage and groundwater recharge as permitted uses.

**Williamson Act Standard Uniform Rules**

Kern County has adopted a set of Agricultural Preserve Standard Uniform Rules that identify land uses that are considered compatible uses within agricultural preserves established under the Williamson Act. These rules are designed to restrict the uses of land enrolled in a Williamson Act contract to agriculture or other compatible uses. Agricultural uses include crop cultivation, grazing operations, livestock breeding, dairies, and uses that are incidental to agricultural uses. Other compatible uses include the erection of gas, electric, communications, water, and other similar public utilities (Kern County Planning Department 2004).

**Willow Springs  
Specific Plan**

A relevant goal and policy from the WSSP are provided below.

**Resource Element****■ Goal**

- Encourage retention of productive agricultural and dormant mineral resources by imposing a restriction on allowing urban type land uses on nearby adjacent lands.

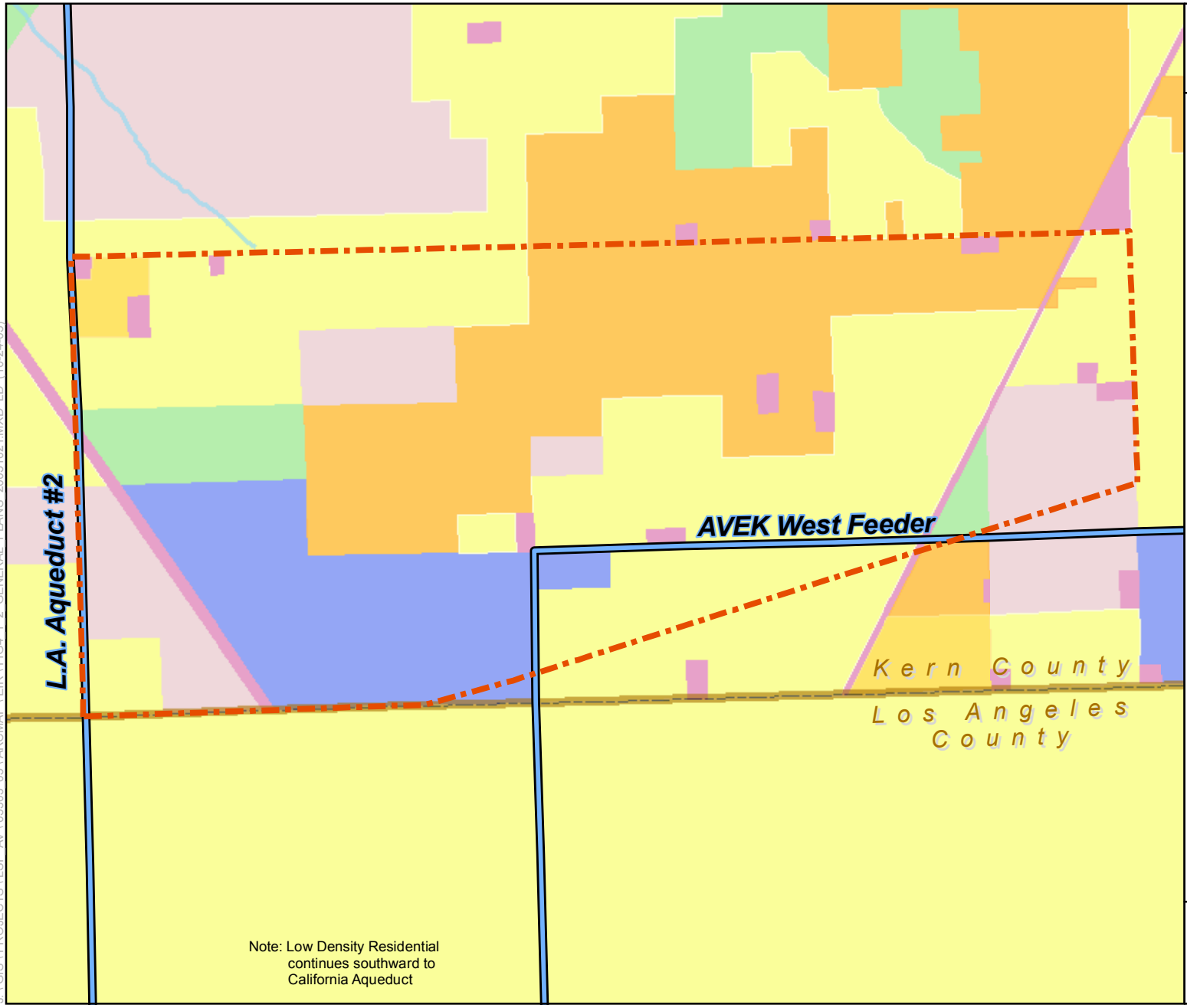
**■ Policy**

- Require review of discretionary projects in those areas designated for Resource use by the appropriate agency to determine potential resource loss.

**Los Angeles County****General Plan**



The portions of the delivery pipeline route located in Los Angeles County are in an area covered by the Antelope Valley Areawide General Plan, a component of the Los Angeles County General Plan. The Antelope Valley Areawide General Plan defines certain areas in the Antelope Valley as Special Management Areas, deserving of specialized attention because their unique characteristics (County of Los Angeles Department of Regional Planning 1986). These management areas include Agricultural Opportunity Areas, which are defined as lands that have historically served as major centers of agriculture in the Valley and are to be preserved and protected from incompatible uses (County of Los Angeles Department of Regional Planning 1986). A relevant goal and policy are provided below.

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### Antelope Valley Water Bank Project

#### Legend

-  Project Delivery Pipelines and Canals
-  Recharge and Recovery Facilities

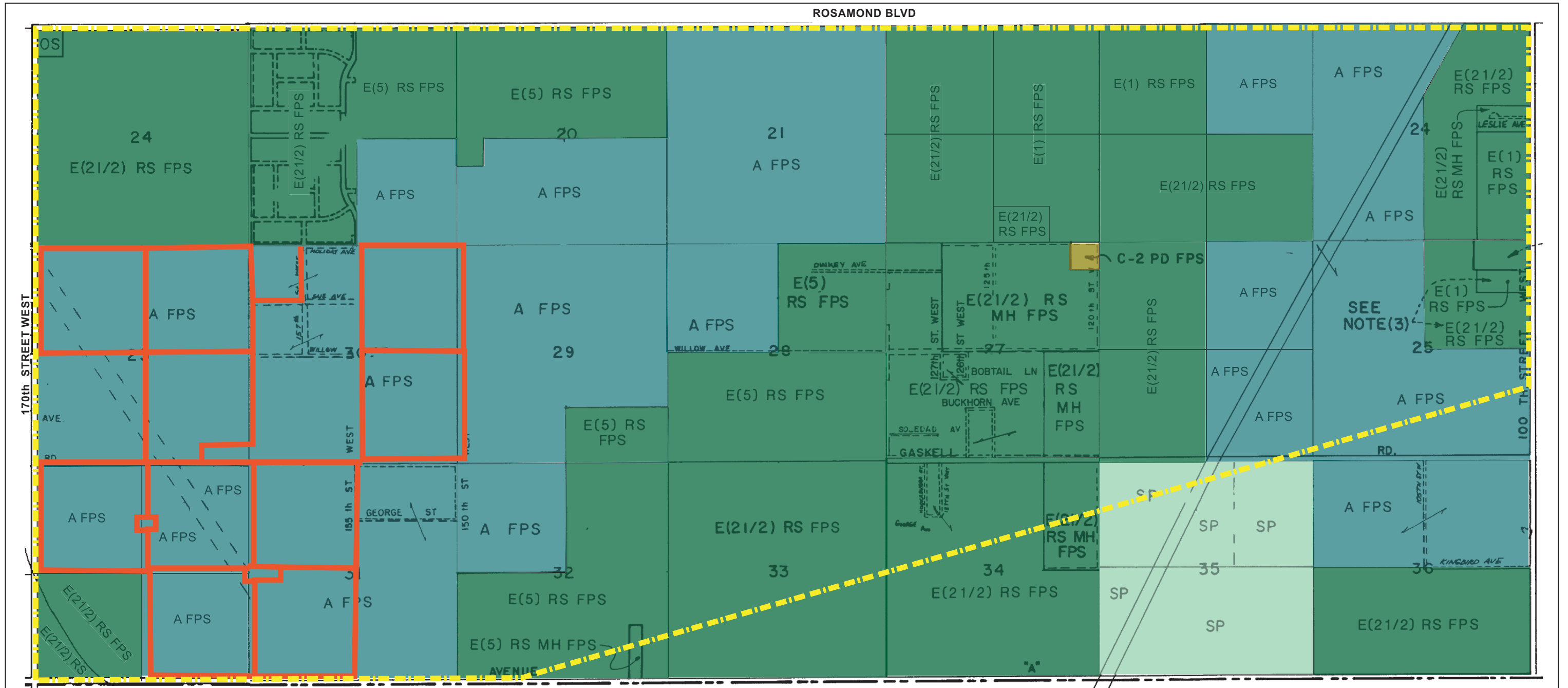
#### General Plan Land Use

-  Agriculture
-  Industrial
-  High Density Commercial
-  Low Density Commercial
-  High Density Residential
-  Medium Density Residential
-  Low Density Residential
-  Very Low Density Residential
-  Open Space Public Lands
-  Planned Development
-  Other - Undetermined

Note: Low Density Residential continues southward to California Aqueduct



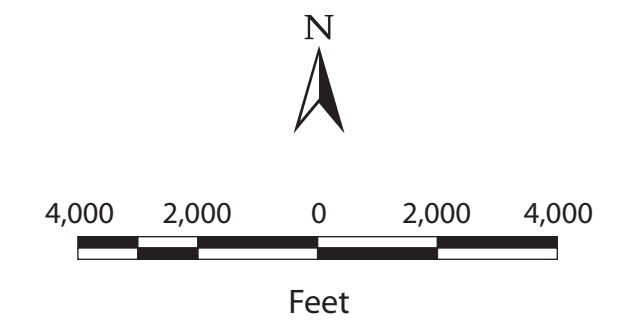
**Figure 4.1-2**  
**County General Plans**



**LEGEND**

- ZONING DESIGNATIONS:**
- A - Exclusive Agriculture
  - C - Commercial
  - E - Estate (1/4 to 20 acre areas)
  - SP - Special Planning
- COMBINING DISTRICTS:**
- FPS - Floodplain (Secondary Combining)
  - MH - Mobilehome Combining
  - RS - Residential Suburban Combining

- Recharge and Recovery Facilities
- Recharge Basins



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### ***Conservation, Open Space and Recreation Ecological Resources***

#### ■ **Goal**

- To preserve and protect prime agricultural lands, forests, fisheries, significant ecological areas, and other biotic resources.

#### ■ **Policy**

- Protect significant agricultural resource areas and encourage the expansion of agricultural activities into underutilized lands such as utility rights-of-way and flood prone areas.

### ***Zoning***

According to the County of Los Angeles Department of Regional Planning, the properties along the pipeline alignment are zoned as a combination of A-1 (Light Agriculture) and A-2 (Heavy Agriculture), at a variety of densities (Lin pers. comm.). The Los Angeles County Code lists uses that are permitted in the various zoning districts. Zoning districts A-1 and A-2 allow the following uses, subject to approval of a conditional use permit (County of Los Angeles 2005, §22.24.100):

Water reservoirs, dams, treatment plants, gauging stations, pumping stations, tanks, wells, and any use normal and appurtenant to the storage and distribution of water.

During Phase 2, a new delivery pipeline would be constructed to deliver SWP water from the California Aqueduct to recharge facilities for storage and for delivery of recovered water back to the California Aqueduct. The 8.75-mile-long pipeline would be constructed parallel to LAA #2 (see Figure 3-5 in Chapter 3, “Project Description”). The pipeline would connect the south end of the new delivery pipeline to the California Aqueduct and the north end to the distribution/recovery pipeline installed during Phase 1. Installation of a new pipeline within Los Angeles County is considered a use “appurtenant to the storage and distribution of water.” Therefore, a conditional use permit will be required prior to the construction of the pipeline within Los Angeles County (Alexanian pers. comm.).

### ***Antelope Valley Areawide General Plan***

Relevant policies of the Antelope Valley Areawide General Plan are provided below.

### ***Land Use***

#### ***Agricultural Lands***

#### ■ **Policy**

- Within designated “Agricultural Opportunity Areas,” carefully evaluate extension of urban and suburban uses (outside the urban areas and the rural communities) for its impact on adjacent agricultural operations.

### ***Environmental Resource Management Managed Resource Production***

#### **■ Policy**

- Encourage the continued production of existing agricultural lands within the Antelope Valley.

## **Impact Analysis**

This section describes the methods used to determine the Project's impacts relating to agricultural resources and lists the thresholds used to conclude whether an impact would be significant.

## **Methodology**

For the purpose of this analysis, it was assumed that there could be two types of impacts on agricultural lands as a result of the Project: direct impacts and indirect impacts. Direct impacts include physical changes to the environment that could result in the conversion of lands to nonagricultural land uses. Indirect impacts occur as a result of changes in the way that lands are maintained and/or operated that could indirectly result in the conversion of lands to nonagricultural uses.

All pipelines associated with the Project would be below ground. Therefore, the analysis below assumes that the areas disturbed during pipeline construction would be available for agricultural production once construction is complete. Consequently, the following analysis focuses on impacts related to the construction and operation of distribution ditches, recharge basins, and recovery wells.

## **Thresholds of Significance**

The Kern County CEQA Implementation Document and Kern County Environmental Checklist state that a project would have a significant impact on agricultural resources, if it would:

- 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 nonagricultural use;
- conflict with existing zoning for agricultural use or Williamson Act contracts;
- involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to nonagricultural use; or

- result in the cancellation of an open space contract made pursuant to the California Land Conservation Act of 1965 or Farmland Security Zone Contract for any parcel of 100 or more acres (Public Resources Code Section 15206[b][3]).

## Impacts and Mitigation Measures

### Impact 4.1-1: Convert Important Farmland to Nonagricultural Use

As described under Section 4.1.2.2, “Regulatory Framework,” the Project is expected to affect approximately 1,763 acres of Important Farmlands and result in construction-related impacts and operational impacts. Portions of the Project area (e.g., pipeline routes) are assumed to be available for agricultural uses following construction, and the recharge basins would be available for agricultural uses when not engaged in recharge activities; therefore, the analysis of the potential for the Project to convert Important Farmlands to nonagricultural uses is divided into three categories:

- *temporary impacts* associated with Project construction,
- *periodic impacts* associated with flooding of the recharge basins, and
- *permanent impacts* related to wellhead and aboveground infrastructure construction.

#### Temporary Impacts

Construction of the recharge basins and pipelines would temporarily disturb about 1,672 acres of Important Farmlands. Construction of the recharge basins is expected to take 6 months, and construction of the pipelines is expected to take 6 to 12 months. Following construction of the pipelines, agricultural practices could resume where the pipelines had been placed. Agricultural practices also could resume in the recharge basins, but continued farming in the basins would be subject to periodic interruptions associated with recharge activities, as described below under “Periodic Impacts.” Although they would disturb agricultural activities, these temporary impacts on Important Farmlands would cease on completion of construction activities and would not permanently convert Important Farmland to nonagricultural use.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

#### Periodic Impacts

During recharge operations, the Project would periodically disrupt agricultural activities on approximately 1,500 acres of Prime Farmlands and less than 1 acre each of Farmland of Statewide Importance and Unique Farmland because inundation of the recharge basins would make them temporarily unavailable for agricultural production. The recharge operations would occur primarily during

the winter and early spring, as water is available. Based on historical patterns of SWP water availability, it is anticipated that significant quantities of water would be available approximately 3 out of 10 years, on average. The recharge basins would be used for organic farming purposes when not needed for recharge. Recovery of stored water would not be anticipated to disturb agricultural activities. Pipelines associated with the Project would be below ground and would not cause the permanent conversion of farmland during operation because these areas are assumed to be available for agricultural uses. Therefore, recharge activities would only periodically disrupt agricultural production for a few months every few years and would not permanently convert Important Farmland to nonagricultural use.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

### **Permanent Impacts**

The only permanent conversion of Important Farmlands by the Project would result from the installation of wellheads for water recovery and the construction of berms and ditches to service the recharge basins. Approximately 30 to 40 new wells are anticipated to be constructed as part of the Project, and each wellhead is estimated to occupy approximately 0.1 acre of ground. Assuming a worst-case scenario that 40 wells are located on Important Farmlands, the Project could result in a net loss of up to 4 acres of Important Farmlands. The actual loss would likely be less because there is usually ample space along the unproductive fringes of fields for well installation. The berms and ditches also are considered to be permanent conversions of farmlands because, unlike the recharge basins and the pipeline alignments, they would be unavailable for agricultural production. These areas account for an additional 77 acres of Prime Farmland. Although the Project would permanently remove approximately 81 acres of Important Farmlands from active farming, the Project is not considered a nonagricultural use because affected local agencies consider water banking facilities and supporting infrastructure to be consistent with agricultural uses (see discussion below under Impact 4.1-2 for more information). In addition, ditches would be used by farming operations for delivery of irrigation water. Furthermore, these permanent disturbances are physically similar to the types of disturbances that occur with other agricultural uses currently on site (e.g., construction of groundwater wells and irrigation ditches).

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

## **Impact 4.1-2: Conflict with Existing Agricultural Zoning or Williamson Act Contracts**

### **Kern County**

Although the WSSP does not designate the Project parcels for agricultural uses, all of the parcels have been actively farmed as an interim use since at least the 1960s and are zoned for Exclusive Agriculture (A) uses, as is much of the land in the Project vicinity. The Kern County Zoning Ordinance lists water storage and recharge facilities as permitted uses for all Agricultural Zoning Districts. The Project would therefore not conflict with the zoning of the properties or their current land uses.

Six of the parcels in the recharge area are enrolled in Williamson Act contracts and encompass approximately 959 acres. The Department has determined that if the project's operation provides 8 to 10 months of use with a qualified agricultural use, the project is compatible with the Uniform rules adopted by Kern County for Williamson Act Contracts. The Project does not propose to alter or cancel any existing Williamson Act contracts or to permanently remove these lands from agricultural use.

The Project would not conflict with agricultural zoning or Williamson Act contracts in Kern County.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

### **Los Angeles County**

The installation of a water pipeline in conjunction with a water storage and/or distribution operation is considered "normal and appurtenant" to facility operations (County of Los Angeles 2005, §22.24.100). As such, the pipeline route would not conflict with Los Angeles County zoning. According to the California Department of Conservation, Los Angeles County does not participate in the Williamson Act Program (California Department of Conservation 2003). Therefore, the Project would not conflict with agricultural zoning or Williamson Act contracts in Los Angeles County.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

## **Impact 4.1-3: Involve Other Changes in the Existing Environment That, Because of Their Location or Nature, Could Result in Conversion of Farmland to Nonagricultural Use**

The Project would result in minor changes in current practices at the site because during the occasional recharge years agricultural production would occur

approximately 8 to 10 months of the year, compared with year-round—or nearly year-round—cultivation of the site. Although the Project area is located in an area planned for industrial development under the WSSP, the site itself and much of the land surrounding the site has historically, and is currently, used for agricultural purposes.

The construction phase of the Project may disturb agricultural activities; however, because of the temporary nature of construction, this impact is considered less than significant. During the operation phase, the Project site would be engaged in continued agricultural production most years and for most of the year during recharge years. Installation of the pipeline could alter agricultural production on the affected properties for a short duration during construction; however, there would be no lasting effect on their use for agricultural purposes. The pipeline would be installed below ground and would not require the conversion of existing farmland to nonagricultural use. As such, the land would continue to be used for agricultural purposes.

Because one of the Project's objectives is to increase water supply reliability for municipal and industrial users, there is a potential for the Project to encourage conversion and degradation of farmland elsewhere. This impact is discussed in greater detail in Chapter 5, "Mandatory CEQA Considerations," under Section 5.1, "Growth-Inducing Impacts." It should be noted, however, that the Project would leave behind 10 percent of all imported recharge water. Over time, this donation to the aquifer would help to maintain groundwater pumpage costs at affordable rates for surrounding farmers, thereby helping to preserve local agriculture.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

#### **Impact 4.1-4: Potential Adverse Soil and Crop Effects from Elevated Groundwater Levels**

The Project would involve the recharge of the aquifer with relatively high quality water that has been applied for irrigation of the area for more than 25 years. (See Section 4.7, Hydrology and Water Quality.)

Adjacent to the recharge basins, the water table could rise to within several feet of the ground surface during periods of recharge. Soil and substrate permeabilities in the area generally are relatively high, which suggests that the water table mound formed during recharge would have relatively steep slope and would diminish rapidly after cessation of inflow. Nevertheless, during recharge periods, the water table could rise to within the root zone of crops on farmlands immediately adjacent to the recharge basins.

This temporarily shallow groundwater would not be expected to cause salinization because the infiltrating water would not be saline. However, the

shallow water table could interfere with crop growth if it occurs at a time when moisture depletion is essential to crop development. To ensure that this condition is monitored, a mitigation measure requiring that a monitoring committee assess this situation has been imposed.

**Mitigation Measure:**

**Mitigation Measure 4.1-1:** The Antelope Valley Water Bank monitoring committee will develop a monitoring procedure to discern whether recharge-induced shallow water tables are rising toward the root zones of adjacent farmlands and, if so, whether they would adversely affect crop production. If the monitoring committee concludes that crops may be (or have been) affected, the committee will require the owner/operator to constrain or adjust the locations of recharge operations to prevent the impact or to reimburse the affected farmer for the impact that has occurred.

**Level of Significance after Mitigation:** Less than significant.

**Impact 4.1-5: Cause the Cancellation of an Open Space Contract Made Pursuant to the California Land Conservation Act Or Farmland Security Zone Contract for Any Parcel of 100 or More Acres**

The recharge area contains six parcels, totaling 959 acres, that are enrolled in Williamson Act contracts. Neither recharge operations nor pipeline installation would cause the cancellation of an open space contract made pursuant to the California Land Conservation Act. There would be no change in the existing contracts. No Farmland Security Zone Act contracts would be affected by the Project.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

## Cumulative Impact

Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The cumulative impact scenario for the Project includes seven specific projects identified by Kern and Los Angeles Counties, and buildout of the Kern County General Plan. A detailed description of the cumulative impact scenario considered with the proposed Project is provided in Chapter 3, "Project Description," and the project list is presented below.

A cumulative impact analysis first identifies whether a cumulatively significant impact exists in the given resource area. If so, it determines whether the project will make a considerable contribution to that impact. Where a cumulative impact

is severe, even a small contribution may be considerable (Section 15130(b) of the State CEQA Guidelines).

**Table 4.1-2. Relevant Cumulative Projects**

Case Number (if applicable)	Project Name	Project Location	Approximate Distance to Project Site	Project Type	Project Description
<b>Kern County</b>					
GPA 1, Map 218	Tejon Mountain Village Specific Plan	East of I-5 in the hills north and east of Castaic Lake	14 miles northwest of project site	Major Residential/commercial/recreational development	3,450 single family units (s.f.u.) homes on 23,000-acre planning area,
GPA, Map 255	Lebec Canyon Estates	East of Frazier Mountain Park Road/I-5 interchange	22 miles west of project site	Residential development	32 s.f.u on 1,000 acres
SPA 8, Map 254, Amend. Zone Map 254, Zone Change 6, SP 1, Map 254, Vesting Tent. Tract 6436	Frazier Park Estates	Southern boundary of Kern Co. and portion of LA County, west of I-5 south of Frazier Mountain Park Road	24 miles west of project site	Residential / Commercial development	705 s.f.u. and 135 thousand sq. ft of commercial on 847 acres in Kern County and 323 in LA County
GPA to 5.7, Map 215	Christine Bower	One quarter mile west of 105 <sup>th</sup> Street and McConnell Road near Rosamond	3 miles north of project site	General Plan Amendment and Zone	4 s.f.u on 20-acre site
ZC to A-1, Map 231	Julien and Assoc.	8684 Sweetser Road, Rosamond (APN 315-081-09)	3-1/2 miles northeast of project site	Commercial greenhouses	60-acre site
<b>Los Angeles County</b>					
N/A	Centennial Specific Plan	1 mile east of I-5, adjacent to SR-138	12 miles southwest of project site	Large-scale new community; including residential/commercial development	23,000 dwelling units and 14 million sq. ft. commercial on 11,700 acres
N/A	Gorman Ranch	Gorman Post Road, north of SR-138, east of I-5	17 miles southeast of project site	Residential	227 s.f.u. on 2,500 acres



## Kern County General Plan

According to the draft Program EIR for the Kern County General Plan Update (July 2003) (GP PEIR), the actual conversion of prime and important farmland in the General Plan update area is relatively small in comparison to the over 690,000 acres of land still in production, with most under long-term Williamson Act or Farmland Security Zone contracts. Land that is converting to urban uses is directly adjacent to the growing cities, which are annexing the land.

Pending General Plan amendments currently total 1,422 acres from resource designations to residential, commercial or industrial uses, excluding the Metropolitan Bakersfield General Plan. Furthermore, an additional 12,125 acres is being redesignated from federal lands and resource designations to 8.5 (Resource Management) for landfill buffering and the Chevron/Texaco Habitat Conservation Plan.

If all redesignations were approved, it would result in the conversion of 929.29 acres of land for urban uses. Overall, this is less than 0.5 percent of all the mapped important farmland in the County. As such, the potential for conversion of prime agricultural land, while an important land use issue *per se*, is not occurring at a cumulatively significant level in the Kern County General Plan update area.

## Relevant Projects

Of the projects contained in the cumulative scenario outlined above, the largest (**Tejon Mountain, Lebec Canyon Estates, Frazier Park, Centennial, and Gorman Ranch**) are more than 10 miles away from the proposed Project and are located in areas of hillside and mountainous terrain, greatly limiting the amount of prime and important farmland conversion. The smaller local projects that are located in the Antelope Valley are very small and do not account for a significant conversion (Bower and Julien). In fact, the Julien project requests a zoning change to agriculture. Therefore, taken together, the projects contained in the cumulative scenario would not result in a cumulative significant impact on agricultural resources.

With respect to the proposed Project, installing recovery wells, berms, and ditches could convert up to 80 acres of Important Farmland. The remainder of the Project lands would stay in agricultural use, subject to periodic interruption when the basins are used for recharge. The Project, however, is not considered a “nonagricultural use” because water banking facilities and supporting infrastructure are considered consistent with agricultural uses by the affected local agencies. Therefore, the Project would not contribute to the Countywide conversion of prime or important farmland.

As stated in Agricultural Resources Impact 4.1-1, the project will *temporarily (8–12 months) and periodically (a few months every few years)* disturb about 1,670 acres of Important Farmland. Permanent impacts would occur on up to 4 acres as

a result of the construction of wellheads and 77 acres for berms and ditches. However, as stated above, these uses are not considered to be non-agricultural uses, and therefore no impact would occur. Therefore, the project would not contribute to a cumulative impact.

Additionally, as stated in Impact 4.1-2, the Project would not conflict with existing agricultural zoning because it is not designated as such in the WSSP, and the proposed use is consistent with the Williamson Act contracts applicable to six of the parcels totaling 959 acres. The proposed water pipeline located in Los Angeles County is also an acceptable use under existing designations as a “normal and appurtenant” facility, and no conflict would occur.

As discussed in Impact 4.1-3, an assessment of the Project’s changes leading to other agricultural land was conducted. The construction phase of the Project may disturb agricultural activities; however, because of the temporary nature of construction, this impact is considered less than significant. During the operation phase, the Project site would be engaged in continued agricultural production most years and for most of the year during recharge years.

Installation of the pipeline could alter agricultural production on the affected properties for a short time during construction; however, there would be no lasting effect on their use for agricultural purposes. The pipeline would be installed belowground and would not require the conversion of existing farmland to nonagricultural use. As such, the land would continue to be used for agricultural purposes.

While the Project does have the potential to result in salinization (Impact 4.1-4), it is not anticipated to because the infiltrating water would not be saline. However, the shallow water table could interfere with crop growth if it occurs at a time when moisture depletion is essential to crop development. To ensure that this condition is monitored, a mitigation measure requiring that a monitoring committee assess this situation has been imposed (Mitigation Measure 4.1-1).

Finally, the Project will not require cancellation of any open space contract (Impact 4.1-5).

For all of the reasons stated above, the proposed Project is not expected to contribute considerably to a cumulatively significant impact on Agricultural Resources.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

## 4.2 Air Quality

### Introduction

This section of the EIR addresses the impacts on air quality associated with construction and operation of the proposed project. The air quality section describes the existing conditions of the site and the regulatory setting and discusses the impacts of the project and feasible mitigation measures to reduce impacts.

### Concepts and Terminology

Areas such as Kern County, the Mojave Desert Air Basin and Antelope Valley are classified as either *attainment* or *nonattainment* with respect to state and federal ambient air quality standards. These classifications are determined by comparing actual monitored air pollutant concentrations to state and federal standards. The attainment status of a region also affects the significance threshold for air quality impacts and determines the permitting requirements for proposed equipment.

Within the MDAB, the pollutants of primary concern are ozone, particulate matter 10 microns in diameter or less (PM10), and particulate matter 2.5 microns in diameter or less (PM2.5). Ozone results from the reaction of two other pollutants—reactive organic gases (ROG) and nitrogen oxides (NO<sub>x</sub>)—in the presence of sunlight. Both PM10 and PM2.5 can be emitted directly from combustion processes or as fugitive dust. They also can form in the atmosphere from the reaction of precursors. Both classes of particulates can be harmful to human health because they can be inhaled deeply into the lungs.

## Environmental Setting

### Existing Conditions

#### General

Ambient air quality is affected by the climate, topography, and the type and amount of pollutants emitted. The proposed location for the Project is subject to a combination of topographical and climatic factors that result in high potential for regional and local accumulation of pollutants. The following discussion describes climatic and topographic characteristics of the MDAB, relevant air quality standards, and existing air quality conditions within the basin.

### **Climate and Topography**

The Antelope Valley experiences extreme variations in daily temperature and an average annual precipitation of less than 10 inches. Almost all the precipitation arrives in winter. Freezing temperatures occur in winter, while summers are hot, dry, and windy.

The Mojave Desert is characterized by flat valleys and low, barren mountains, ranging in elevation from 2,000 to 5,000 feet above sea level. It is bordered on the north and west by the Sierra Nevada, Tehachapi, San Gabriel, and San Bernardino Mountains, and merges with the Colorado Desert in the southeast.

### **Ambient Air Quality Standards and Existing Air Quality Conditions**

The federal and state governments have established ambient air quality standards for seven criteria pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), PM<sub>10</sub>, PM<sub>2.5</sub>, and lead. Ozone, PM<sub>10</sub>, and PM<sub>2.5</sub> are generally considered regional pollutants because they or their precursors affect air quality on a regional scale. Pollutants such as CO, NO<sub>2</sub>, SO<sub>2</sub>, and lead are considered local pollutants that tend to accumulate in the air locally. PM<sub>10</sub> and PM<sub>2.5</sub> are considered both localized and regional pollutants. In the area where the proposed Project is located, PM<sub>10</sub>, PM<sub>2.5</sub>, and ozone are of particular concern.

The State of California has classified MDAB as being in moderate nonattainment for ozone and in nonattainment for PM<sub>10</sub>. The Kern County Air Pollution Control District (KCAPCD) has adopted an air quality improvement plan that addresses NO<sub>x</sub> and ROGs, both of which are ozone precursors and contribute to the secondary formation of PM<sub>10</sub> and PM<sub>2.5</sub>. The plan specifies that regional air quality standards for ozone and PM<sub>10</sub> concentrations can be met through the use of additional source controls and trip reduction strategies. It also establishes emissions budgets for transportation and stationary sources. Those budgets, developed through air quality modeling, reveal how much air pollution can occur in an area before national ambient air quality standards (NAAQS) are violated.

The state ambient air quality standards are summarized in Table 4.2-1. Tables 4.2-2, 4.2-3, and 4.2-4 summarize the air quality monitoring data taken from the Mojave monitoring station that KCAPCD uses to measure air quality. This site monitors ozone, NO<sub>x</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> concentrations.

#### ***Ozone***

Ozone is not emitted directly into the air but is formed by a photochemical reaction in the atmosphere. Ozone precursors, which include ROGs and NO<sub>x</sub>, react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. The ozone precursors—ROGs and NO<sub>x</sub>—are emitted by stationary combustion engines and mobile sources such as construction equipment.

Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other

**Table 4.2-1. Applicable State and Federal Ambient Air Quality Standards**

Pollutant	Symbol	Average Time	Standard, as parts per million		Standard, as micrograms per cubic meter		Violation Criteria	
			California	Federal	California	Federal	California	Federal
Ozone	O <sub>3</sub>	1 hour	0.09	0.12	180	235	If exceeded	If exceeded on more than 3 days in 3 years
		8 hours	0.07	0.08	137	157	NA	If exceeded on more than 3 days in 3 years
Carbon monoxide	CO	8 hours	9.0	9	10,000	10,000	If exceeded	If exceeded on more than 1 day per year
		1 hour	20	35	23,000	40,000	If exceeded	If exceeded on more than 1 day per year
Nitrogen dioxide	NO <sub>2</sub>	Annual average	NA	0.053	NA	100	NA	If exceeded
		1 hour	0.25	NA	470	NA	If exceeded	NA
Sulfur dioxide	SO <sub>2</sub>	Annual average	NA	0.03	NA	80	NA	If exceeded
		24 hours	0.05	0.14	131	365	If exceeded	If exceeded on more than 1 day per year
Hydrogen sulfide	H <sub>2</sub> S	1 hour	0.25	NA	665	NA	NA	NA
		1 hour	0.03	NA	42	NA	If equaled or exceeded	NA
Vinyl chloride	C <sub>2</sub> H <sub>3</sub> Cl	24 hours	0.010	NA	26	NA	If equaled or exceeded	NA
Inhalable particulate matter	PM10	Annual geometric mean	NA	NA	20	NA	If exceeded	NA
		Annual arithmetic mean	NA	NA	NA	50	NA	If exceeded
		24 hours	NA	NA	50	150	NA	If exceeded on more than 1 day per year
Fine particulate matter	PM2.5	Annual arithmetic mean	NA	NA	12	15	NA	If exceeded
		24 hours	NA	NA	NA	65	NA	If exceeded on more than 1 day per year
Sulfate particles	SO <sub>4</sub>	24 hours	NA	NA	25	NA	If equaled or exceeded	NA
Lead particles	Pb	Calendar quarter	NA	NA	NA	1.5	NA	If exceeded no more than 1 day per year
		30 days	NA	NA	1.5	60	If equaled or exceeded	NA

Notes: All standards are based on measurements at 25 C and 1 atmosphere pressure.  
National standards shown are the primary (health effects) standards.  
NA = not applicable.

Source: U.S. Environmental Protection Agency and California Air Resources Board.

materials. It is a severe eye, nose, and throat irritant. Ozone also attacks synthetic rubber, textiles, plants, and other materials and can cause extensive cell damage and leaf discoloration in plants.

**Table 4.2-2.** Ozone Air Quality Monitoring Results (Mojave Monitoring Station)

	State/Federal	Ozone Concentration (ppm)		
		2002	2003	2004
Highest 1-hour average (ppm)	0.09/0.12	0.120	0.120	0.120
Highest 8-hour average (ppm)	0.07/0.08	0.10	0.10	0.09
Days > state standard		18	31	8
Days > federal 1-hour standard		0	0	0
Days > federal 8-hour standard		26	27	3

ppm = parts per million.

\* A state 8-hour ozone standard was enacted by California Air Resources Board (CARB) on April 28, 2005, and is expected to become effective in early 2006.

Source: The monitoring data are from the CARB web site at <http://www.arb.ca.gov/adam/adam.htm>.

Monitoring Data from Mojave, 923 Poole Street Monitoring Station.

#### *PM10 and PM2.5*

Health concerns associated with suspended particulate matter focus on those particles small enough to reach the lungs when inhaled. Particulates can damage human health and retard plant growth. Particulates also reduce visibility, soil buildings and other materials, and corrode materials. PM10 and PM2.5 emissions are generated by a wide variety of sources, including agricultural activities, industrial emissions, dust suspended by vehicle traffic and construction equipment, and secondary aerosols formed by reactions in the atmosphere.

The federal ambient air quality standard for particulate matter applies to two classes of particulates: PM2.5 and PM10. The federal and state standards for these particulates are as follows:

- The federal PM10 standards are 150 micrograms per cubic meter ( $\mu\text{m}^3$ ) as a 24-hour average and 50  $\mu\text{m}^3$  as an annual arithmetic mean.
- The state PM10 standards are 50  $\mu\text{m}^3$  as a 24-hour average and 20  $\mu\text{m}^3$  as an annual geometric mean.
- The federal PM2.5 standards are 15  $\mu\text{m}^3$  for the annual arithmetic mean and 65  $\mu\text{m}^3$  for the 24-hour arithmetic mean.
- The state PM2.5 standard is 12  $\mu\text{m}^3$  as an annual arithmetic mean.

**Table 4.2-3. PM10 Air Quality Monitoring Results (Mojave Monitoring Station)**

	State/Federal	PM10 Concentration ( $\mu\text{m}^3$ )		
		2002	2003	2004
Highest Concentration (ppm)	50/150	208	97	41
Days > state standard		1	2	0
Days > federal standard		1	0	0

ppm = parts per million.

$\mu\text{m}^3$  = micrograms per cubic meter.

Source: The monitoring data are from the CARB web site at  
<<http://www.arb.ca.gov/adam/cgi-bin/db2www/adamtop4b.d2w/Branch>>.

Monitoring Data from Mojave, 923 Poole Street Monitoring Station.

**Table 4.2-4. PM2.5 Air Quality Monitoring Results (Mojave Monitoring Station)**

	Federal	PM2.5 Concentration ( $\mu\text{m}^3$ )		
		2002	2003	2004
Highest Concentration (ppm)	65	31.4	23.2	17.8
Days > federal standard		0	0	0

ppm = parts per million.

$\mu\text{m}^3$  = micrograms per cubic meter.

Source: The monitoring data are from the CARB web site at  
<<http://www.arb.ca.gov/adam/cgi-bin/db2www/adamtop4b.d2w/Branch>>.

Monitoring Data from Mojave, 923 Poole Street Monitoring Station.

### Common Air Pollutants

The following is a general description of the physical and health effects of air pollutants that could be emitted from the Project or are known in the area. Certain pollutants are unlikely or known not to be emitted by the project and are so indicated.

#### *Ozone*

Ozone occurs in two layers of the atmosphere. The layer surrounding the earth's surface is the troposphere. Here, ground level or "bad" ozone is an air pollutant that damages human health, vegetation, and many common materials. It is a key ingredient of urban smog. The troposphere extends to a level about 10 miles up, where it meets the second layer, the stratosphere. The stratospheric or "good" ozone layer extends upward from about 10 to 30 miles and protects life on earth from the sun's harmful ultraviolet rays (UV-B).

Bad ozone is what is known as a photochemical pollutant. It needs reactive ROG, NO<sub>x</sub>, and sunlight. ROG and NO<sub>x</sub> are emitted from various sources throughout Kern County. In order to reduce ozone concentrations, it is necessary to control the emissions of these ozone precursors.

Significant ozone formation generally requires an adequate amount of precursors in the atmosphere and several hours in a stable atmosphere with strong sunlight.

Ozone is a regional air pollutant. It is generated over a large area and is transported and spread by wind. Ozone, the primary constituent of smog, is the most complex, difficult to control, and pervasive of the criteria pollutants. Unlike other pollutants, ozone is not emitted directly into the air by specific sources. Ozone is created by sunlight acting on other air pollutants (called precursors), specifically NO<sub>x</sub> and ROGs. Sources of precursor gases that contribute to the photochemical reaction that forms ozone number in the thousands. Common sources include consumer products, gasoline vapors, chemical solvents, and combustion products of various fuels. Originating from gas stations, motor vehicles, large industrial facilities, and small businesses such as bakeries and dry cleaners, the ozone-forming chemical reactions often take place in another location, catalyzed by sunlight and heat. High ozone concentrations can form over large regions when emissions from motor vehicles and stationary sources are carried hundreds of miles from their origins. Approximately 50 million people lived in counties with air quality levels above U.S. Environmental Protection Agency's (EPA's) health-based national air quality standard in 1994. The highest levels of ozone were recorded in Los Angeles. High levels also persist in other heavily populated areas, including the Texas Gulf Coast and much of the Northeast.

While the ozone in the upper atmosphere absorbs harmful ultraviolet light, ground-level ozone is damaging to the tissues of plants, animals, and humans, as well as to a wide variety of inanimate materials such as plastics, metals, fabrics, rubber, and paints. Societal costs from ozone damage include increased medical costs, the loss of human and animal life, accelerated replacement of industrial equipment, and reduced crop yields.

#### *Health Effects*

While ozone in the upper atmosphere protects the earth from harmful ultraviolet radiation, high concentrations of ground level ozone can adversely affect the human respiratory system. Many respiratory ailments, as well as cardiovascular disease, are aggravated by exposure to high ozone levels. Ozone also damages natural ecosystems such as forests and foothill communities and damages agricultural crops and some human-made materials such as rubber, paint, and plastics. High levels of ozone may negatively affect immune systems, making people more susceptible to respiratory illnesses like bronchitis and pneumonia. Ozone also accelerates aging, exacerbates preexisting asthma and bronchitis, and in cases of high concentrations can lead to the development of asthma in active children. Active people, both children and adults, appear to be more at risk from ozone exposure than those with a low level of activity. The elderly and those with respiratory disease are also considered sensitive populations for ozone.

People who work or play outdoors are at a greater risk for harmful health effects from ozone. Children and adolescents are also at greater risk, as they are more likely than adults to spend time engaged in vigorous activities. Research indicates that children under 12 years of age spend nearly twice as much time outdoors daily as adults. Teenagers spend at least twice as much time as adults in



active sports and outdoor activities. Also, children inhale more air per pound of body weight than adults, and they breathe more rapidly than adults. Children are less likely than adults to notice their own symptoms and avoid harmful exposures. Ozone is a powerful oxidant—it can be compared to household bleach, which can kill living cells (such as germs or human skin cells) upon contact. Ozone can damage the respiratory tract, causing inflammation and irritation, and it can induce symptoms such as coughing, chest tightness, shortness of breath, and worsening of asthma symptoms. Ozone in sufficient doses increases the permeability of lung cells, rendering them more susceptible to toxins and microorganisms. Exposure to levels of ozone above the current ambient air quality standard leads to lung inflammation and lung tissue damage and a reduction in the amount of air inhaled into the lungs. Recent evidence has, for the first time, linked the onset of asthma to exposure to elevated ozone levels in exercising children (McConnell et al. 2002). Elevated ozone concentrations also reduce crop and timber yields, damage native plants, and damage materials such as rubber, paints, fabric, and plastics (California Air Resources Board and American Lung Association of California, 2004).

### ***Particulate Matter***

Particulate matter pollution consists of very small liquid and solid particles floating in the air. Some particles are large or dark enough to be seen as soot or smoke. Others are so small they can be detected only with an electron microscope. Particulate matter is a mixture of materials that can include smoke, soot, dust, salt, acids, and metals. Particulate matter also forms when gases emitted from motor vehicles and industrial sources undergo chemical reactions in the atmosphere. PM<sub>10</sub> refers to particles less than or equal to 10 microns in aerodynamic diameter. PM<sub>2.5</sub> refers to particles less than or equal to 2.5 microns in aerodynamic diameter and are a subset of PM<sub>10</sub>.

In the western United States, there are sources of PM<sub>10</sub> in both urban and rural areas. PM<sub>10</sub> and PM<sub>2.5</sub> are emitted from stationary and mobile sources, including diesel trucks and other motor vehicles; power plants; industrial processing; wood-burning stoves and fireplaces; wildfires; dust from roads, construction, landfills, and agriculture; and fugitive windblown dust. Because particles originate from a variety of sources, their chemical and physical compositions vary widely.

### ***Health Effects***

PM<sub>10</sub> and PM<sub>2.5</sub> particles are small enough—about 1/7th the thickness of a human hair, or smaller—to be inhaled into, and lodge in, the deepest parts of the lung, evading the respiratory system's natural defenses. Health problems begin as the body reacts to these foreign particles. Acute and chronic health effects associated with high particulate levels include the aggravation of chronic respiratory diseases, heart and lung disease, and coughing, bronchitis, and respiratory illnesses in children. Recent mortality studies have shown a statistically significant direct association between mortality and daily concentrations of particulate matter in the air. Non-health-related effects include reduced visibility and soiling of buildings. PM<sub>10</sub> can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases,

and reduce the body's ability to fight infections. PM10 and PM2.5 can aggravate respiratory disease and cause lung damage, cancer, and premature death.

Although particulate matter can cause health problems for everyone, certain people are especially vulnerable to adverse health effects of PM10. These "sensitive populations" include children, the elderly, exercising adults, and those suffering from chronic lung disease such as asthma or bronchitis. Of greatest concern are recent studies that link PM10 exposure to the premature death of people who already have heart and lung disease, especially the elderly. Acidic PM10 can also damage human-made materials and is a major cause of reduced visibility in many parts of the U.S.

Premature deaths linked to particulate matter are now at levels comparable to deaths from traffic accidents and secondhand smoke. One of the most dangerous pollutants, fine particulate matter (e.g., from diesel exhaust and fireplace soot) not only bypasses the body's defense mechanisms and becomes embedded in the deepest recesses of the lung, but also can disrupt cellular processes. Population-based studies in hundreds of cities in the U.S. and around the world have demonstrated a strong link between elevated particulate levels and premature deaths, hospital admissions, emergency room visits, and asthma attacks. Long-term studies of children's health conducted in California have demonstrated that particulate pollution may significantly reduce lung function growth in children (California Air Resources Board 2002).

Attaining the California PM standards would annually prevent about 6,500 premature deaths, or 3% of all deaths. These premature deaths shorten lives by an average of 14 years. This is roughly equivalent to the same number of deaths (4,200–7,400) linked to secondhand smoke in the year 2000. In comparison, motor vehicle crashes cause 3,200 deaths, and homicides were responsible for 2,000 deaths. Attaining the California PM and ozone standards would annually prevent 4,000 hospital admissions for respiratory disease, 3,000 hospital admissions for cardiovascular disease, and 2,000 asthma-related emergency room visits. Exposure to diesel PM causes about 250 excess cancer cases per year in California. (California Air Resources Board 2002).

A recent study provides evidence that exposure to particulate air pollution is associated with lung cancer. This study found that residents who live in an area that is severely affected by particulate air pollution are at risk of lung cancer at a rate comparable to non-smokers exposed to secondhand smoke. This study also found an approximately 16 percent excess risk of dying from lung cancer attributable to fine particulate air pollution (Pope et al. 2002).

Another study shows that individuals with existing cardiac disease can be in a potentially life-threatening situation when exposed to high levels of ultra fine air pollution. Fine particles can penetrate the lungs and may cause the heart to beat irregularly or can cause inflammation, which could lead to a heart attack (Peters et al. 2001).

Currently, 61% of California's population live in areas that exceed the federal PM<sub>2.5</sub> air standard, while 89% live in areas that exceed California's PM<sub>2.5</sub> air standard (California Air Resources Board 2004).

### ***Reactive Organic Gases and Volatile Organic Compounds***

Hydrocarbons are organic gases that are formed solely of hydrogen and carbon. There are several subsets of organic gases including volatile organic compounds (VOCs) and ROGs. ROGs include all hydrocarbons except those exempted by the California Air Resources Board. Therefore, ROGs are a set of organic gases based on state rules and regulations. VOCs are similar to ROGs in that they include all organic gases except those exempted by federal law. The list of compounds exempt from the definition of VOC is included by the SJVAPCD and is presented in District Rule 1102. Both VOCs and ROGs are emitted from incomplete combustion of hydrocarbons or other carbon-based fuels. Combustion engine exhaust, oil refineries, and oil-fueled power plants are the primary sources of hydrocarbons. Another source of hydrocarbons is evaporation from petroleum fuels, solvents, dry cleaning solutions, and paint.

### ***Health Effects***

The primary health effects of hydrocarbons result from the formation of ozone and its related health effects (see ozone health effects discussion above). High levels of hydrocarbons in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen through displacement. There are no separate federal or California ambient air quality standards for ROG. Carcinogenic forms of ROG are considered toxic air contaminants (TACs). An example is benzene, which is a carcinogen. The health effects of individual ROGs are described below under the toxic air contaminants heading below.

### ***Carbon Monoxide***

CO is emitted by mobile and stationary sources as a result of incomplete combustion of hydrocarbons or other carbon-based fuels. CO is an odorless, colorless, poisonous gas that is highly reactive.

CO is a byproduct of motor vehicle exhaust, which contributes more than two-thirds of all CO emissions nationwide. In cities, automobile exhaust can cause as much as 95% of all CO emissions. These emissions can result in high concentrations of CO, particularly in areas with heavy traffic congestion. Other sources of CO emissions include industrial processes and fuel combustion in sources such as boilers and incinerators. Despite an overall downward trend in concentrations and emissions of CO, some metropolitan areas still experience high levels of CO.

### ***Health Effects***

CO enters the bloodstream and binds more readily to hemoglobin than oxygen, reducing the oxygen-carrying capacity of blood and thus reducing oxygen delivery to organs and tissues. The health threat from CO is most serious for those who suffer from cardiovascular disease. Healthy individuals are also affected, but only at higher levels of exposure. CO binds strongly to hemoglobin, the oxygen-carrying protein in blood, and thus reduces the blood's capacity for carrying oxygen to the heart, brain, and other parts of the body. Exposure to CO

can cause chest pain in heart patients, headaches, and reduced mental alertness. At high concentrations, CO can cause heart difficulties in people with chronic diseases and can impair mental abilities. Exposure to elevated CO levels is associated with visual impairment, reduced work capacity, reduced manual dexterity, poor learning ability, difficulty performing complex tasks, and in prolonged, enclosed exposure, death.

The adverse health effects associated with exposure to ambient and indoor concentrations of CO are related to concentration of carboxyhemoglobin (COHb) in the blood. Health effects observed may include early onset of cardiovascular disease, behavioral impairment, decreased exercise performance of young healthy men, reduced birth weight, Sudden Infant Death Syndrome (SIDS), and increased daily mortality rate (Fierro et al. 2001).

Most of the studies evaluating adverse health effects of CO on the central nervous system examine high-level poisoning. Such poisoning results in symptoms ranging from common flu and cold symptoms (shortness of breath on mild exertion, mild headaches, and nausea) to unconsciousness and death. Hexter and Goldsmith report an association between daily death rate and exposure to ambient CO in Los Angeles County. They postulate a concentration of 20.2 parts per million (ppm) (the highest daily concentration recorded during a 4-year period) contributed to 11 out of 159 deaths (Hexter and Goldsmith 1971). Additional studies conducted in Los Angeles and Sao Paulo also suggest a relationship between daily death rates and CO concentrations (Kinney and Ozkaynak 1991; Saldivia et al. 1995).

### ***Nitrogen Oxides***

NO<sub>x</sub> is a family of highly reactive gases that are a primary precursor to the formation of ground-level ozone and react in the atmosphere to form acid rain. NO<sub>x</sub> is emitted from the use of solvents and combustion processes in which fuel is burned at high temperatures, principally from motor vehicle exhaust and stationary sources such as electric utilities and industrial boilers. A brownish gas, nitrogen dioxide is a strong oxidizing agent that reacts in the air to form corrosive nitric acid and toxic organic nitrates.

### ***Health Effects***

NO<sub>x</sub> is an ozone precursor that combines with ROG to form ozone. NO<sub>x</sub> refers to all species of oxides of nitrogen. The most common is nitrogen dioxide (NO<sub>2</sub>). See the ozone section above for a discussion of the health effects of ozone.

Direct inhalation of NO<sub>x</sub> can also cause a wide range of health effects. NO<sub>x</sub> can irritate the lungs, cause lung damage, and lower resistance to respiratory infections such as influenza. Short-term exposures (e.g., less than 3 hours) to low levels of NO<sub>x</sub> may lead to changes in airway responsiveness and lung function in individuals with preexisting respiratory illnesses. These exposures may also increase respiratory illnesses in children. Long-term exposures to NO<sub>x</sub> may lead to increased susceptibility to respiratory infection and may cause irreversible alterations in lung structure. Other health effects associated with NO<sub>x</sub> are an increase in the incidence of chronic bronchitis and lung irritation. NO<sub>x</sub> can cause fading of textile dyes and additives, deterioration of cotton and

nylon, and corrosion of metals attributable to production of particulate nitrates. Airborne  $\text{NO}_x$  can also impair visibility.  $\text{NO}_x$  is a major component of acid deposition in California.  $\text{NO}_x$  may affect both terrestrial and aquatic ecosystems.  $\text{NO}_x$  in the air is a potentially significant contributor to a number of environmental effects such as acid rain and eutrophication in coastal waters. Eutrophication occurs when a body of water suffers an increase in nutrients that reduce the amount of oxygen in the water, producing an environment that is destructive to fish and other animal life.

$\text{NO}_2$  is toxic to various animals as well as to humans. Its toxicity relates to its ability to combine with water to form nitric acid in the eye, lung, mucus membranes and skin. Chronic exposure to nitrogen dioxide ( $\text{NO}_2$ ) may lead to eye and mucus membrane aggravation, along with pulmonary dysfunction. Studies of the health impacts of  $\text{NO}_2$  include experimental studies on animals, controlled laboratory studies on humans, and observational studies.

In animals, long-term exposure to  $\text{NO}_x$  increases susceptibility to respiratory infections, lowering their resistance to such diseases as pneumonia and influenza. Laboratory studies show susceptible humans, such as asthmatics, exposed to high concentrations of  $\text{NO}_2$  can suffer lung irritation and potentially lung damage.

Epidemiological studies have shown associations between  $\text{NO}_2$  concentrations and daily mortality from respiratory and cardiovascular causes and hospital admissions for respiratory conditions.

$\text{NO}_x$  contributes to a wide range of environmental effects directly and when combined with other precursors in acid rain and ozone. Increased nitrogen inputs to terrestrial and wetland systems can lead to changes in plant species composition and diversity. Similarly, direct nitrogen inputs to aquatic ecosystems such as those found in estuarine and coastal waters can lead to eutrophication (a condition that promotes excessive algae growth, which can lead to a severe depletion of dissolved oxygen and increased levels of toxins harmful to aquatic life). Nitrogen, alone or in acid rain, also can acidify soils and surface waters. Acidification of soils causes the loss of essential plant nutrients and increased levels of soluble aluminum that are toxic to plants. Acidification of surface waters creates conditions of low pH and levels of aluminum that are toxic to fish and other aquatic organisms.  $\text{NO}_x$  also contribute to visibility impairment. (U.S. EPA 2005).

### ***Sulfur Dioxide***

$\text{SO}_2$  is a colorless, irritating gas with a “rotten egg” smell formed primarily by the combustion of sulfur-containing fossil fuels. Historically, in the late 1970s in the San Joaquin Valley Air Basin (SJVAB) portion of Kern County,  $\text{SO}_2$  was a pollutant of concern, but with the successful application of regulations, the levels have been reduced significantly. In fact, the latest data from the California Air Resources Board (CARB) demonstrate that the highest 1-hour concentration for  $\text{SO}_2$  was 0.011 ppm. With the California ambient air quality standards (CAAQS) being 0.25 ppm,  $\text{SO}_2$  concentrations in the SJVAB are only about 4 percent of the standard.

### *Health Effects*

High concentrations of SO<sub>2</sub> can result in temporary breathing impairment for asthmatic children and adults who are active outdoors. Short-term exposures of asthmatic individuals to elevated SO<sub>2</sub> levels during moderate activity may result in breathing difficulties that can be accompanied by symptoms such as wheezing, chest tightness, and shortness of breath. Other effects that have been associated with longer-term exposures to high concentrations of SO<sub>2</sub>, in conjunction with high levels of PM, include aggravation of existing cardiovascular disease, respiratory illness, and alterations in the lungs' defenses. SO<sub>2</sub> also is a major precursor to PM<sub>2.5</sub>, which is a significant health concern and a main contributor to poor visibility. (See also the discussion of health effects of particulate matter.)

SO<sub>2</sub> not only has a bad odor, but it also can irritate the respiratory system. Exposure to high concentrations for short periods of time can constrict the bronchi and increase mucus flow, making breathing difficult. SO<sub>2</sub> can also:

- immediately irritate the lung and throat at concentrations greater than 6 ppm in many people;
- impair the respiratory system's defenses against foreign particles and bacteria, when exposed to concentrations less than 6 ppm for longer time periods; and
- enhance the harmful effects of ozone (combinations of the two gases at concentrations occasionally found in the ambient air appear to increase airway resistance to breathing).

SO<sub>2</sub> tends to have more toxic effects when acidic pollutants, liquid or solid aerosols, and particulates are also present. (In the 1950s and 1960s, thousands of excess deaths occurred in areas where SO<sub>2</sub> concentrations exceeded 1 ppm for a few days and other pollutants were also high.) Effects are more pronounced among mouth breathers, e.g., people who are exercising or who have head colds. These effects include:

- Health problems, such as episodes of bronchitis requiring hospitalization associated with lower-level acid concentrations.
- Self-reported respiratory conditions, such as chronic cough and difficult breathing, associated with acid aerosol concentrations. (Asthmatic individuals are especially susceptible to these effects. The elderly and those with chronic respiratory conditions may also be affected at lower concentrations than the general population.)
- Increased respiratory tract infections, associated with longer-term, lower-level exposures to SO<sub>2</sub> and acid aerosols.
- Subjective symptoms, such as headaches and nausea, in the absence of pathological abnormalities, attributable to long-term exposure.

SO<sub>2</sub> easily injures many plant species and varieties, both native and cultivated. Some of the most sensitive plants are various commercially valuable pines, legumes, red and black oaks, white ash, alfalfa, and blackberry. The effects include:

- Visible injury to the most sensitive plants at exposures as low as 0.12 ppm for 8 hours.
- Visible injury to many other plant types of intermediate sensitivity at exposures of 0.30 ppm for 8 hours.
- Positive benefits from low levels, in a very few species growing on sulfur-deficient soils.

Increases in SO<sub>2</sub> concentrations accelerate the corrosion of metals, probably through the formation of acids. (SO<sub>2</sub> is a major precursor to acidic deposition.) Sulfur oxides may also damage stone and masonry, paint, various fibers, paper, leather, and electrical components.

Increased SO<sub>2</sub> also contributes to impaired visibility. Particulate sulfate, much of which is derived from sulfur dioxide emissions, is a major component of the complex total suspended particulate mixture.

#### ***Other Pollutants***

The following pollutants are unlikely or known not to be emitted by the Project in quantifiable quantities. Information about these pollutants is included because these pollutants may occur from other sources in the vicinity of the project. However, the Project is not anticipated to have a measurable contribution.

- **Sulfates.** Sulfates are particulate products of combustion of sulfur-containing fossil fuels. When SO or SO<sub>2</sub> is exposed to oxygen, it precipitates out into sulfates (SO<sub>3</sub> or SO<sub>4</sub>). Data collected in Kern County identify levels of sulfates that are significantly less than the applicable health standards.

Sulfates (SO<sub>4</sub>) are the fully oxidized ionic form of sulfur. Sulfates occur in combination with metal and/or hydrogen ions. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (e.g., gasoline, diesel fuel) that contain sulfur. This sulfur is oxidized to SO<sub>2</sub> during the combustion process and subsequently converted to sulfate compounds in the atmosphere. The conversion of SO<sub>2</sub> to sulfates takes place comparatively rapidly and completely in urban areas of California because of regional meteorological features.

The CARB's sulfates standard is designed to prevent aggravation of respiratory symptoms. Effects of sulfate exposure at levels above the standard include a decrease in ventilatory function, aggravation of asthmatic symptoms, and an increased risk of cardiopulmonary disease. Sulfates are particularly effective in degrading visibility and, because they are usually acidic, can harm ecosystems and damage materials and property (California Air Resources Board 2005).

- **Lead.** Lead is a metal that is a natural constituent of air, water, and the biosphere. Lead is neither created nor destroyed in the environment, so it essentially persists forever. Lead was used until recently to increase the octane rating in auto fuel. Gasoline-powered automobile engines were a major source of airborne lead through the use of leaded fuels and the use of leaded fuel has been mostly phased out; consequently, the ambient concentrations of lead have dropped dramatically. KCAPCD and the

Antelope Valley Air Quality Management District (AVAQMD) no longer monitor lead in the ambient air of the MDAB.

Exposure to lead occurs mainly through inhalation of air and ingestion of lead in food, water, soil, or dust. It accumulates in the blood, bones, and soft tissues and can adversely affect the kidneys, liver, nervous system, and other organs. Excessive exposure to lead may cause neurological impairments such as seizures, mental retardation, and behavioral disorders. Even at low doses, lead exposure is associated with damage to the nervous systems of fetuses and young children, resulting in learning deficits and lowered IQ. Recent studies also show that lead may be a factor in high blood pressure and subsequent heart disease. Lead can also be deposited on the leaves of plants, presenting a hazard to grazing animals and humans through ingestion (U.S. EPA 2005a).

- **Hydrogen Sulfide.** Hydrogen sulfide (H<sub>2</sub>S) is associated with geothermal activity, oil and gas production, refining, sewage treatment plants, and confined animal feeding operations.

Exposure to low concentrations of hydrogen sulfide may cause irritation to the eyes, nose, or throat. It may also cause difficulty in breathing for some asthmatics. Exposure to higher concentrations (above 100 ppm) can cause olfactory fatigue, respiratory paralysis, and death. Brief exposures to high concentrations of hydrogen sulfide (greater than 500 ppm) can cause a loss of consciousness. In most cases, the person appears to regain consciousness without any other effects. However, in many individuals, there may be permanent or long-term effects such as headaches, poor attention span, poor memory, and poor motor function. No health effects have been found in humans exposed to typical environmental concentrations of hydrogen sulfide (0.00011–0.00033 ppm). Deaths attributable to breathing in large amounts of hydrogen sulfide have been reported in a variety of different work settings, including sewers, animal processing plants, waste dumps, sludge plants, oil and gas well drilling sites, and tanks and cesspools.

- **Visibility-Reducing Particles.** This standard is a measure of visibility. The CARB does not yet have a measuring method with enough accuracy or precision to designate areas in the state attainment or nonattainment. The entire state is labeled unclassified.
- **Vinyl Chloride.** Vinyl chloride monomer is a sweet-smelling, colorless gas at ambient temperature. Landfills, publicly owned treatment works, and PVC production are the major identified sources of vinyl chloride emissions in California. Polyvinyl chloride (PVC) can be fabricated into several products such as PVC pipes, pipefittings, and plastics. In humans, epidemiological studies of occupationally exposed workers have linked vinyl chloride exposure to development of a rare cancer, liver angiosarcoma, and have suggested a relationship between exposure and lung and brain cancers. There are currently no adopted ambient air standards for vinyl chloride.
- Short-term exposure to vinyl chloride has been linked with the following acute health effects (Agency for Toxic Substances and Disease Registry



1997; Agency for Toxic Substances and Disease Registry 1990; U.S. Department of Health and Human Services 1993):

- ❑ Acute exposure of humans to high levels of vinyl chloride via inhalation has resulted in effects on the central nervous system, such as dizziness, drowsiness, headaches, and giddiness.
- ❑ Vinyl chloride is reported to be slightly irritating to the eyes and respiratory tract in humans. Acute exposure to extremely high levels of vinyl chloride has caused loss of consciousness, lung and kidney irritation, and inhibition of blood clotting in humans and cardiac arrhythmias in animals.
- ❑ Tests involving acute exposure of mice have shown vinyl chloride to have high acute toxicity from inhalation exposure.
- Long-term exposure to vinyl chloride concentrations has been linked with the following chronic health effects (Agency for Toxic Substances and Disease Registry 1997; U.S. Department of Health and Human Services Registry of Toxic Effects of Chemical Substances [RTECS] online database 1993; U.S. Department of Health and Human Services 1993; U.S. Environmental Protection Agency 1997):
  - ❑ Liver damage may result in humans from chronic exposure to vinyl chloride, through both inhalation and oral exposure.
  - ❑ A small percentage of individuals occupationally exposed to high levels of vinyl chloride in air have developed a set of symptoms termed “vinyl chloride disease,” which is characterized by Raynaud’s phenomenon (fingers blanch and numbness and discomfort are experienced upon exposure to the cold), changes in the bones at the end of the fingers, joint and muscle pain, and scleroderma-like skin changes (thickening of the skin, decreased elasticity, and slight edema).
  - ❑ Central nervous system effects (including dizziness, drowsiness, fatigue, headache, visual and/or hearing disturbances, memory loss, and sleep disturbances) as well as peripheral nervous system symptoms (peripheral neuropathy, tingling, numbness, weakness, and pain in fingers) have also been reported in workers exposed to vinyl chloride.
- Several reproductive/developmental health effects from vinyl chloride exposure have been identified (Agency for Toxic Substances and Disease Registry 1990; U.S. Department of Health and Human Services Registry of Toxic Effects of Chemical Substances [RTECS] online database 1993). They include:
  - ❑ Several case reports suggest that male sexual performance may be affected by vinyl chloride. However, these studies are limited by lack of quantitative exposure information and possible co-occurring exposure to other chemicals.

- ❑ Several epidemiological studies have reported an association between vinyl chloride exposure in pregnant women and an increased incidence of birth defects, while other studies have not reported similar findings.
- ❑ Epidemiological studies have suggested an association between men occupationally exposed to vinyl chloride and miscarriages in their wives' pregnancies although other studies have not supported these findings.
- ❑ Long-term exposure to vinyl chloride has also been identified as a cancer risk (Agency for Toxic Substances and Disease Registry 1990; U.S. Department of Health and Human Services Registry of Toxic Effects of Chemical Substances [RTECS] online database 1993; U.S. Department of Health and Human Services. Hazardous Substances Data Bank [[HSDB online database](#)] 1993; U.S. Environmental Protection Agency 1997).
- **Toxic Air Contaminants.** *Hazardous air pollutants* is a term used by the federal Clean Air Act that includes a variety of pollutants generated or emitted by industrial production activities. Called TAC under the California Clean Air Act, 10 have been identified through ambient air quality data as being the most substantial health risk in California. Direct exposure to these pollutants has been shown to cause cancer, birth defects, damage to brain and nervous system, and respiratory disorders. The CARB provides emission inventories for only the larger air basins. Information on TACs is available for the San Joaquin Air Basin. Data for the MDAB are not available from the CARB inventory. The MDAB is predominantly rural and has substantially lower emissions of criteria pollutants and TACs compared to the San Joaquin Air Basin.

TACs do not have ambient air quality standards because no safe levels of TACs can be determined. Instead, TAC impacts are evaluated by calculating the health risks associated with a given exposure. The requirements of the Air Toxic "Hot Spots" Information and Assessment Act apply to facilities that use, produce, or emit toxic chemicals. Facilities that are subject to the toxic emission inventory requirements of the act must prepare, submit, and periodically update toxic emission inventory plans and reports.

### **Health Effects of the TACs**

#### ***Health Risks—Acetaldehyde***

Acetaldehyde is both directly emitted into the atmosphere and formed in the atmosphere from photochemical oxidation. Sources include combustion processes such as exhaust from mobile sources and fuel combustion from stationary internal combustion engines, boilers, and process heaters.

Acetaldehyde is classified as a federal hazardous air pollutant and as a California TAC. Acetaldehyde is a carcinogen that also causes chronic non-cancer toxicity in the respiratory system. Symptoms of chronic intoxication of acetaldehyde in humans resemble those of alcoholism. The primary acute effect of inhalation exposure to acetaldehyde is irritation of the eyes, skin, and respiratory tract in humans. At higher exposure levels, erythema, coughing, pulmonary edema, and necrosis may also occur. Acute inhalation of acetaldehyde resulted in a

depressed respiratory rate and elevated blood pressure in experimental animals. Tests involving acute exposure of rats, rabbits, and hamsters have demonstrated acetaldehyde to have low acute toxicity from inhalation and moderate acute toxicity from oral or dermal exposure (U.S. EPA 2005).

#### ***Health Risks—Benzene***

Approximately 84 percent of the benzene emitted in California comes from motor vehicles, including evaporative leakage and unburned fuel exhaust. Currently, the benzene content of gasoline is less than 1 percent.

Benzene is highly carcinogenic and occurs throughout California. Benzene also has non-cancer health effects. Brief inhalation exposure to high concentrations can cause central nervous system depression. Acute effects include central nervous system symptoms of nausea, tremors, drowsiness, dizziness, headache, intoxication, and unconsciousness (California Environmental Protection Agency and Air Resources Board 2005).

Neurological symptoms of inhalation exposure to benzene include drowsiness, dizziness, headaches, and unconsciousness in humans. Ingestion of large amounts of benzene may result in vomiting, dizziness, and convulsions in humans. Exposure to liquid and vapor may irritate the skin, eyes, and upper respiratory tract in humans. Redness and blisters may result from dermal exposure to benzene.

Chronic inhalation of certain levels of benzene causes disorders in the blood in humans. Benzene specifically affects bone marrow (the tissues that produce blood cells). Aplastic anemia, excessive bleeding, and damage to the immune system (by changes in blood levels of antibodies and loss of white blood cells) may develop. Increased incidence of leukemia (cancer of the tissues that form white blood cells) has been observed in humans occupationally exposed to benzene (U.S. EPA 2005b).

#### ***Health Risks—1,3-Butadiene***

The majority of 1,3-butadiene emissions come from incomplete combustion of gasoline and diesel fuels. Mobile sources account for 83 percent of total statewide emissions. Areawide sources such as agricultural waste burning and open burning contribute approximately 13 percent of statewide emissions.

1,3-butadiene has been identified as a carcinogen in California. At very high levels butadiene vapors cause neurological effects such as blurred vision, fatigue, headache, and vertigo. Dermal exposure of humans to 1,3-butadiene causes a sensation of cold, followed by a burning sensation, which may lead to frostbite (California Environmental Protection Agency Air Resources Air Resources Board 2005).

One epidemiological study reported that chronic (long-term) exposure to 1,3-butadiene via inhalation resulted in an increase in cardiovascular diseases, such as rheumatic and arteriosclerotic heart diseases, while other human studies have reported effects on the blood. A large epidemiological study of synthetic rubber-industry workers demonstrated a consistent association between 1,3-butadiene

exposure and occurrence of leukemia. Several epidemiological studies of workers in styrene-butadiene rubber factories have shown an increased incidence of respiratory, bladder, stomach, and lymphato-hematopoietic cancers. However, these studies are not sufficient to determine a causal association between 1,3-butadiene exposure and cancer because of possible exposure to other chemicals and other confounding factors (U.S. EPA 2005c).

#### ***Health Risks—Carbon Tetrachloride***

The primary sources of carbon tetrachloride in California include chemical and allied product manufacturers and petroleum refineries.

In California, carbon tetrachloride has been identified as a carcinogen. Carbon tetrachloride is also a central nervous system depressant and mild eye and respiratory tract irritant (California Environmental Protection Agency Air Resources Board 2005). EPA has classified carbon tetrachloride as a Group B2, probable human carcinogen (U.S. EPA 2005d).

Acute inhalation and oral exposures to high levels of carbon tetrachloride have been observed primarily to damage the liver (swollen, tender liver, changes in enzyme levels, and jaundice) and kidneys (nephritis, nephrosis, proteinuria) of humans. Depression of the central nervous system has also been reported. Symptoms of acute exposure in humans include headache, weakness, lethargy, nausea, and vomiting. Delayed pulmonary edema (fluid in lungs) has been observed in humans exposed to high levels of carbon tetrachloride by inhalation and ingestion, but this is believed to be attributable to injury to the kidney rather than direct action of carbon tetrachloride on the lung. Chronic inhalation or oral exposure to carbon tetrachloride produces liver and kidney damage in humans and animals (U.S. EPA 2005d).

#### ***Health Risks—Chromium, Hexavalent***

Chromium plating and other metal finishing processes are the primary sources of hexavalent chromium emissions in California. In California, hexavalent chromium has been identified as a carcinogen. There is epidemiological evidence that exposure to inhaled hexavalent chromium may result in lung cancer. The principal acute effects are renal toxicity, gastrointestinal hemorrhage, and intravascular hemolysis (California Environmental Protection Agency Air Resources Board).

The respiratory tract is the major target for chromium (VI) following inhalation exposure in humans. Other effects noted from acute inhalation exposure to very high concentrations of chromium (VI) include gastrointestinal and neurological effects, while dermal exposure causes skin burns in humans. Chronic inhalation exposure to chromium (VI) in humans results in effects on the respiratory tract, with perforations and ulcerations of the septum, bronchitis, decreased pulmonary function, pneumonia, asthma, and nasal itching and soreness reported. Chronic human exposure to high levels of chromium (VI) by inhalation or oral exposure may produce effects on the liver, kidney, gastrointestinal and immune systems, and possibly the blood (U.S. EPA 2005e).

***Health Risks—Para-Dichlorobenzene***

The primary sources of para-dichlorobenzene include consumer products such as non-aerosol insect repellents and solid/gel air fresheners. These sources contribute 99% of statewide para-dichlorobenzene emissions.

In California, para-dichlorobenzene has been identified as a carcinogen. Acute exposure to 1,4-dichlorobenzene via inhalation in humans results in irritation to the eyes, skin, and throat. In addition, long-term inhalation exposure may affect the liver, skin, and central nervous system in humans (e.g., cerebellar ataxia, dysarthria, weakness in limbs, and hyporeflexia) (California Environmental Protection Agency Air Resources Air Resources Board 2005; U.S. EPA 2005f).

***Health Risks—Formaldehyde***

Formaldehyde is both directly emitted into the atmosphere and formed in the atmosphere as a result of photochemical oxidation. Formaldehyde is a product of incomplete combustion. One of the primary sources of formaldehyde is vehicular exhaust. Formaldehyde is also used in resins, can be found in many consumer products as an antimicrobial agent, and is used in fumigants and soil disinfectants.

The major toxic effects caused by acute formaldehyde exposure via inhalation are eye, nose, and throat irritation and effects on the nasal cavity. Other effects seen from exposure to high levels of formaldehyde in humans are coughing, wheezing, chest pains, and bronchitis. Chronic exposure to formaldehyde by inhalation in humans has been associated with respiratory symptoms and eye, nose, and throat irritation. Animal studies have reported effects on the nasal respiratory epithelium and lesions in the respiratory system from chronic inhalation exposure to formaldehyde. Occupational studies have noted statistically significant associations between exposure to formaldehyde and increased incidence of lung and nasopharyngeal cancer. This evidence is considered to be “limited,” rather than “sufficient,” because of possible exposure to other agents that may have contributed to the excess cancers. EPA considers formaldehyde to be a probable human carcinogen and has ranked it in EPA’s Group B1. In California, formaldehyde has been identified as a carcinogen. (California Environmental Protection Agency Air Resources Air Resources Board 2005; U.S. EPA 2005g.)

***Health Risks—Methylene Chloride***

Methylene chloride is used as a solvent, a blowing and cleaning agent in the manufacture of polyurethane foam and plastic manufacture, and as a solvent in paint-stripping operations. Paint removers account for the largest use of methylene chloride in California.

Case studies of methylene chloride poisoning during paint stripping operations have demonstrated that inhalation exposure to extremely high levels can be fatal to humans. Acute inhalation exposure to high levels of methylene chloride in humans has resulted in effects on the central nervous system, including decreased visual, auditory, and psychomotor functions, but these effects are reversible once exposure ceases. Methylene chloride also irritates the nose and throat at high concentrations. The major effects from chronic inhalation exposure to methylene

chloride in humans are effects on the central nervous system, such as headaches, dizziness, nausea, and memory loss. In addition, chronic exposure can lead to bone marrow, hepatic, and renal toxicity. EPA considers methylene chloride to be a probable human carcinogen and has ranked it in EPA's Group B2. California considers methylene chloride to be carcinogenic. (U.S. EPA 2005h.)

#### ***Health Risks—Perchloroethylene***

Perchloroethylene is used as a solvent, primarily in dry cleaning operations. Perchloroethylene is also used in degreasing operations, paints and coatings, adhesives, aerosols, specialty chemical production, printing inks, silicones, rug shampoos, and laboratory solvents.

In California, perchloroethylene has been identified as a carcinogen. Perchloroethylene vapors are irritating to the eyes and respiratory tract. Following chronic exposure, workers have shown signs of liver toxicity, as well as kidney dysfunction, and neurological disorders (California Environmental Protection Agency Air Resources Board 2005).

#### ***Health Risks—Diesel Particulate Matter***

Diesel particulate matter is emitted from both mobile and stationary sources. In California, on-road diesel-fueled engines contribute approximately 24 percent of the statewide total, with an additional 71 percent attributed to other mobile sources such as construction and mining equipment, agricultural equipment, and transport refrigeration units. Stationary sources contribute about 5 percent of total diesel particulate matter.

Diesel exhaust and many individual substances contained in it (including arsenic, benzene, formaldehyde, and nickel) have the potential to contribute to mutations in cells that can lead to cancer. Long-term exposure to diesel exhaust particles poses the highest cancer risk of any TAC evaluated by the California Office of Environmental Health Hazard Assessment (OEHHA). CARB estimates that about 70 percent of the cancer risk that the average Californian faces from breathing toxic air pollutants stems from diesel exhaust particles.

In its comprehensive assessment of diesel exhaust, OEHHA analyzed more than 30 studies of people who worked around diesel equipment, including truck drivers, railroad workers, and equipment operators. The studies showed these workers were more likely to develop lung cancer than workers who were not exposed to diesel emissions. These studies provide strong evidence that long-term occupational exposure to diesel exhaust increases the risk of lung cancer. Using information from OEHHA's assessment, CARB estimates that diesel-particle levels measured in California's air in 2000 could cause 540 "excess" cancers (beyond what would occur if there were no diesel particles in the air) in a population of 1 million people over a 70-year lifetime. Other researchers and scientific organizations, including the National Institute for Occupational Safety and Health, have calculated cancer risks from diesel exhaust that are similar to those developed by OEHHA and CARB.

Exposure to diesel exhaust can have immediate health effects. Diesel exhaust can irritate the eyes, nose, throat, and lungs, and it can cause coughs, headaches,

lightheadedness, and nausea. In studies with human volunteers, diesel exhaust particles made people with allergies more susceptible to the materials to which they are allergic, such as dust and pollen. Exposure to diesel exhaust also causes inflammation in the lungs, which may aggravate chronic respiratory symptoms and increase the frequency or intensity of asthma attacks.

Diesel engines are a major source of fine-particle pollution. The elderly and people with emphysema, asthma, and chronic heart and lung disease are especially sensitive to fine-particle pollution. Numerous studies have linked elevated particle levels in the air to increased hospital admissions, emergency room visits, asthma attacks, and premature deaths among those suffering from respiratory problems. Because children's lungs and respiratory systems are still developing, they are also more susceptible than healthy adults to fine particles. Exposure to fine particles is associated with increased frequency of childhood illnesses and can also reduce lung function in children. In California, diesel exhaust particles have been identified as a carcinogen (California Office of Environmental Health Hazard Assessment and the American Lung Association 2005; California Environmental Protection Agency Air Resources Board 2005).

### **Kern County Air Pollution Control District and Antelope Valley Air Quality Management District**

The CARB has divided the state geographically into 15 air basins according to topographic features. The proposed Project lies within the MDAB. In the Project vicinity, the MDAB is bordered by the SJVAB to the north and the South Coast Air Basin to the south. The majority of the land uses for the proposed Project are located within the Kern County portion of the MDAB. Construction activities for delivery pipelines will also occur in a portion of the MDAB regulated by AVAQMD.

The State also is divided into air pollution control districts and air quality management districts. The recharge and recovery facilities would be located in the KCAPCD, which covers the eastern half of Kern County, which is bordered by Inyo County to the north, San Bernardino County to the east and Los Angeles County to the south. Most of the new delivery pipeline would be located in the AVAQMD. AVAQMD is bordered by the Kern County line on the north, the San Gabriel Mountains to the south, the San Bernardino County line to the east, and the Sierra Nevada on the west. Wind speed and direction play an important role in dispersion and transport of air pollutants. Ozone and inhalable particulates (PM10 and PM2.5) are classified as regional pollutants because they can be transported away from the emission source before concentrations peak. In contrast, local pollutants such as CO tend to have their highest concentrations near the source of emissions. These local pollutants dissipate easily and therefore have highest concentrations during low wind speeds.

During the summer, wind speed and direction data indicate that summer winds usually originate at the north end of the MDAB and flow in a south-southeasterly direction into the South Coast Air Basin. During the winter, wind speed and direction data indicate that winds occasionally originate from the south end of the

MDAB and flow in a north-northwesterly direction. Also, during winters, the MDAB experiences light, variable winds, typically less than 10 miles per hour. Low wind speeds, combined with low inversion layers in the winter, create a climate conducive to high CO and inhalable particulate (PM10) concentrations.

## **Local**

### **Sensitive Receptors**

A sensitive receptor is an individual who is more susceptible to the effects of air pollution than the population at large. Sensitive receptors generally include children and elderly individuals. Sensitive receptors in the Project area include scattered residences. There are no hospitals or elderly care facilities in the Project area.

## **Regulatory Framework**

### **Federal Regulations**

The primary legislation that governs federal air quality regulations is the Clean Air Act, which delegates primary responsibility for ensuring clean air to the EPA. The EPA develops rules and regulations to preserve and improve air quality and delegate specific responsibilities to state and local agencies.

The EPA has NAAQS for criteria pollutants (Table 4.2-1). Criteria pollutants include CO, NO<sub>2</sub>, SO<sub>2</sub>, ozone, PM10, and lead.

If an area does not meet the NAAQS shown in Table 4.2-1, federal clean air planning requirements specify that states must develop and adopt SIPs, which are air quality plans that show how air quality standards will be attained. In California, the EPA has delegated the authority to prepare SIPs to the CARB, which, in turn, has delegated that authority to individual air districts.

The Project is located within a federal nonattainment area for ozone and PM10. The KCAPCD has adopted a SIP that addresses PM10, ozone, and the ozone precursors (NO<sub>x</sub> and ROGs). The SIP specifies that regional air quality standards for ozone and PM10 concentrations can be met through additional source controls and through trip reduction strategies. The SIP also establishes emissions budgets for transportation and stationary sources. Those budgets, developed through air quality modeling, reveal how much air pollution can be in an area before there is a violation of the NAAQS.

AVAQMD adopted an Ozone Attainment Plan in 2004. This plan describes how the AVAQMD will meet the federal attainment standards for ozone by the required year of 2007.



## State

The CARB, which is part of the California Environmental Protection Agency, develops air quality regulations at the state level. The state regulations mirror federal regulations by establishing industry-specific pollution controls for criteria, toxic, and nuisance pollutants. California also requires areas to develop plans and strategies for attaining state ambient air quality standards as set forth in the California Clean Air Act of 1988 (Table 4.2-1).

The CARB is also responsible for developing motor vehicle emission standards for California vehicles. In August 1998, CARB identified particulate emissions from diesel-fueled engines (diesel PM) as toxic air contaminants. In September 2000, CARB approved a comprehensive diesel risk-reduction plan to reduce emissions from both new and existing diesel-fueled engines and vehicles. The goal of the plan is to reduce diesel PM10 emissions and the associated health risk by 75 percent in 2010 and by 85 percent by 2020. The plan identifies 14 measures that CARB will implement over the next several years. To the extent that the CARB measures are enacted before any phase of construction, the proposed Project would be required to comply with applicable diesel control measures.

## Local

### Kern County

#### *Kern County Air Pollution Control District*

The KCAPCD California Clean Air Act Ozone Air Quality Attainment Plan was approved by the CARB in 1993. The KCAPCD is in attainment with the NAAQS 1-hour ozone standard. However, the NAAQS 8-hour and the CAAQS ozone standards have not been met.

The KCAPCD is responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws. The proposed program may be subject to the following District rules. In addition, the program may be subject to additional rules.

- **Rule 210.1 (New and Modified Stationary Source Review Rule):** This rule applies to all new stationary sources and all modifications of existing stationary sources that are subject to the District permit requirements and after construction emit or may emit one or more affected pollutant.
- **Rule 202 (Exemptions, Permits):** This rule exempts home fireplaces, motor vehicles, repairs to and maintenance of existing structures, and portable engines.
- **Rule 201.1 (Permits to Operate for Sources Subject to Title V of the Federal Clean Air Act):** This rule is intended to implement requirements of Title V of the Federal Clean Air Act, which requires certain sources emitting air pollutants.

- **Rule 423 (National Emission Standards for Hazardous Air Pollutants):** This rule applies to any portion of an existing building that will be renovated, partially demolished, or removed. Prior to any demolition activity, an asbestos survey of existing structures on the project site may be required to identify the presence of any asbestos-containing building material (ACBM). Any identified ACBM having the potential for disturbance must be removed by a certified asbestos contractor in accordance with CAL-OSHA requirements.
- **Rule 401 (Visible Emissions):** This rule prohibits emissions of visible air contaminants to the atmosphere and applies to any source operation that emits or may emit air contaminants.
- **Rule 419 (Nuisance):** This rule applies to any source operation that emits or may emit air contaminants or other materials. In the event that the project or construction of the project creates a public nuisance, it could be in violation and be subject to SJVAPCD enforcement action.
- **Rule 427 (Stationary Piston Engines; Oxides of Nitrogen):** This rule limits the emissions of NO<sub>x</sub>, CO, and VOC from internal combustion engines. These limits are not applicable to standby engines as long as they are used fewer than 200 hours per year (e.g., for testing during non-emergencies).
- **Rule 402 (Fugitive Dust):** This rule is designed to reduce PM10 emissions (predominantly dust/dirt) generated by human activity, including construction, road construction, bulk materials storage, landfill operations, etc.

### **Kern County General Plan**

The Kern County General Plan, adopted on June 15, 2004, contains the following policies and implementation measures concerning air quality.

#### ***Land Use/Conservation/Open Space Element***

##### ***Air Quality***

##### ■ **Policies**

- In considering discretionary projects for which an Environmental Impact Report must be prepared pursuant to the California Environmental Quality Act, the appropriate decision making body, as part of its deliberations, will ensure that:
  - All feasible mitigation to reduce significant adverse air quality impacts have been adopted; and
  - The benefits of the proposed project outweigh any unavoidable significant adverse effects on air quality found to exist after inclusion of all feasible mitigation. This finding shall be made in a statement of overriding considerations and shall be supported by factual evidence to the extent that such a statement is required pursuant to the California Environmental Quality Act.
- The County shall include fugitive dust control measures as a requirement for discretionary projects and as required by the adopted rules and

regulations of the San Joaquin Valley Unified Air Pollution Control District and the Kern County Air Pollution Control District on ministerial permits.

- ❑ The County shall support air districts efforts to reduce PM10 and PM2.5 emissions.
- ❑ Kern County shall continue to work with the San Joaquin Valley Unified Air Pollution Control District and the Kern County Air Pollution Control District toward air quality attainment with federal, state, and local standards.
- ❑ The County shall continue to implement the local government control measures in coordination with the Kern Council of Governments and the San Joaquin Valley Unified Air Pollution Control District.

■ **Implementation Measures**

- ❑ All discretionary permits shall be referred to the appropriate air district for review and comment.
- ❑ Discretionary project may use one or more of the following to reduce air quality effects:
  - Pave dirt roads within the development.
  - Pave outside storage areas.
  - Provide additional low Volatile Organic Compounds (VOC) producing trees on landscape plans.
  - Use of alternative fuel fleet vehicles or hybrid vehicles.
  - Use of emission control devices on diesel equipment.
  - Develop residential neighborhoods without fireplaces or with the use of Environmental Protection Agency certified, low emission natural gas fireplaces.
  - Provide bicycle lockers and shower facilities on site.
  - Increasing the amount of landscaping beyond what is required in the Zoning Ordinance (Chapter 19.86).
  - The use and development of park and ride facilities in outlying areas.
  - Other strategies that may be recommended by the local Air Pollution Control Districts.
- ❑ The County should include PM10 control measures as conditions of approval for subdivision maps, site plans, and grading permits.

**Willow Springs Specific Plan**

The following are a relevant goal, policy, and mitigation/implementation measures from the WSSP.

***Air Quality*****■ Goal**

- Imposition of appropriate mitigation measures to reduce where practical to do so, the effect short-term and long-term projects have on the area which involve grading activities, erosion controls, revegetation of disturbed sites, and provisions to introduce into the plan area a competitive job market to reduce travel times.

**■ Policy**

- Compliance with the Mitigation/Implementation Measures and enactment of an approved Air Quality Attainment Plan.

**■ Mitigation/Implementation Measures**

- To mitigate potential dust generation impacts, the Willow Springs Specific Plan Update project shall comply with applicable County regulations (to the satisfaction of the Kern County Air Pollution Control District), which require specific dust control measures.
- During construction, all grading activities shall be ceased during periods of high winds (i.e., greater than 30 mph). To assure compliance with this measure, grading activities are subject to periodic inspections by County staff.
- Construction equipment shall be fitted with the most modern emission control devices and be kept in proper tune. Motors out of proper tune can result in emissions that vastly exceed recommended standards.
- The project applicants shall, to the extent feasible, implement applicable control measures contained in the Attainment Plan in effect at the time of adoption of this Specific Plan, by the Air Pollution Control District in 1991.
- All phases of the Willow Springs Specific Plan Update shall comply with applicable rules and regulations of the Kern County Air Pollution Control District.

**Los Angeles County*****Antelope Valley Air Quality Management District***

The AVAQMD adopted an Ozone Attainment Plan in 2004. This plan describes how the AVAQMD will meet the federal attainment standards for ozone by the required year of 2007. The plan also describes how Antelope Valley will make significant progress towards attainment of the CAAQS by 2007 as well.

The AVAQMD is responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws. The proposed Project would result in construction activity only in the AVAQMD. Therefore, the local rules that would apply have been summarized.

- Rule 401 (Visible Emissions):** This rule prohibits emissions of visible air contaminants to the atmosphere and applies to any source operation that emits or may emit air contaminants.

- **Rule 402 (Nuisance):** This rule applies to any source operation that emits or may emit air contaminants or other materials. In the event that the project or construction of the project creates a public nuisance, it could be in violation and be subject to SJVAPCD enforcement action.
- **Rule 403 (Fugitive Dust):** The purpose of this rule is to reduce the amount of dust/dirt generated by human activity, including construction, road construction, bulk materials storage, landfill operations, etc.

### **General Plan**

The following are a relevant goal and policy from the Los Angeles County General Plan.

#### *Air Quality*

##### ■ **Goal**

- To support local efforts to improve air quality.

##### ■ **Policy**

- Actively support strict air quality regulations for mobile and stationary sources, and continued research to improve air quality. Promote vanpooling, carpooling, and improved public transportation.

### **Antelope Valley Areawide General Plan**

The following is a relevant policy from the Antelope Valley Areawide General Plan.

#### *Environmental Resource Management*

##### *Natural Resources*

##### ■ **Policy**

- Promote air quality that is compatible with health, well-being, and enjoyment of life. The public nuisance, property and vegetative damage, and deterioration of aesthetic qualities that result from air pollution contaminants should be prevented to the greatest degree possible.

## **Impact Analysis**

This section describes the CEQA impact analysis relating to air quality for the proposed Project. It describes the methods used to determine the proposed Project's impacts and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion.

## Approach and Methodology

### Construction Impact Assessment Methods

Construction of the Project would generate emissions of ROG, NO<sub>x</sub>, CO, oxides of sulfur (SO<sub>x</sub>), and PM10. Construction-related emissions also would include fugitive PM10 dust from site grading and exhaust emissions resulting from worker commute trips and off-road construction equipment. Emissions from off-road construction equipment are estimated based on the CARB's off-road model (<http://www.arb.ca.gov/msci/off-road/updates.html>). Fugitive dust emission factors are based on research done by the Midwest Research Institute for the South Coast Air Quality Management District (Midwest Research Institute 1996).

The Project is proposed to be constructed in two phases. Phase 1 would involve construction of only the recharge and recovery facilities connecting to the AVEK West Feeder. This would allow the owner/operator to operate the recharge and recovery facilities within the current capacity of the AVEK West Feeder. It is anticipated that Phase 1 facilities would be constructed throughout 2006.

Phase 2 would involve connecting the recharge and recovery facilities to the California Aqueduct by means other than the AVEK West Feeder in order to increase the total capacity of the Project. This would be accomplished by constructing a new pipeline, approximately 8.75 miles long, parallel to the existing LAA #2 alignment. Phase 2 construction would commence after at least 1 year of Phase 1 operation and would require 6 to 12 months to complete.

The grading and site preparation for the recharge and recovery facilities would use the largest amount of heavy-duty construction equipment and would be the highest source of emissions during construction.

Other construction activities such as site preparation, construction of access roads, and construction of ancillary facilities would also involve the use of heavy equipment. However, the type and number of pieces of equipment and the intensity of construction and associated emissions would be less than the worst-case phase selected for analysis. Based on Chapter 3, "Project Description," the following estimates were made concerning required construction equipment; the numbers and types of equipment may vary. The grading activity is estimated to involve four excavators, four graders, one scraper, two tractors, and up to five water trucks used for controlling dust and conveying compaction water. The actual number of water-spreading pieces of equipment would depend on how much compaction water could be directly applied through hoses and pipes. The construction of pipelines and ditches would also involve the use of one crane, four rubber-tired dozers, and three trenchers. In addition to the emissions associated with operation of construction equipment, worker commute trips would contribute a small amount of emissions.

## Visibility-Reducing Particulate Analysis

Both KCAPCD and AVAQMD have fugitive dust regulations, visibility regulations, and recommended construction mitigation measures to reduce fugitive dust off site. The proposed Project is not immediately adjacent to a Wilderness Area, and compliance with these regulations would minimize off-site emissions. Visibility-reducing particulate matter would not occur off site. No visibility analysis was warranted for this project based on the distance to the closest wilderness and the requirement for compliance with the applicable regulations.

The Edwards Air Force Base low flight zone encompasses part of the Project area. This area is not a Class I area, and a visibility analysis is not required. The Project would not reasonably be expected to cause a reduction in visibility for Edwards Air Force Base or the Edwards Air Force Base low flight zone. A detailed visibility analysis was not prepared for the Project because the Project does not have sufficient emissions to warrant such an analysis and the Project is not close to Class I areas. Based on total project emissions, the formation of secondary NO<sub>x</sub> particles and visibility-reducing particles would not be reasonably expected to degrade visibility.

## Odor Analysis

The Project does not include any known sources of objectionable odors. In addition, there are no sensitive receptors in proximity to proposed Project features. Because of the lack of odor sources and the distance to the nearest receptor, a detailed odor analysis was not warranted for this project.

## Operational Impact Assessment Methods

Operation emissions for the Project include both indirect mobile source emissions and direct stationary source emissions. Emissions from mobile sources associated with operation of the Project would be generated by workers commuting to and from the workplace. However, because the Project would employ only a few workers (generally less than current farming operations), the emissions associated with commute trips would be negligible. Based on the project description, fewer than 20 trips are anticipated to be associated with operation of the proposed project.

The Project may use electric motors or propane engines to drive pumps on wells and lift stations. For the purposes of this analysis, it was assumed that propane engines are used and that direct emissions from these stationary sources would occur. The primary operational emissions associated with the Project are expected to include PM10 and ozone precursors (ROG and NO<sub>x</sub>) emitted as internal combustion engine exhaust. Operational emissions of ozone precursors and PM10 were estimated using emission calculations based on emission factors from the EPA AP-42 Emissions Factors.

Information on the estimated size and number of engines for wells and lift station pumps was provided by WDS. The worst-case engine horsepower requirements were used to estimate Project emissions for the purposes of this analysis. Comparing worst-case emissions to the significance threshold ensures that all significant impacts are disclosed. However, actual or average emissions would likely be substantially lower than the worst-case emissions scenario.

## Thresholds of Significance

The Kern County CEQA Implementation Document and Kern County Environmental Checklist state that a project would have a significant impact on air quality, if it would:

- conflict with or obstruct implementation of the applicable air quality plan;
- violate any air quality standard as adopted in (c)i, (c)ii, or as established by EPA or air district or contribute substantially to an existing or projected air quality violation; or
- result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors). Specifically, if implementation of the project would exceed any of the following adopted thresholds:

- Kern County Air Pollution Control District:

### Operational and Area Sources

- Reactive Organic Gases (ROG) 25 tons per year.
- Oxides of Nitrogen (NO<sub>x</sub>) 25 tons per year.
- Particulate Matter (PM10) 15 tons per year.

### Stationary Sources - determined by District Rules

- 25 tons per year.
- Expose sensitive receptors to substantial pollutant concentrations.
- Create objectionable odors affecting a substantial number of people.<sup>[EIS]</sup>

## Antelope Valley Air Quality Management District

AVAQMD has CEQA thresholds similar to KCAPCD. AVAQMD considers a project to have a significant impact if it:

- Generates total emissions (direct and indirect) exceeding the following thresholds:
  - CO 100 tons per year;



- ❑ VOCs 25 tons per year;
- ❑ NO<sub>x</sub> 25 tons per year;
- ❑ SO<sub>x</sub> 25 tons per year;
- ❑ particulate matter (PM10) 15 tons per year; and/or
- generates a violation of any ambient air quality standard when added to the local background; and/or,
- does not conform with the applicable attainment or maintenance plan(s); and/or
- exposes sensitive receptors to substantial pollutant concentrations, including those resulting in a cancer risk greater than or equal to 1 in a million and/or a Hazard Index (HI) (non-cancerous) greater than or equal to 0.1.

## Impacts and Mitigation Measures

### Impact 4.2-1: Short-Term Increase in PM10 Emissions from Construction Activities

The Project is proposed to be constructed in two phases. Phase 1 would involve construction of only the recharge and recovery facilities connecting to the AVEK West Feeder. It is anticipated that Phase 1 facilities would be constructed throughout 2006. Phase 1 grading would require the movement of approximately 942,442 cubic yards of soil in a single year. The total disturbed area in a single year for Phase 1 would be approximately 1,612 acres. Grading would be balanced on site in order to eliminate the need to haul additional fill material to the site or to haul excess material off site. Active construction for Phase 1 is expected to last only 6 months.

Phase 2 would involve connecting the recharge and recovery facilities to the California Aqueduct by means other than the AVEK West Feeder in order to increase the total capacity of the Project. This would be accomplished by constructing a new pipeline, approximately 8.75 miles long, parallel to the existing LAA #2 alignment. Phase 2 construction activities are expected to have a total disturbed area of 161.5 acres. Based on the maximum equipment mix listed in Table 4.2-5 and a construction rate of 400 feet per day, construction would take 116 days of active construction. Phase 2 construction would not occur in the same year as Phase 1 construction but could occur in the same year that Phase 1 operations occur. Phase 2 construction would require up to 12 months to complete. These construction activities are expected to involve multiple pieces of heavy construction equipment, which are listed in Table 4.2-5.

The information shown in Table 4.2-5 was used to estimate construction-related emissions during peak construction days. The construction emissions estimates are considered to represent worst-case emissions. Actual construction emissions would be expected to be well below the emissions estimated because the

maximum construction equipment mix would not operate each and every day of construction.

**Table 4.2-5.** Estimated Amount and Types of Heavy Equipment To Be Used for Mass Grading During Peak Construction Activities

Equipment Type	Maximum Number
Trenchers	3
Excavators	4
Grader	4
Rubber tired Dozers	4
Scraper	1
Tractors	2
Crane	1
Water trucks	5

Operation of the heavy equipment listed would result in exhaust emissions of ROG, NO<sub>x</sub>, CO, and PM10, whereas fugitive PM10 dust would be emitted by activities that disturb the soil, such as grading and excavation. Emission estimates are based on a fugitive dust emission factor developed for construction activities in California. Actual fugitive dust emissions may differ based on variations in soil type, wind, and soil moisture. Estimated daily air pollutant emissions during onsite grading and construction of recharge and recovery facilities are shown in Table 4.2-6.

**Table 4.2-6.** Maximum Annual Construction Emissions for the Proposed Project (tons/year)

Emission Source	ROG	NO <sub>x</sub>	CO	PM10
Phase 1 Construction Emissions On-site heavy equipment (including fugitive dust and worker trips)	3.56	21.49	30.17	11.88
Phase 2 Construction Emissions On-site heavy equipment (including fugitive dust and worker trips)	2.27	19.27	13.73	0.98
Significance Threshold (tons/year)	25	25	100	15

Construction activities would generate fugitive dust and exhaust PM10. Sources of fugitive dust and PM10 include:

- excavating soils,
- loading the excavated material onto trucks,

- tracking dirt onto paved surfaces,
- generating truck exhaust, and
- dust blowing in the wind.

The Project emissions are below the significance threshold for an individual project. The Project impact is considered less than significant. The contribution of these emissions to a cumulative impact is considered in a separate impact analysis below, where the emissions are considered a significant impact because they could contribute substantially to an existing air quality violation (i.e., the MDAB is classified as a nonattainment area). Control measures for construction emissions of PM10 are recommended by the KCAPCD for land preparation and/or demolition and are required by Regulation 402 of the district. Similar measures would also be required for the portions of construction in AVAQMD, and construction activities occurring in the AVAQMD portion of the MDAB would be subject to AVAQMD Regulation 403.

**Mitigation Measure:**

***Mitigation Measure 4.2-1:*** The following dust control measures will be implemented:

- All material excavated or graded will be sufficiently watered to prevent excessive dust. Watering will occur as needed with complete coverage of disturbed areas. Watering will occur a minimum of twice daily on unpaved/untreated roads and on disturbed areas with active operations.
- All clearing, grading, earth moving and excavation activities will cease during periods when dust plumes of 20 percent or greater opacity affect public roads or occupied structures.
- All material transported off site will be either sufficiently watered or securely covered to prevent excessive dust.
- If more than 5,000 cubic yards of fill material will be imported or exported from the site, then all haul trucks will be required to exit the site via an access point where a gravel pad or grizzly has been installed.
- Areas disturbed by clearing, earth moving or excavation activities will be minimized at all times.
- Stockpiles of dirt or other fine loose material will be stabilized by watering or other appropriate method to prevent wind-blown fugitive dust.
- Where acceptable to the fire department, weed control will be accomplished by mowing instead of discing, thereby leaving the ground undisturbed and with a mulch covering.
- All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.
- Traffic speeds on unpaved roads shall be limited to 25 mph.

**Mitigation Measure 4.2-2:** During all grading and construction activities at least 10 percent of diesel engine–driven construction equipment on site shall be equipped with Tier 1 or Tier 2 as certified by CARB or with engines certified by the applicable air district (KCAPCD or AVAQMD) to provide equivalent benefits. At least 40 percent of the remaining diesel engine–driven construction equipment shall have diesel particulate filters and lean-NO<sub>x</sub> catalyts (or equivalent control devices).

**Mitigation Measure 4.2-3:** The owner/operator will require that all diesel engines be shut off when not in use to reduce emissions from idling.

**Level of Significance after Mitigation:** Less than significant.

### **Impact 4.2-2: Increase in Pollutant Emissions as a Result of Operation and Maintenance**

Operation of the Project would require pumping at wells and lift stations to deliver water to users. For the purpose of this analysis, WDS has conservatively assumed that all new pump locations would be propane powered. All recovery pumps and lift stations would be located in the KCAPCD. Propane-fueled internal combustion engines that exceed 50 horsepower would require a permit from the KCAPCD. These new engines would be subject to KCAPCD rules and regulations and would have to meet best available control technology (BACT) standards. All engines greater than 50 horsepower would need to meet the emission limitations published in the CARB BACT clearinghouse. Therefore, the emission estimates for Project operations that are compared to the significance threshold are the controlled engine emission estimates. Emissions above this level would not be expected to occur because they would not comply with the applicable BACT guideline. In addition, the owner/operator may elect to use electric pumps at wellhead or lift station locations; if the proposed propane-powered pumps were replaced with electricity-driven pumps, the engines would not contribute any operational emissions.

For the purposes of this analysis, it was assumed that use of the engines could occur up to 24 hours per day for up to 203 days, for a total operating time of 4,872 hours per year. The emission estimate uses the worst-case scenario of 17 engines at wells and a booster pump at the lift station, for a combined total of 10,386 horsepower in Phase 1. Phase 2 adds equipment to the pumps and lift stations installed during Phase 1. Phase 2 would involve a worst-case scenario of 40 propane-powered engines at wells and up to 4 booster pumps at the lift stations, for a combined total of 17,569 horsepower. As shown in Table 4.2-7, normal operation of the propane-fueled engines with emission-control devices that meet BACT guidelines are not expected to generate NO<sub>x</sub> or ROG emissions in excess of the KCAPCD threshold of 25 tons per year or PM10 emissions in excess of 15 tons per year. Therefore, the controlled Project emissions are less than the significance threshold. As a result, this impact is considered less than significant.

**Table 4.2-7. Project-Related Emissions from Operations (tons per year)**

	ROG	NO <sub>x</sub>	CO	PM10
Phase 1 Controlled emissions from internal combustion engines at wells and lifts/stations	8.4	8.4	33.4	1.1
Phase 2 Controlled emissions from internal combustion engines at wells and lifts/stations (additional equipment not captured in Phase 1)	5.8	5.8	23.2	0.8
Total project emission from operations (Phase 1 and Phase 2 equipment)	14.1	14.1	56.6	1.9
2 KCAPCD thresholds	25	25	100	15

Notes: Estimate assumes a combined total of 10,386 horsepower for Phase 1 and 17,579 horsepower for Phase 2.

Estimate assumes engine operating time of 4,872 hours per year.

Emission factors based on CARB BACT Clearinghouse (SJVAPCD BACT Guideline 3.3.12 (San Joaquin Valley Air Pollution Control District 2002)).

This emissions estimate is based on a worst-case scenario of all engines operating on propane fuel and pessimistic assumptions for the maximum number of engines required. In the event that a combination of propane- and electricity-powered engines is used or fewer engines are required, the emissions would be reduced.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

## Cumulative Impacts

### **Impact 4.2-3: Result in a Cumulatively Considerable Net Increase of Any Criteria Pollutant for Which the Project Region Is in Nonattainment under an Applicable Federal or State Ambient Air Quality Standard (Including Releasing Emissions That Exceed Quantitative Thresholds for Ozone Precursors)**

The Project site is located in the MDAB, where air quality conditions are regulated by KCAPCD. Portions of the construction will occur in the jurisdiction of the AVAQMD.

The emissions would be cumulatively significant if, with mitigation, there remains any increase in a pollutant for which the MDAB is classified as a nonattainment area. The MDAB is in nonattainment for ozone and PM10.

Because construction and operations would result in emissions of ozone precursors (ROG and NO<sub>x</sub>) and PM10, and could result in the cumulative net increase in these pollutants, impacts of Project construction and operation emissions could be cumulatively significant. Since construction would not be long-term, construction of the Project would not contribute on a long-term basis to the air pollution problems in the basin. However, the Project would have a considerable contribution to the background concentrations during construction. While implementation of the proposed mitigation measures would reduce the overall emissions, the emissions would not be reduced to a level of no net increase. In addition, although the operation emissions are below the significance threshold, the contribution to the cumulative air quality problem is not reduced to a less-than-significant level or a no-net-increase level.

This cumulative impact analysis uses a tiered approach to provide the reader with a thorough understanding of local, regional, and valleywide air quality conditions and the proposed Project's contribution to cumulative air quality impacts.

#### **Project-Specific Emissions**

As described in the project-specific discussion, construction and operation of the project, with mitigation, would still generate air emissions. These emissions do not exceed the project-specific threshold and are less than significant on a project basis when compared to the individual project thresholds. The proposed Project still has a measurable increase in ROG, NO<sub>x</sub>, and PM10 in an area that is designated as nonattainment. Projects that have a considerable contribution to a nonattainment area, meaning the project emissions are not fully mitigated or reduced to zero emissions increase would be considered to have a significant cumulative air quality impact. Consequently, the proposed project would have a significant cumulative impact based on its estimated level of air emissions after mitigation.

The proposed project has three emissions scenarios that represent the maximum emissions during any given year. The first scenario is Phase 1, construction alone. Project operations would not occur in conjunction with Phase 1 construction. The second scenario is Phase 1 operation combined with Phase 2 construction. In the event that this scenario did occur, the maximum combined emissions would occur for 1 year. The final scenario is total project emissions from operation of Phase 1 and Phase 2 equipment or full buildout operations. The maximum combined annual emissions for each potential scenario are listed in Table 4.2-8. Each scenario represents emissions for a single year, and the scenarios should not be combined for comparisons to KCAPCD thresholds but rather represent independent maximum scenarios for the project. The KCAPCD has established two independent thresholds of significance—one for operational (e.g., vehicle trips) and area sources (e.g., construction) and another for stationary sources (e.g., recovery wells and lift stations). Because of these two independent thresholds, construction emissions and operation emissions from stationary sources should not be combined for comparison to a single threshold.

**Table 4.2-8.** Summary of Annual Project-Related Emissions from Construction and/or Operations (tons per year)

	ROG	NO <sub>x</sub>	CO	PM10
Phase 1 construction emissions	3.56	21.49	30.17	11.88
Phase 1 operation combined with Phase 2 construction emissions	10.67	27.67	47.13	3.0
Total project emission from operations (Phase 1 and Phase 2)	14.1	14.1	56.6	1.9

Cumulative impacts are assessed not based solely on the relative amount of impact resulting from a proposed project compared to existing environmental problems caused by past projects, but rather whether the additional impact associated with the project should be considered significant in light of the serious nature of existing problems and projections. As described in the setting section, the MDAB is nonattainment for both ozone and PM10.

Tables 4.2-9a through 4.2-9c show the ROG, NO<sub>x</sub>, and PM10 emissions inventory projections for 2020 generated by the CARB for the Kern County portion of the MDAB (Table 4.2-9a) and for the MDAB (Table 4.2-9b). Table 4.2-9c compares the cumulative emissions impact of the Project (Phase 2) to emissions within Kern County and throughout the MDAB.

**Table 4.2-9a.** Emission Inventory Kern County—Mojave Desert Air Basin 2005 Projection (Tons per Year)

	ROG	NO <sub>x</sub>	PM10
Total emissions	13,797	14,053	11,790
Percent stationary sources	5.0%	53.0%	10.5%
Percent area wide sources	5.0%	0.8%	66.3%
Percent mobile sources	23.3%	42.9%	10.5%
Percent natural sources	66.7%	3.4%	12.7%
Total stationary source emissions	694	7,446	1,241
Total area wide source emissions	694	110	7,811
Total mobile source emissions	3,212	6,023	1,241
Total natural source emissions	9,198	475	1,497

Note: Emissions inventories have been adjusted from tons per day to tons per year by multiplying by 365.

Source: California Air Resource Board 2005

**Table 4.2-9b.** Emission Inventory Mojave Desert Air Basin 2005 Projection (Tons per Year)

	ROG	NO <sub>x</sub>	PM10
Total emissions	40,150	83,330	64,058
Percent stationary sources	15.1%	53.0%	13.8%
Percent area wide sources	13.6%	0.8%	76.6%
Percent mobile sources	35.5%	45.0%	4.1%
Percent natural sources	35.8%	1.2%	5.5%
Total stationary source emissions	6,059	44,129	8,833
Total area wide source emissions	5,475	657	49,093
Total mobile source emissions	14,235	37,486	2,628
Total natural source emissions	14,381	1,022	3,504



**Table 4.2-9c.** 2005 Emissions Projections: Antelope Valley Water Bank Project, Kern County, and Mojave Desert Air Basin (Tons per Year)

	ROG	NO <sub>x</sub>	PM10
Antelope Valley Water Bank	8.4	8.4	1.1
Kern County	13,797	14,053	11,790
Antelope Valley Water Bank percent of Kern County	0.061%	0.060%	0.009%
Mojave Desert Air Basin (MDAB)	40,150	83,330	64,058
Antelope Valley Water Bank percent of MDAB	0.021%	0.010%	0.002%
Kern County percent of MDAB	34.4%	17%	18%

Notes: The emission estimates for Kern County and MDAB are based on 2005 projections. The project's emission estimates are for Phase 1. Total project emissions including Phase 2 equipment and emissions are compared to 2020 future emissions inventories below in Table 4.2-10c.

Tables 4.2-10a through 4.2-10c show the ROG, NO<sub>x</sub>, and PM10 emissions inventory for 2005 generated by the CARB for the Kern County portion of the MDAB (Table 4.2-10a) and for the MDAB (Table 4.2-10b). Table 4.2-10c compares the cumulative emissions impact of the Project (Phase 1 only) to emissions within Kern County and throughout the MDAB based on cumulative basin emissions for 2005.

**Table 4.2-10a.** Emission Inventory Kern County—Mojave Desert Air Basin 2020 Projection (Tons per Year)

	ROG	NO <sub>x</sub>	PM10
Total emissions	13,104	13,359	12,228
Percent stationary sources	6.4%	69.7%	12.8%
Percent area wide sources	6.1%	0.8%	64.8%
Percent mobile sources	70.2%	26.2%	10.1%
Percent natural sources	17.3%	3.6%	12.2%
Total stationary source emissions	840	9,308	1,570
Total area wide source emissions	803	110	7,921
Total mobile source emissions	9,198	3,504	1,241
Total natural source emissions	2,263	475	1,497

**Table 4.2-10b.** Emission Inventory Mojave Desert Air Basin 2020 Projection (Tons per Year)

	ROG	NO <sub>x</sub>	PM10
Total emissions	37,267	80,227	71,212
Percent stationary sources	21.0%	68.1%	15.7%
Percent area wide sources	18.5%	0.9%	75.4%
Percent mobile sources	22.0%	29.8%	4.0%
Percent natural sources	38.6%	1.3%	4.9%
Total stationary source emissions	7,811	54,604	11,206
Total area wide source emissions	6,899	694	53,692
Total mobile source emissions	8,213	23,908	2,847
Total natural source emissions	14,381	1,022	3,504

**Table 4.2-10c.** 2020 Emissions Projections: Antelope Valley Water Bank Project, Kern County, and Mojave Desert Air Basin (Tons per Year)

	ROG	NO <sub>x</sub>	PM10
Antelope Valley Water Bank	14.100	14.100	1.900
Kern County	13,104	13,359	12,228
Antelope Valley Water Bank percent of Kern County	0.11%	0.11%	0.02%
Mojave Desert Air Basin	37,267	80,227	71,212
Antelope Valley Water Bank percent of MDAB	0.038%	0.018%	0.003%
Kern County percent of MDAB	35.162%	16.652%	17.171%

Notes: The emission estimates for Kern County and MDAB are based on 2020 projections. The project's emission estimates are for the expected buildout year of 2020. Project operations include all emissions from both Phase 1 and Phase 2.

The emission inventories for the MDAB and Kern County are generated by the CARB based on transportation conformity data and projected growth rates for the various areas. These projections are conservative as they include only emissions reductions from rules already adopted. Table 4.2-9c compares the estimated Project emissions to MDAB and Kern County emissions. As shown in Table 4.2-9c, the Project would have a very minor contribution to the total emissions inventory. The Project emissions would account for 1/100 of 1 percent of the total emissions in the MDAB and approximately 1/10 of 1 percent of the Kern County emissions in the MDAB. Although the Project contributions to the total inventory are relatively small, the Project does have a measurable effect on a nonattainment area and contributes emissions of ROG, NO<sub>x</sub> and PM10 to areas already in nonattainment.

### **Consistency with Applicable Air Quality Management Plans and Ozone Attainment Plan**

A project is non-conforming if it conflicts with or delays implementation of any applicable attainment or maintenance plan. A project is conforming if it complies with all applicable District rules and regulations, complies with all proposed control measures that are not yet adopted from the applicable plan(s), and is consistent with the growth forecasts in the applicable plan(s) (or is directly included in the applicable plan). Conformity with growth forecasts can be established by demonstrating that the project is consistent with the land use plan that was used to generate the growth forecast.

The KCAPCD California Clean Air Act Ozone Air Quality Attainment Plan was approved by the CARB in 1993. The KCAPCD has adopted a SIP that addresses PM10, ozone, and the ozone precursors (NO<sub>x</sub> and ROG<sub>s</sub>). The SIP specifies that regional air quality standards for ozone and PM10 concentrations can be met through additional source controls and through trip reduction strategies. The applicable rules and regulations from the SIP are listed above in the regulatory setting. The SIP also establishes emissions budgets for transportation and stationary sources. Through compliance with the adopted rules and regulations and consistency with the local land use plans, the project would comply with the applicable Clean Air Plans for KCAPCD.

The AVAQMD adopted an Ozone Attainment Plan in 2004. The 2004 plan describes how the AVAQMD will meet the federal attainment standards for ozone by the required year of 2007.

The proposed project would be consistent with the applicable ozone attainment plan for the MDAB. The project would comply with all applicable regulations in the adopted plans and would not contribute emissions in excess of thresholds used in the development of emission budgets for the attainment plans.

### **Project's Relation to Kern Council of Governments' Latest Transportation Conformity Determination**

Another approach to evaluating a project's contribution to cumulative impacts involves examining whether the project has been included in the air quality conformity modeling conducted for Kern County. Air quality conformity is a process whereby transportation plans, programs, and projects are evaluated to determine whether they conform to requirements of the 1990 federal Clean Air Act amendments and the applicable state implementation plan (SIP). This analysis is typically conducted for transportation projects and large development with substantial trip generation. The proposed project does not fall into either of these categories and has limited trip generation of approximately 10 trips per day in the a.m. or p.m. peak hour.

The Kern Council of Governments (COG), as the Metropolitan Planning Organization {MPO} and Regional Transportation Planning Authority (RTPA) for the Kern County area, is required to publish an air quality conformity analysis with the adoption or amendment of every federal transportation improvement program (FTIP) and regional transportation plan. The FTIP for the Kern region is a 4-year schedule of proposed transportation improvements.

Each FTIP prepared by the Kern COG must be modeled for conformance with air quality standards. The modeling must demonstrate that the transportation projects included in the FTIP generate air emissions that are equal to or less than the motor vehicle emissions budget for Kern County. If emissions are within the budget, the FTIP is a conforming transportation program. If emissions exceed Kern County's budget, the FTIP would be considered nonconforming, which implies a possible loss of federal funding and approvals.

The transportation conformity criteria and procedures use the latest planning assumptions and emissions models. The Kern COG regional travel model uses land use, socioeconomic, and road network data to estimate facility-specific transit and roadway traffic volumes. The Kern COG transportation model covers all of Kern County.

The most recent Kern County conformity analysis was prepared in March 2005 for the federally approved 2004 FTIP and the Destination 2030 RTP. Changes to the federal air quality standards for ozone from a 1-hour averaging period to an 8-hour period triggered the need for the new conformity analysis. The analysis demonstrates that the criteria specified in the federal transportation conformity rule for a conformity determination are satisfied by the TIP and RTP. The TIP and RTP have been shown to be conforming plans because their associated emissions are within Kern County's mobile-source emissions budget. This was determined by using the Kern County traffic model to generate estimates of vehicle miles traveled (VMT) and trips. VMT and trips, in turn, were processed using the CARB BURDEN and EMFAC models to forecast emissions of ROG, NO<sub>x</sub>, and PM10, which were found to be less than the emission budget or baseline emissions for ROG, NO<sub>x</sub>, and PM10.

The proposed Project does not add housing or employment in excess of the projections included in the Kern County conformity analysis. The Project operations would involve minimal new trips and would not substantially alter traffic patterns in the Project area. Consequently, the Project would be considered consistent with the most recent Kern County conformity analysis and would not involve cumulative air quality impacts associated with transportation or growth that have not already been included in a conformity analysis.

#### **Project List Approach: Proposed Projects near Antelope Valley Water Bank**

Another cumulative analysis for air quality involves evaluating the contribution of the proposed project combined with other proposed projects in the area or air basin. A list of projects for consideration in this analysis is included below. Each of these projects was evaluated to determine whether the combined contribution would be a significant cumulative impact.

**Table 4.2-11. Relevant Cumulative Projects**

Case Number (if applicable)	Project Name	Project Location	Project Type	Comments
<b>Kern County</b>				
GPA 1, Map 218	Tejon Mountain Village Specific Plan	East of I-5 in the hills north and east of Castaic Lake; northeast of the project site	Residential/commercial development	3,450 homes, 160,000-square foot commercial
GPA, Map 255	Lebec Canyon Estates	East of Frazier Mountain Park Road/I-5 interchange	Residential development	32 single-family residences on 1,000 acres
SPA 8, Map 254, Amend. Zone Map 254, Zone Change 6, SP 1, Map 254, Vesting Tent. Tract 6436	Frazier Park Estates	Southern boundary of Kern Co. and portion of LA County, west of I-5 south of Frazier Mountain Park Road	Residential / Commercial development	846-acre site
GPA to 5.7, Map 215	Christine Bower	One quarter mile west of 105 <sup>th</sup> Street and McConnell Road; north of the Willow Springs Specific Plan	General Plan Amendment and Zone Change for 4 single family dwelling units	20-acre site
ZC to A-1, Map 231	Julien and Assoc.	8684 Sweetser Road, Rosamond	Commercial greenhouses	60-acre site, APN 315-081-09
<b>Los Angeles County</b>				
	Centennial Specific Plan	1 mile east of I-5, adjacent to SR-138, and southeast of project site	Large-scale new community; residential/commercial/retail	23,000 dwelling units and 14 million square feet of commercial
	Gorman Ranch development	Terminus of Gorman Post Road, north of SR-138, east of I-5, southeast of project site	Single-family residential	227 single-family residences

The Tejon Mountain project is located 14 miles away from the proposed Project. The majority of the plan area (more than 90%) of the development is located in the San Joaquin Valley Air Basin. The Tejon Mountain project would not be expected to contribute to the project's contribution to the MDAB. The Tejon Mountain project would not be considered in the cumulative impacts of the proposed Project due to its the distance and location in another air basin with separate air quality guidelines and plans.

The Lebec Estates project is located 22 miles away from the proposed Project. This proposed development is also located in the San Joaquin Valley Air Basin. This project would not be expected to contribute to the projects cumulative air quality impact in the MDAB. The Lebec Estates project would not be considered

in the cumulative impacts of the proposed Project due to its the distance and location in another air basin with separate air quality guidelines and plans.

The Frazier Park project is located 24 miles away from the proposed Project. This proposed development is located in the San Joaquin Valley Air Basin. This project would not be expected to contribute to the projects cumulative air quality impact in the MDAB. The Frazier Park project would not be considered in the cumulative impacts of the proposed Project due to its the distance and location in another air basin with separate air quality guidelines and plans.

The Gorman Ranch project is located approximately 17 miles away from the proposed Project. This proposed development is located in the South Coast Air Basin. This project would not be expected to contribute to the projects cumulative air quality impact in the MDAB. The Gorman Ranch project would not be considered in the cumulative impacts of the proposed Project due to its the distance and location in another air basin with separate air quality guidelines and plans.

The Centennial project is located approximately 12 miles away from the proposed Project. This proposed development is also located in both the South Coast Air Basin and the MDAB. This project could have substantial emissions that exceed the individual project significance thresholds and would have a quantifiable or considerable contribution of NO<sub>x</sub>, ROG, and PM10 that would add to the proposed Project's contribution.

The Brower and Julien projects are located in the MDAB and in closer proximity to the proposed Project than the other projects on the list. Emissions from the Brower and Julien projects could combine with emissions from the proposed Project and contribute to a cumulative air quality impact. The Brower and Julien projects, however, would not be expected to have substantial emissions and would not exceed the individual project significance thresholds. Only minimal trip generation and emissions would be expected. Nonetheless, the Brower and Julien projects could have a quantifiable or considerable contribution of NO<sub>x</sub>, ROG, and PM10 that would add to the proposed Project's contribution.

The proposed Project in combination with other proposed and planned projects in the MDAB would contribute emissions of NO<sub>x</sub>, ROG, and PM10 emissions to an area in nonattainment for ozone and PM10. These emissions would be considered a considerable contribution to a cumulative impact.

## **Feasible and Reasonable Mitigation**

CEQA requires that all feasible and reasonable mitigation be applied to the project to reduce the impacts from construction and operations on air quality. Implementation of Mitigation Measures 4.2-1 through 4.2-3 would reduce emissions of PM10 associated with construction by requiring dust control measures during construction. Emissions of ROG and NO<sub>x</sub> from construction equipment will be further reduced by requiring that at least 10 percent of the diesel engine-driven construction equipment on site have cleaner engines with 40

percent of the remaining engines to have enhanced control devices. Emissions of PM<sub>10</sub>, ROG, and NO<sub>x</sub> associated with operations would be reduced by the BACT emission-control devices described for the propane-fuel engine or by the use of electric engines, which will eliminate emissions. No other reasonable or feasible mitigation has been identified that will reduce impacts to air quality for the project.

Despite the reduction in potential emissions achievable through implementation of emission control and mitigation measures, the Project will nonetheless result in a net increase in PM<sub>10</sub>, ROG, and NO<sub>x</sub> to a basin in nonattainment. There are no feasible control measures to reduce total project emissions to a no-net-increase level. The cumulative air quality impact is considered significant and unavoidable.

**Mitigation Measures:** Implementation of Mitigation Measures 4.2-1 through 4.2-3.

**Level of Significance after Mitigation:** Significant and Unavoidable.

## 4.3 Biological Resources

### Introduction

This section of the environmental impact report (EIR) addresses the impacts on biological resources associated with construction and operation of the proposed Project. The biological resources section describes the existing conditions of the site and the regulatory setting, and discusses the impacts of the Project and feasible mitigation measures to reduce impacts.

The proposed Project would be constructed in two phases. Phase 1 would involve construction of only the recharge and recovery facilities connecting to the AVEK West Feeder. Phase 2 would involve connecting the recharge and recovery facilities to the California Aqueduct by means other than the Antelope Valley East Kern Water District (AVEK) West Feeder, to increase the total capacity of the Project. This would be accomplished by constructing the previously mentioned new delivery pipeline, approximately 8.75 miles long, parallel to the existing Los Angeles Aqueduct (LAA) #2 alignment.

### Concepts and Terminology

#### Special-Status Species

Special-status species are plants, animals, and fish species that are legally protected under the California Endangered Species Act (CESA), the federal Endangered Species Act (ESA), or other regulations—as well as species considered sufficiently rare by the scientific community to qualify for such listing. Special-status species include:

- species listed or proposed for listing as threatened or endangered under ESA (50 Code of Federal Regulations [CFR] 17.12 [listed plants], 50 CFR 17.11 [listed animals], and various notices in the Federal Register [FR] [proposed species]);
- species that are candidates for possible future listing as threatened or endangered under ESA (69 FR 24876, May 4, 2004);
- species listed or proposed for listing by the State of California as threatened or endangered under CESA (14 CCR 670.5);
- species that meet the definitions of rare or endangered under CEQA (CEQA Guidelines Section 15380);
- plants listed as rare under the California Native Plant Protection Act (California Fish and Game Code Section 1900 et seq.);
- plants considered by the California Native Plant Society (CNPS) to be “rare, threatened, or endangered in California” (Lists 1B and 2, CNPS 2001);



- plants listed by CNPS as plants about which more information is needed to determine their status, and plants of limited distribution (Lists 3 and 4, CNPS 2001), which may be included as special-status species on the basis of local significance or recent biological information;
- animal species of special concern to the California Department of Fish and Game (DFG) ; or
- animals fully protected in California (California Fish and Game Code Section 3511 [birds], 4700 [mammals], and 5050 [amphibians and reptiles]).

## Environmental Setting

### Existing Conditions

Information about existing biological resources within and adjacent to the Project area was obtained from a reconnaissance field survey of the Project area on July 18, 2005, and review of the California Natural Diversity Database (CNDDDB) records (CNDDDB 2005) for the Liebre Twins, Tylerhorse Canyon, Willow Springs, Soledad Mountain, Rosamond, Little Buttes, Fairmont Butte, Neenach School, Burnt Peak, Lake Hughes, Del Sur, Lancaster West, Sleepy Valley, Green Valley, and Warm Springs Mountain USGS 7.5-minute quadrangles (Appendix D), and lists of special-status wildlife and plants species with potential to occur in the Project area and vicinity from the U.S. Fish and Wildlife Service (USFWS) Sacramento and Ventura offices (also in Appendix D). A description of the habitat types, special-status species, and regulatory setting is provided below.

### General

The Project is located in the western Antelope Valley in eastern Kern County and northern Los Angeles County. The Project lies on the floor of the Antelope Valley, a semi-arid region with gently sloping land that borders the Mojave Desert. Much of the Antelope Valley is currently under cultivation with various agricultural plant species with limited natural open space. There are no perennial surface water features. Several ephemeral streams flow into the Antelope Valley from the San Gabriel Mountains to the south and the Tehachapi Mountains to the north.

### Habitat Types

Habitat types present in the Project area include agricultural areas, annual grasslands, rabbitbrush scrub, ephemeral drainages, and Joshua tree woodland. Each of the habitat types is described briefly below. Of these habitats, ephemeral drainages and Joshua tree woodland are considered sensitive habitats. Figures

4.3-1a and b, located at the end of this section, depict the location and give the acreage of the habitat types within the Project area.

Habitat types are based on the *Department of Fish and Game Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986). The wildlife species listed are those commonly found in these habitats, not necessarily those that were observed by Jones & Stokes biologists.

## Agricultural Areas

Agricultural areas are the only habitat type present in the area proposed for the recharge and recovery facilities. Agricultural areas are not present along the alignment of the proposed new delivery pipeline (Figures 4.3-1a and b). Crops present within the agricultural areas currently (2005) include winter wheat, carrots, and onions. Agricultural ditches and basins are associated with the agricultural areas. Surveys conducted by Jones & Stokes, however, found that there are no wetlands associated with these water features, which are surrounded by agricultural fields and fed by irrigation water. Ornamental trees are planted densely along some of the fields to provide a wind block.

Wildlife species commonly associated with agricultural lands include mourning dove (*Zenaidura macroura*), American crow (*Corvus brachyrhynchos*), Brewer's blackbird (*Euphagus cyanocephalus*), and many species of rodents. Some species such as mountain plovers (*Charadrius mongolus*) and long-billed curlews (*Numenius americanus*) can depend on unharvested grains left in fields after harvest and on insects. Raptor species occurring in the Antelope Valley (e.g., Swainson's hawk [*Buteo swainsoni*], white-tailed kite [*Elanus leucurus*], and western burrowing owl [*Athene cunicularia*]) use agricultural habitats for nesting or foraging. Many bat species forage for insects that congregate over agricultural fields.

## Annual Grassland

Annual grassland habitat type is present along margins of the agricultural fields and also along the new delivery pipeline. This habitat type supports a large percentage of nonnative grass and forb species. In addition to the nonnative species composition, areas near roadsides exhibit low levels of diversity and are dominated by a few grasses and invasive weeds. Dominant grasses include soft chess (*Bromus hordeaceus*), red brome (*Bromus madritensis* ssp. *rubens*), cheatgrass (*Bromus tectorum*), ripgut brome (*Bromus diandrus*), Bermuda grass (*Cynodon dactylon*), wild oats (*Avena barbata*), Italian ryegrass (*Lolium multiflorum*), and tall fescue (*Festuca arundinaceae*). Common nonnative forbs include black mustard (*Brassica nigra*), Italian thistle (*Carduus pycnocephalus*), prickly lettuce (*Lactuca serriola*), yellow star-thistle (*Centaurea solstitialis*), Russian thistle (*Salsola tragus*), redstem filaree (*Erodium cicutarium*), and crane's bill geranium (*Geranium dissectum*). These species tend to colonize quickly and are typical indicators of previous disturbance.

Annual grasslands are used by a large variety of wildlife species. Reptiles that commonly occur in annual grassland habitats include western fence lizard (*Sceloporus occidentalis*), California horned lizard (*Phrynosoma coronatum frontale*), western rattlesnake (*Crotalus atrox*), and gopher snake (*Pituophis melanoleucus*). Mammals typically found in this habitat include California vole (*Microtus californicus*), western harvest mouse (*Reithrodontomys megalotis*), California ground squirrel (*Spermophilus beecheyi*), black-tailed hare (*Lepus californicus*), coyote (*Canis latrans*), and American badger. Burrowing owls, western meadowlarks (*Sturnella neglecta*), and horned larks (*Eremophila alpestris*) are birds that commonly breed in annual grasslands. Annual grasslands provide foraging habitat for a number of bird species such as red-tailed hawks (*Buteo jamaicensis*) and turkey vultures (*Cathartes aura*), and loggerhead shrikes (*Lanius ludovicianus*).

### **Rabbitbrush Scrub**

Rabbitbrush scrub is the dominant habitat type along the new delivery pipeline and is also present to the north of the recharge and recovery facilities area. This community is dominated by rubber rabbit brush (*Chrysothamnus viscidiflorus*) with a small percentage of annual grassland associates (Holland 1986).

Wildlife species commonly associated with annual grassland habitat also would utilize rabbitbrush scrub habitat.

### **Joshua Tree Woodland**

Joshua tree woodland is present in one condensed area along the new delivery pipeline in Los Angeles County. It is characterized by an open overstory of Joshua trees (*Yucca brevifolia*) with little-to-no herbaceous understory for much of the year. In spring, many species of ephemeral herbs may germinate following sufficient late fall or winter rains and flower in mid-spring.

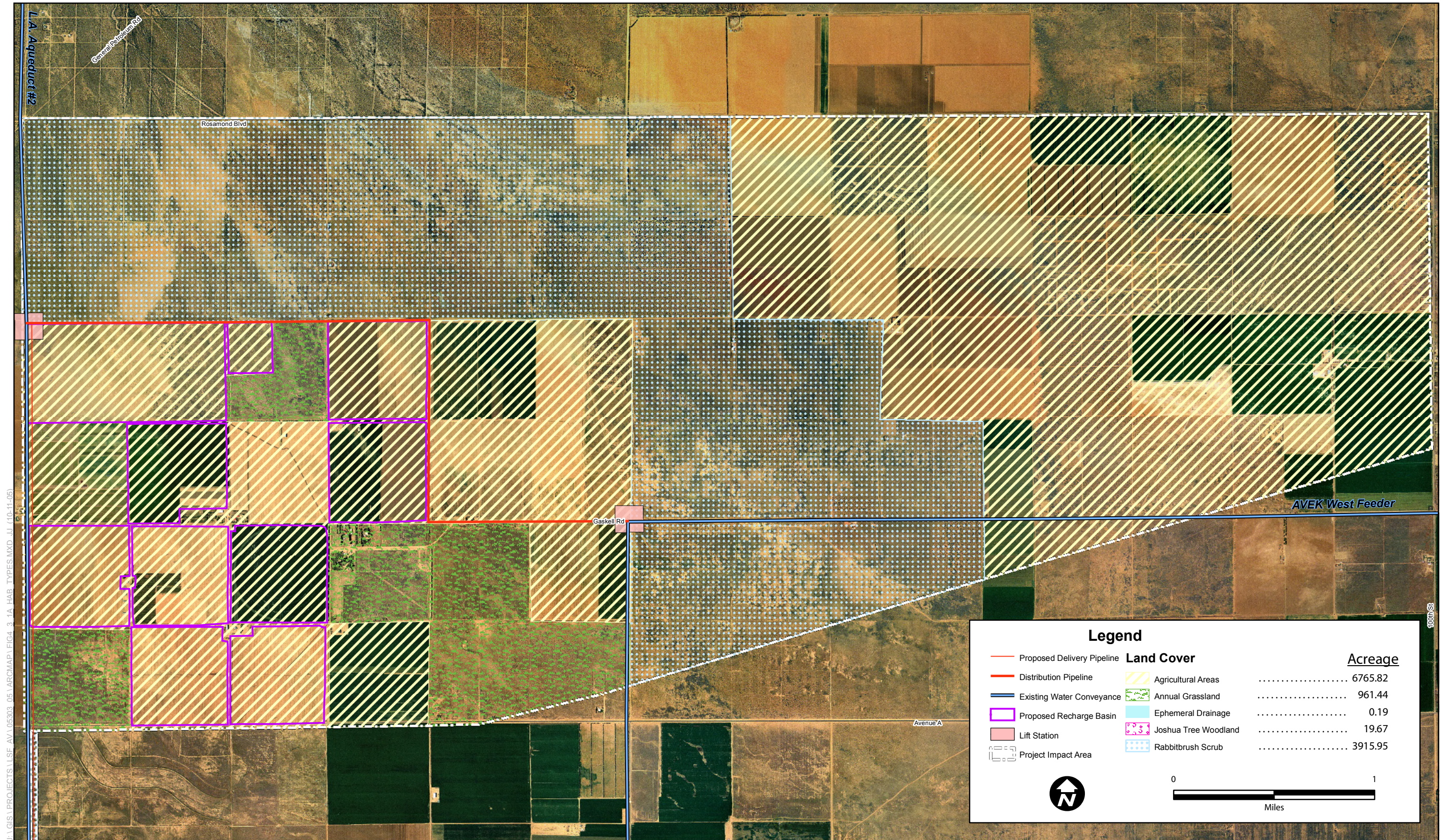
Wildlife species commonly associated with annual grassland habitat and rabbitbrush scrub habitat would also use Joshua tree woodland habitat. Dense Joshua tree woodland habitat does not provide suitable foraging habitat for raptor species.

Joshua tree woodland is characterized as an SEA by the County of Los Angeles and therefore may be subject to regulation by the county. SEAs are explained in detail within the local government regulatory section below (under Section 4.3.2.5, "Regulatory Framework").

### **Ephemeral Drainages**

During the field surveys, three ephemeral drainages were identified along the new delivery pipeline alignment (Figure 4.3-1b) in Los Angeles County. The

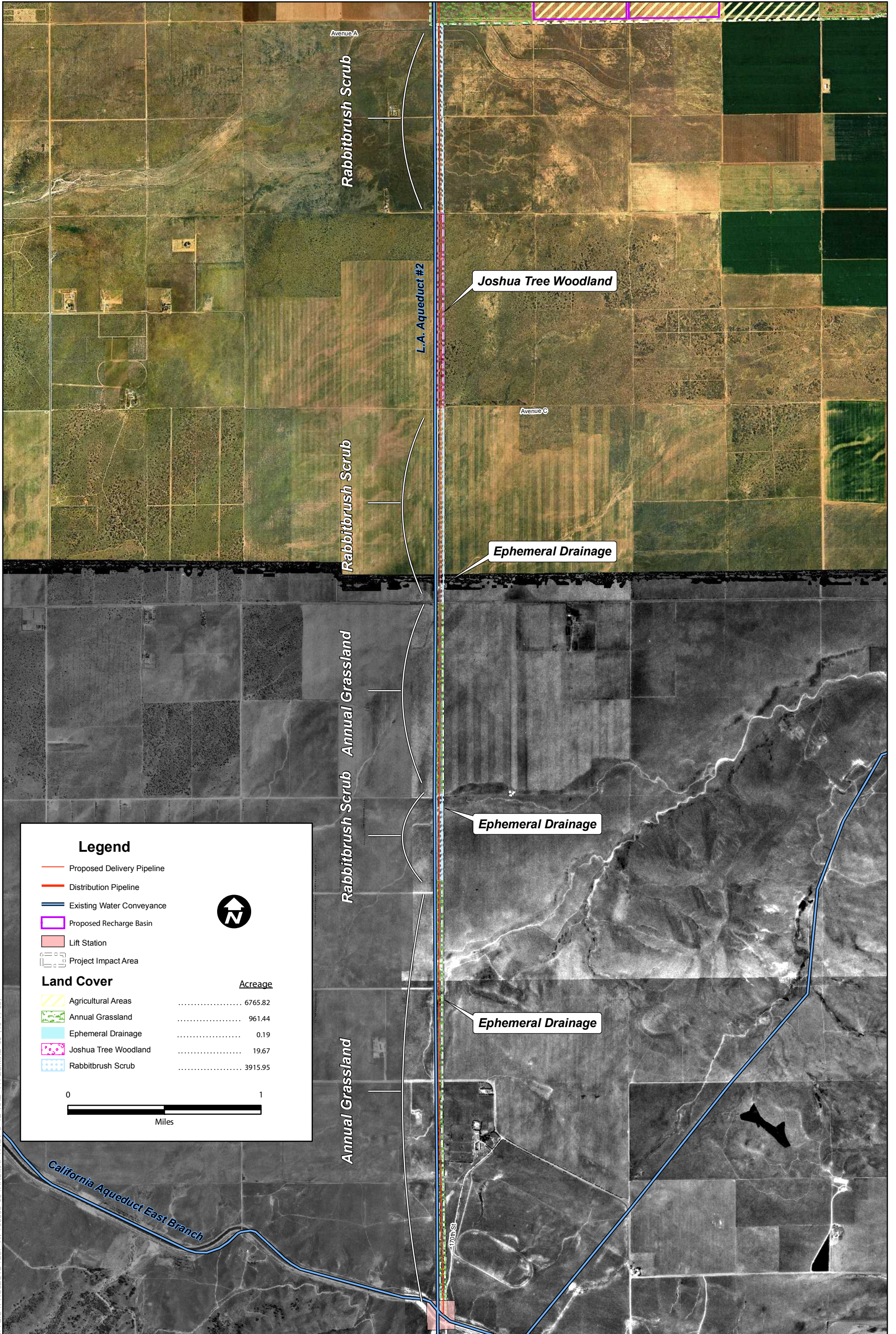




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**Figure 4.3-1a**  
**Habitat Types**  
**Antelope Valley Water Bank Project**





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drainages were identified based on the presence of a shallow bed and bank and evidence of seasonal flow in the form of scour. No wetland or riparian vegetation is associated with the drainages in the Project area.

The ephemeral drainages are characterized by a shallow bed and bank but appear to be isolated waters that would not qualify as waters of the United States, and therefore would not be subject to regulation by the U.S. Army Corps of Engineers (Corps) under Sections 401 and 404 of the federal Clean Water Act. Aaron Allen from the Corps Ventura field office confirmed that the drainages would most likely be isolated unregulated waters due to the majority of the drainages within the Mojave Desert being isolated with the exception of the Mojave River and any of its tributaries, which the Corps has determined to have a navigation system and interstate commerce. Isolated waters within the Mojave Desert would still be subject to regulation from the State Water Resources Control Board (State Water Board) and the DFG (Aaron Allen pers. comm.).

The sandy substrate of ephemeral drainages is commonly used by a number of reptile species including sidewinder rattlesnakes, California legless lizards (*Anniella pulchra*), California horned lizards, and zebra-tailed lizards (*Callisaurus draconoides*). The banks of ephemeral drainages provide habitat for desert woodrats (*Neotoma lepida*), side-blotched lizards (*Uta stansburiana*), and chuckwallas (*Sauromalus obesus*).

## Special-Status Species

### Special-Status Plants

Based on the literature review, 20 special status plant species were identified as occurring in the Project region. All of these plant species have specific macrohabitat and microhabitat requirements and have highly restricted geographic distributions that are not present in the Project area (CNDDDB 2005; CNPS 2001).

Table 4.3-1 lists these species, their habitats, and their potential for occurring within the Project area.

### Special-Status Wildlife

Based on the U.S. Fish and Wildlife Service (USFWS) special-status species table and CNDDDB review, 62 wildlife species were identified as having potential to occur within the Project area (Table 4.3-2). Of these special-status wildlife species, 14 special-status wildlife species have habitat within the Project area. These 14 special-status wildlife species are discussed below.

#### California Horned Lizard

The California horned lizard (*Phrynosoma coronatum frontale*) is designated as a federal species of concern and a California species of special concern. This

species occurs throughout the Central Valley and Coast Range from Shasta County south to Los Angeles, Ventura, and Santa Barbara Counties. California horned lizards occur in a variety of habitats including clearings in riparian woodlands, chamise chaparral, and grasslands with loose, friable soils (Jennings and Hayes 1994).

CNDDDB (2005) indicated two California horned lizard records within 10 miles of the Project area. One was adjacent to the southern end of the proposed delivery pipeline and the other was approximately 3 miles south of the California aqueduct. Annual grassland and rabbitbrush habitats located throughout the Project area provide suitable habitat for California horned lizards. However, the agricultural area for the proposed recharge basins does not contain suitable habitat. A California horned lizard was observed at the southern end of the proposed delivery pipeline alignment during the reconnaissance field survey

### **California Legless Lizard**

The California legless lizard (*Anniella pulchra*) is designated as a California species of special concern. The California legless lizard is a near-endemic to California (Jennings and Hayes 1994). The distribution of the California legless lizard includes the Coast Range from Contra Costa County south to the Mexican border, the floor of the San Joaquin Valley, the Tehachapi Mountains, and scattered desert slope locations in the Antelope Valley at the western edge of the Mojave Desert (Zeiner et al. 1988, Jennings and Hayes 1994). Suitable habitat includes areas with sandy or loose loamy soils under sparse vegetations. The lizard is often found under or in close proximity to surface objects such as logs, rocks, old boards, etc. Rocky soils or areas disturbed by agriculture, sand mining, or other human uses apparently lack legless lizards. Soil moisture is essential for legless lizards. They prefer substrates with higher moisture content (Jennings and Hayes 1994).

CNDDDB (2005) did not indicate any California legless lizard records within 10 miles of the Project area. Two records from 1988 occur approximately 5 miles west of Lancaster. No evidence of legless lizards was observed during the field survey, though evidence of presence is often very difficult to observe. Annual grassland and rabbitbrush habitats throughout the Project area provide suitable habitat for California legless lizards. The agricultural area for the proposed recharge basins does not contain suitable habitat.

### **Desert Tortoise**

The desert tortoise (*Gopherus agassizii*) is federally and state-listed as threatened. In California, the desert tortoise ranges throughout the Mojave and Colorado deserts of northeastern Los Angeles, eastern Kern, and southeastern Inyo Counties and throughout most of San Bernardino, Riverside, and Imperial Counties (California Department of Fish and Game 2005). Desert tortoises most commonly occur on gently sloping terrain with sandy or gravelly soils and with scattered shrubs and inter-shrub space for herbaceous plant growth, though tortoises can also be found in steeper and rockier areas (U.S. Fish and Wildlife Service 1994).

**Table 4.3-1.** Special-Status Plant Species Known to Occur in the Antelope Valley Region and Their Potential to Occur within the Project Area

Common and Scientific Name	Legal Status <sup>a</sup> Fed/State/CNPS	Geographic Distribution	Habitat Requirements	Blooming Period	Likelihood to Occur within Project Area <sup>b</sup>
Braunton's milk-vetch <i>Astragalus brauntonii</i>	E/-/1B	Los Angeles, Orange, Ventura Counties	Closed-cone coniferous forest, chaparral, coastal scrub, valley and foothill grassland/ recent burns or disturbed areas, usually carbonate; 13–2100 feet	May–August	None. Suitable habitat not present.
Forest Camp sandwort <i>Arenaria macradenia</i> var. <i>kuschei</i>	SC/-/3	Mojave Desert, Forest Camp, Inyo, Los Angeles, and San Bernardino Counties	Chaparral (openings, granitic); 4000–5550 feet	June–July	None. Suitable habitat not present.
Lancaster milk-vetch <i>Astragalus preussii</i> var. <i>laxiflorus</i>	-/-/1B	Southwestern Mojave Desert, Antelope Valley, Los Angeles County, only California location is near Lancaster	Chenopod scrub, alkali clay flats; about 2,300 feet	March–May	None. Suitable habitat not present.
Nevin's barberry <i>Berberis nevinii</i>	E/E/1B	Los Angeles, San Bernardino, Riverside, and San Diego Counties	Chaparral, coastal scrub, and alluvial fan sage scrub, on steep north-facing slopes or in low grade sandy washes; 900–1,600 feet	March–April	None. Suitable habitat not present.
Slender mariposa lily <i>Calochortus clavatus</i> var. <i>gracilis</i>	SC/-/1B	San Gabriel mountains, Los Angeles County	Chaparral, coastal scrub, shaded foothill canyons, often on grassy slopes; 1,380–2,500 feet	March	None. Suitable habitat not present.
Alkali mariposa lily <i>Calochortus striatus</i>	SC/-/1B	Western Mojave Desert, Kern, Los Angeles, San Bernardino, and Tulare Counties	Chaparral, chenopod scrub, Mohavean desert scrub, in alkaline meadows and ephemeral washes; 300–5,200 feet	April–June	None. Suitable habitat not present.
San Fernando Valley spineflower <i>Chorizanthe parryi</i> var. <i>fernandina</i>	SC/E/1B	Recently observed near Lasky Mesa in Ventura County. Historically known from Los Angeles, Orange, and San Diego Counties.	Coastal sage scrub, on sandy soils	April–June	None. Suitable habitat not present.



Table 4.3-1. Continued

Common and Scientific Name	Legal Status <sup>a</sup> Fed/State/CNPS	Geographic Distribution	Habitat Requirements	Blooming Period	Likelihood to Occur within Project Area <sup>b</sup>
Parry's spineflower <i>Chorizanthe parryi</i> var. <i>parryi</i>	SC/-/3	Central and eastern south coast, eastern Transverse Range, northwestern Sonoran Desert. Riverside, and San Bernardino, and possibly Los Angeles Counties	Coastal scrub, chaparral, on dry slopes and flats, in dry, sandy soils; 130–5,540 feet	April–June	None. Suitable habitat not present.
White-bracted spineflower <i>Chorizanthe xanti</i> var. <i>leucotheca</i>	-/-/4	Eastern San Bernardino mountains, San Jacinto mountains, Riverside and San Bernardino Counties	Mohavean desert scrub, pinyon-juniper woodland	April–June	None. Suitable habitat not present.
Slender-horned spineflower <i>Dodecahema leptoceras</i>	E/E/1B	Los Angeles, Riverside, and San Bernardino Counties	Chaparral, cismontane woodland, coastal scrub (alluvial fan)/ sandy; 650–2500 feet	April–June	None. Suitable habitat not present.
Conejo dudleya <i>Dudleya abramsii</i> ssp. <i>parva</i>	T/-/1B	Ventura County	Rocky clay soils in coastal scrub, valley and foothill grassland	May–June	None. Suitable habitat not present.
Marcescent dudleya <i>Dudleya cymosa</i> ssp. <i>marcescens</i>	T/R/1B	Los Angeles and Ventura Counties	Volcanic soils in chaparral	April–June	None. Suitable habitat not present.
Santa Monica Mtns. dudleya <i>Dudleya cymosa</i> ssp. <i>ovatifolia</i>	T/-/1B	Los Angeles, Orange, and Ventura Counties	Chaparral, coastal scrub, volcanic	March–June	None. Suitable habitat not present.
Verity's dudleya <i>Dudleya verityi</i>	T/-/1B	Ventura County	Chaparral, cismontane woodland, coastal scrub, on volcanic soils	May–June	None. Suitable habitat not present.
Round-leaved filaree <i>Erodium macrophyllum</i>	-/-/2	Sacramento Valley, northern San Joaquin Valley, Central Western California, South Coast, & northern Channel Islands (Santa Cruz Island)	Open sites, dry grasslands, and shrublands; below 4,000 feet	March–May	None. Suitable habitat not present.

**Table 4.3-1. Continued**

Common and Scientific Name	Legal Status <sup>a</sup> Fed/State/CNPS	Geographic Distribution	Habitat Requirements	Blooming Period	Likelihood to Occur within Project Area <sup>b</sup>
San Gabriel bedstraw <i>Galium grande</i>	SC/-/1B	San Gabriel mountains, Los Angeles County	Chaparral, oak woodland, lower montane coniferous forest, rocky slopes; 2,200–4,000 feet	January–July	None. Suitable habitat not present.
Sagebrush loeflingia <i>Loeflingia squarrosa</i> var. <i>artemisiarum</i>	-/-/1B	Inyo, Kern, Los Angeles, and Riverside Counties	Great Basin scrub and Sonoran desert scrub on sandy flats and dunes; 2,200–3,900 feet	April–May	None. Suitable habitat not present.
Spreading navarretia <i>Navarretia fossalis</i>	T/-/1B	Scattered occurrences in southwest California, from Los Angeles County to San Diego County; Baja California	San Diego hardpan and claypan vernal pools, saltbush scrub, and playas; 100–4,300 feet	April–June	None. Suitable habitat not present.
California Orcutt grass <i>Orcuttia californica</i>	E/E/1B	Scattered occurrences in southwest California, Los Angeles, Riverside, San Diego, and Ventura Counties, Baja California	Vernal pools	April–June	None. Suitable habitat not present.
Lyon’s pentachaeta <i>Pentachaeta lyonii</i>	E/E/1B	Los Angeles and Ventura Counties, Santa Catalina Island	Valley grasslands and openings in chaparral	March–August	None. Suitable habitat not present.

Notes:

<sup>a</sup> Status explanations:

**Federal**

E = listed as endangered under the federal Endangered Species Act.

T = listed as threatened under the federal Endangered Species Act.

PE = proposed for federal listing as endangered under the federal Endangered Species Act.

PT = proposed for federal listing as threatened under the federal Endangered Species Act.

C = species for which USFWS has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposed rule to list.

SC = species of concern; species for which existing information indicates it may warrant listing but for which substantial biological information to support a proposed rule is lacking.

– = no listing.

**State**

E = listed as endangered under the California Endangered Species Act.

- T = listed as threatened under the California Endangered Species Act.
- R = listed as rare under the California Native Plant Protection Act. This category is no longer used for newly listed plants, but some plants previously listed as rare retain this designation.
- CE = candidate species for listing as endangered under the California Endangered Species Act
- SSC = species of special concern in California.
- = no listing.

**California Native Plant Society (CNPS)**

- 1A = List 1A species: presumed extinct in California.
- 1B = List 1B species: rare, threatened, or endangered in California and elsewhere.
- 2 = List 2 species: rare, threatened, or endangered in California but more common elsewhere.
- 3 = List 3 species: plants about which more information is needed to determine their status.
- 4 = List 4 species: plants of limited distribution.
- = no listing.
- \* = known populations believed extirpated from that County
- ? = population location within County uncertain

<sup>b</sup> Definitions of levels of occurrence likelihood:

- High: Known occurrence of plant in region from Natural Diversity Data Base, or other documents in the vicinity of the project; or presence of suitable habitat conditions and suitable microhabitat conditions.
  - Moderate: Known occurrence of plant in region from Natural Diversity Data Base, or other documents in the vicinity of the project; or presence of suitable habitat conditions but suitable microhabitat conditions are not present.
  - Low: Plant not known to occur in the region from the Natural Diversity Data Base, or other documents in the vicinity of the project; or habitat conditions of poor quality.
  - None: Plant not known to occur in the region from the Natural Diversity Data Base, or other documents in the vicinity of the project; or suitable habitat not present in any condition.
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**Table 4.3-2.** Special-Status Wildlife Species Known to Occur in the Antelope Valley Region and Their Potential to Occur within the Project Area

Common and Scientific Name	Status Fed/State	Geographic Distribution	Habitat Requirements	Potential to Occur in the Study Area
<b>Wildlife Species With Habitat in Project Area</b>				
<b>Reptiles</b>				
California horned lizard <i>Phrynosoma coronatum frontale</i>	SC/SSC	Central Valley, including foothills, south to southern California; Coast Ranges south of Sonoma County; below 4,000 feet in northern California.	Grasslands, brushlands, woodlands, and open coniferous forest with sandy or loose soil; requires abundant ant colonies for foraging.	High. Observed within the Project area.
California legless lizard <i>Anniella pulchra</i>	-/SSC	Along the Coast, Transverse, and Peninsular Ranges from Contra Costa County to San Diego County with occurrences in the San Joaquin Valley and the Tehachapi Mountains and the mountain of southern California.	Habitats with loose soil for burrowing or thick duff or leaf litter; often forages in leaf litter at plant bases; may be found on beaches, sandy washes, and in woodland, chaparral, and riparian areas.	Low
<b>Birds</b>				
California horned lark <i>Eremophila alpestris actia</i>	-/SSC	Found throughout much of the state, less common in mountainous areas of the north coast and in coniferous or chaparral habitats.	Common to abundant resident in a variety of open habitats, usually where large trees and shrubs are absent. Grasslands and deserts to dwarf shrub habitats above tree line.	High. Observed within the Project area.
Le Conte's thrasher <i>Toxostoma lecontei</i>	SC/SSC	In the southern San Joaquin Valley, restricted to the Taft-Maricopa area; also occurs in the upper Kern River basin, Owens Valley, and Mojave and Sonora Deserts.	Sparsely vegetated plains, canyon floors, gently sloping hills, large washes, and alkali scrublands.	Low
Loggerhead shrike <i>Lanius ludovicianus</i>	-/SSC	Resident and winter visitor in lowlands and foothills throughout California.	Prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches.	Low
Long-billed curlew <i>Numenius americanus</i>	-/SSC	Nests in northeastern California in Modoc, Siskiyou, and Lassen Counties. Winters along the coast and in interior valleys west of Sierra Nevada, the Antelope Valley, and around the Salton Sea.	Nests in high-elevation grasslands adjacent to lakes or marshes. During migration and in winter frequents coastal beaches and mudflats and interior grasslands and agricultural fields.	High. Does not breed in project area.

**Table 4.3-2.** Continued

Common and Scientific Name	Status Fed/State	Geographic Distribution	Habitat Requirements	Potential to Occur in the Study Area
Mountain plover <i>Charadrius montanus</i>	PT/SSC	Does not breed in California; in winter, found in the Central Valley south of Yuba County, along the coast in parts of San Luis Obispo, Santa Barbara, Ventura, and San Diego Counties; parts of Imperial, Riverside, Kern, and Los Angeles Counties.	Occupies open plains or rolling hills with short grasses or very sparse vegetation; nearby bodies of water are not needed; may use newly plowed or sprouting grain fields.	High. Has been observed during the winter near the Project area. Does not breed in the Project area.
Swainson's hawk <i>Buteo swainsoni</i>	-/T	Lower Sacramento and San Joaquin Valleys, the Klamath Basin, and Butte Valley. Highest nesting densities occur near Davis and Woodland, Yolo County.	Nests in oaks or cottonwoods in or near riparian habitats. Forages in grasslands, irrigated pastures, and grain fields.	Low because only a few known records from Antelope Valley
Western burrowing owl <i>Athene cunicularia hypugea</i>	SC/SSC	Lowlands throughout California, including the Central Valley, northeastern plateau, southern deserts, and coastal areas. Rare along south coast.	Level, open, dry, heavily grazed or low stature grassland or desert vegetation with available burrows.	Low because only a few known records from Antelope Valley
White-tailed kite <i>Elanus leucurus</i>	-/FP	Lowland areas west of Sierra Nevada from the head of the Sacramento Valley south, including coastal valleys and foothills to western San Diego County at the Mexico border.	Low foothills or valley areas with valley or live oaks, riparian areas, and marshes near open grasslands for foraging.	High. Observed within the Project area.
<b>Mammals</b>				
American badger <i>Taxidea taxius</i>	-/SSC	Found throughout most of California except in the northern North Coast area. Suitable habitat is characterized by herbaceous, shrub, and open stages of most habitats with dry, friable soils.	Dig burrows in friable soils for cover. Frequently uses old burrows.	High
Fringed myotis <i>Myotis thysanodes</i>	SC/-	Occurs throughout California except the southeastern deserts and the Central Valley.	Found in a wide variety of habitats from low desert scrub to high elevation coniferous forests. Day and night roosts in caves, mines, trees, buildings, and rock crevices.	Low

**Table 4.3-2.** Continued

Common and Scientific Name	Status Fed/State	Geographic Distribution	Habitat Requirements	Potential to Occur in the Study Area
Small-footed myotis <i>Myotis ciliolabrum</i>	SC/-	Occurs in the Sierra Nevada, south Coast, Transverse, and Peninsular Ranges, and in the Great Basin.	Open stands in forests and woodlands, as well as shrub lands and desert scrub. Uses caves, crevices, trees, and abandoned buildings.	Low
Southern grasshopper mouse <i>Onychomys torridus ramona</i>	SC/SSC	Southwestern San Bernardino, northern Los Angeles, western Riverside, and San Diego Counties.	Grassland and chaparral habitats.	Low
<b>Wildlife Species Without Habitat in Project Area</b>				
<b>Invertebrates</b>				
California linderiella fairy shrimp <i>Linderiella occidentalis</i>	SC/-	Ranges from near Redding in the north to as far south as Fresno County, mainly east of the Sacramento and San Joaquin rivers.	Occurs in basins with a variety of geological origins; i.e., Northern hardpan, northern volcanic ash flows, earth slumps, depressions in lava flows, and depressions in sandstone caused by weathering.	None. No suitable habitat in Project area. Project is outside of species' range
Quino checkerspot butterfly <i>Euphydryas editha quino</i> (=wrighti)	E/--	Portions of Riverside and San Diego Counties, California, and northwestern Baja California.	Sunny openings within chaparral and coastal sage shrublands.	Project is outside of species' range.
Riverside fairy shrimp <i>Streptocephalus woottoni</i>	E/--	Vernal pools from southwestern Riverside County and western San Diego County, to northwestern Baja California, Mexico. One population known from Orange County	Found only in deep lowland pools that retain water through the warmer weather of late spring	None. No suitable habitat in Project area. Project is outside of species' range
San Emigdio blue <i>Plebulina emigdionis</i> (=Plebejus e.)	SC/-	Inyo County south through Mojave Desert, lower San Joaquin Valley; Bouquet and Mint Canyons, Los Angeles County.	Shadscale scrub, often near streambeds or washes.	None. No suitable habitat in Project area.
Tehachapi Mountain silverspot <i>Speyeria egleis tehachapina</i>	SC/-	Tehachapi Mountains, Los Angeles County.	Mountain meadows at middle to high elevations.	None. No suitable habitat in Project area.

**Table 4.3-2.** Continued

Common and Scientific Name	Status Fed/State	Geographic Distribution	Habitat Requirements	Potential to Occur in the Study Area
Vernal pool fairy shrimp <i>Branchinecta lynchi</i>	T/-	Central Valley, central and south Coast Ranges from Tehama County to Santa Barbara County. Isolated populations also in Riverside County.	Common in vernal pools; also found in sandstone rock outcrop pools.	None. No suitable habitat in Project area. Project is outside of species' range
<b>Amphibians</b>				
Arroyo toad <i>Bufo californicus</i>	E/SSC	Along the coast and foothills from San Luis Obispo County to San Diego County and inland to San Bernardino County	Prefers sandy arroyos and river bottoms with open riparian vegetation in inland valleys and foothills.	None. No suitable habitat in Project area.
California red-legged frog <i>Rana aurora draytoni</i>	T/SSC	Found along the coast and coastal mountain ranges of California from Marin County to San Diego County and in the Sierra Nevada from Tehama County to Fresno County.	Permanent and semipermanent aquatic habitats, such as creeks and cold-water ponds, with emergent and submergent vegetation. May aestivate in rodent burrows or cracks during dry periods.	None. No suitable habitat in Project area.
Tehachapi slender salamander <i>Batrachoseps stebbinsi</i>	SC/T	Restricted to the Tehachapi Mountains, southeast of Bakersfield in Kern County; perhaps in Los Angeles and Ventura Counties.	North-facing talus slopes in valley-foothill hardwood, mixed conifer, and valley-foothill riparian habitats from 2,500–5000 feet.	None. No suitable habitat in Project area.
Western spadefoot <i>Scaphiopus hammondi</i>	SC/SSC	Sierra Nevada foothills, Central Valley, Coast Ranges, coastal counties in southern California.	Shallow streams with riffles and seasonal wetlands, such as vernal pools in annual grasslands and oak woodlands.	None. No suitable habitat in Project area.
<b>Reptiles</b>				
Blunt-nosed leopard lizard <i>Gambelia</i> (= <i>Crotaphytus</i> ) <i>silus</i>	E/E	San Joaquin Valley from Stanislaus County through Kern County and along the eastern edges of San Luis Obispo and San Benito Counties	Open habitats with scattered low bushes on alkali flats, and low foothills, canyon floors, plains, washes, and arroyos; substrates may range from sandy or gravelly soils to hardpan	Project is outside of species' range
Coastal western whiptail <i>Cnemidophorus tigris multiscutatus</i>	SC/-	Ventura County south through coastal counties into Baja California.	Mixed chaparral, hardwood associations, and annual grassland habitats; washes and other sandy areas.	None. Project is outside of species' range

**Table 4.3-2.** Continued

Common and Scientific Name	Status Fed/State	Geographic Distribution	Habitat Requirements	Potential to Occur in the Study Area
Desert tortoise <i>Gopherus agassizii</i>	T/T	Southern California deserts in Inyo, San Bernardino, Kern, Los Angeles, Riverside, San Diego, and Imperial Counties	Desert areas with sandy loam to gravelly soils for digging dens; favors creosote and cactus scrub habitats with high densities of annual blooms in spring for feeding	None. Project within the species' historic range but is outside of current range
Rosy boa <i>Lichanura trivirgata</i>	SC/-	Los Angeles and Riverside Counties south into Baja California.	Rocky, chaparral-covered hillsides and canyons.	None. No suitable habitat in Project area.
Southern rubber boa <i>Charina bottae umbratica</i>	SC/T	Known only from several localities in the San Bernardino Mountains, San Bernardino County, near Idyllwild, Riverside County, and near Mt. Pinos, Kern County.	Moist coniferous forests and montane hardwood habitats with suitable escape cover, including rocks, logs, and leaf litter.	None. No suitable habitat in Project area. Project is outside of species' range.
Southwestern pond turtle <i>Clemmys marmorata pallida</i>	SC/SSC	Occurs along the central coast of California east to the Sierra Nevada and along the southern California coast inland to the Mojave and Sonora Deserts; range overlaps with that of the northwestern pond turtle throughout the Delta and in the Central Valley.	Woodlands, grasslands, and open forests; aquatic habitats, such as ponds, marshes, or streams, with rocky or muddy bottoms and vegetation for cover and food.	None. No suitable habitat in Project area.
Two-striped garter snake <i>Thamnophis hammondi</i>	SC/SSC	Known range extends through the south coast and peninsular ranges west of the San Joaquin valley from the Salinas Valley and the southeastern slopes of the Diablo range, south to the Mexican border.	Perennial and intermittent streams having rocky beds bordered by willow thickets or other dense vegetation. Also inhabits large sandy riverbeds, such as the Santa Clara river, if a strip of riparian vegetation is present, and stock ponds if riparian vegetation and fish and amphibian prey are present.	None. No suitable habitat in Project area.



Table 4.3-2. Continued

Common and Scientific Name	Status Fed/State	Geographic Distribution	Habitat Requirements	Potential to Occur in the Study Area
<b>Birds</b>				
American peregrine falcon <i>Falco peregrinus anatum</i>	-/E	Permanent resident along the north and south Coast Ranges. May summer in the Cascade and Klamath Ranges and through the Sierra Nevada to Madera County. Winters in the Central Valley south through the Transverse and Peninsular Ranges and the plains east of the Cascade Range.	Nests and roosts on protected ledges of high cliffs, usually adjacent to lakes, rivers, or marshes that support large prey populations.	No suitable nesting habitat within Project area.
Bald eagle <i>Haliaeetus leucocephalus</i>	T/E	Nests in Siskiyou, Modoc, Trinity, Shasta, Lassen, Plumas, Butte, Tehama, Lake, and Mendocino Counties and in the Lake Tahoe Basin. Reintroduced into central coast. Winter range includes the rest of California, except the southeastern deserts, very high altitudes in the Sierra Nevada, and east of the Sierra Nevada south of Mono County.	In western North America, nests and roosts in coniferous forests within 1 mile of a lake, reservoir, stream, or the ocean.	No suitable nesting habitat within Project area.
Black swift <i>Cypseloides niger</i> (nesting)	-/SSC	Breeds very locally in the Sierra Nevada and Cascade Range, the San Gabriel, San Bernardino, and San Jacinto mountains, and in coastal bluffs from San Mateo county south to near San Luis Obispo county.	Nests in moist crevice or cave on sea cliffs above the surf, or on cliffs behind, or adjacent to, waterfalls in deep canyons.	No suitable nesting habitat within Project area.
Brown pelican <i>Pelicanus occidentalis</i>	E/E	Found along the entire coast of California. Uncommon in the Salton Sea from July to September	Estuarine, subtidal, and marine pelagic waters.	No suitable nesting habitat within Project area.
California condor <i>Gymnogyps Californianus</i>	E/E	Historically, rugged mountain ranges surrounding the southern San Joaquin Valley; currently, most individuals are in captive populations, but a few birds were recently released in the rugged portions of the Los Padres National Forest.	Requires large blocks of open savanna, grasslands, and foothill chaparral with large trees, cliffs, and snags for roosting and nesting.	No suitable nesting habitat within Project area.

Table 4.3-2. Continued

Common and Scientific Name	Status Fed/State	Geographic Distribution	Habitat Requirements	Potential to Occur in the Study Area
California gnatcatcher <i>Poliophtila californica</i>	T/SSC	Eastern Orange and southwestern Riverside counties, south through the coastal foothills of San Diego County and along the coast of Los Angeles County	Arid coastal scrub below 2,500 feet.	No suitable nesting habitat within Project area.
California least tern <i>Sterna antillarum</i> (= <i>albifrons</i> ) <i>browni</i> (nesting colony)	E/E	Nests on beaches along the San Francisco Bay and along the southern California coast from southern San Luis Obispo County south to San Diego County	Nests on sandy, upper ocean beaches, and occasionally uses mudflats; forages on adjacent surf line, estuaries, or the open ocean	No suitable nesting habitat within Project area.
California thrasher <i>Toxostoma redivium</i>	SC/-	Endemic to California. Breeds from northern California, south along the Coast Range and on the western slope of the Sierra Nevada; on foothill slopes on both east and west side of Central Valley; in the Transverse Range of southern California east to desert edge.	Core habitat in coastal ranges and interior foothills is chaparral. At higher elevations, manzanita and mountain mahogany.	No suitable nesting habitat within Project area.
Costa's hummingbird <i>Calypte costae</i>	SC/-	Breeds in California along coast range of southern California north to Santa Barbara County.	Breeds in sage scrub and chaparral.	No suitable nesting habitat within Project area.
Ferruginous hawk <i>Buteo regalis</i>	SC/SSC	Does not nest in California; winter visitor along the coast from Sonoma County to San Diego County, east-ward to the Sierra Nevada foothills and south-eastern deserts, the Inyo-White Mountains, the plains east of the Cascade Range, and Siskiyou County.	Open terrain in plains and foothills where ground squirrels and other prey are available.	None. Does not nest in California
Lawrence's goldfinch <i>Carduelis lawrencei</i>	SC/-	Restricted to California west of Sierra Nevada. Breeds from Trinity, Shasta, and Tehama counties south along foothills surrounding Central Valley to Kern County; in Coast Range from Contra Costa County south to Santa Barbara County.	Arid and open woodlands near chaparral, tall annual weed fields, and an open water source such as a stream. Live oaks and blue oaks are predominant trees where this species breeds.	None. Project is outside of species' range
Least Bell's vireo <i>Vireo bellii pusillus</i>	E/E	Small populations remain in southern Inyo, southern San Bernardino, Riverside, San Diego, Orange, Los Angeles, Ventura, and Santa Barbara Counties	Riparian thickets either near water or in dry portions of river bottoms; nests along margins of bushes and forages low to the ground; may also be found using mesquite and arrow weed in desert canyons	No suitable nesting habitat within Project area.

**Table 4.3-2.** Continued

Common and Scientific Name	Status Fed/State	Geographic Distribution	Habitat Requirements	Potential to Occur in the Study Area
Lewis' woodpecker <i>Melanerpes lewis</i>	SC/-	Breeds from Siskiyou and Modoc counties south through Cascades and Sierra Nevada; breed in inner Coast Range from Tehama County south to central San Luis Obispo County. Breeders disperse west and south after breeding season.	Important aspects of breeding habitat include an open canopy, a brushy understory offering ground cover, dead or downed woody material, available perches, and abundant insects. Ponderosa pine forest, open riparian woodland dominated by cottonwood, and logged or burned pine forests. Also use oak woodlands and orchards for breeding.	No suitable nesting habitat within Project area.
Prairie falcon <i>Falco mexicanus</i>	-/SSC	Permanent resident in the south Coast, Transverse, Peninsular, and northern Cascade Ranges, the southeastern deserts, Inyo-White Mountains, foothills surrounding the Central Valley, and in the Sierra Nevada in Modoc, Lassen, and Plumas Counties. Winters in the Central Valley, along the coast from Santa Barbara County to San Diego County, and in Marin, Sonoma, Humboldt, Del Norte, and Inyo Counties.	Nests on cliffs or escarpments, usually overlooking dry, open terrain or uplands.	No suitable nesting habitat within Project area.
Rufous hummingbird <i>Selasphorus rufus</i>	SC/-	Rarely winters in coastal and southern California. Migrates through Trinity Alps, Sierra Nevada, and Coastal Range during spring and fall migration. Does not breed in California.	Montane meadows and disturbed areas.	No suitable nesting habitat within Project area.
Southwestern willow flycatcher <i>Empidonax traillii extimus</i>	E/E	Breeds in coastal southern California in the Los Angeles Basin, the San Bernardino/Riverside area, and San Diego County; no longer breeds along the Colorado River and is known to exist only in eight widely disjunct nesting populations	Densely vegetated riparian habitat with streamside associations of cottonwoods and willows	No suitable nesting habitat within Project area.

**Table 4.3-2.** Continued

Common and Scientific Name	Status Fed/State	Geographic Distribution	Habitat Requirements	Potential to Occur in the Study Area
Tricolored blackbird <i>Agelaius tricolor</i>	SC/SSC	Permanent resident in the Central Valley from Butte County to Kern County. Breeds at scattered coastal locations from Marin County south to San Diego County; and at scattered locations in Lake, Sonoma, and Solano Counties. Rare nester in Siskiyou, Modoc, and Lassen Counties.	Nests in dense colonies in emergent marsh vegetation, such as tules and cattails, or upland sites with blackberries, nettles, thistles, and grain fields. Habitat must be large enough to support 50 pairs. Probably requires water at or near the nesting colony.	No suitable nesting habitat within Project area.
Vaux's swift <i>Chaetura vauxi</i>	-/SSC	Coastal belt from Del Norte County south to Santa Cruz County and in mid elevation forests of the Sierra Nevada and Cascade Range.	Nests in hollow, burned-out tree trunks in large conifers.	None. Project is outside of species' range
Western snowy plover (coastal populations) <i>Charadrius alexandrinus nivosus (nesting)</i>	T/SSC	Population defined as those birds that nest adjacent to or near tidal waters, including all nests along the mainland coast, peninsulas, offshore islands, and adjacent bays and estuaries. Twenty breeding sites are known in California from Del Norte to Diego County	Coastal beaches above the normal high tide limit in flat, open areas with sandy or saline substrates; vegetation and driftwood are usually sparse or absent	None. Project is outside of species' range
Yellow-billed cuckoo <i>Coccyzus americanus</i>	SC/E	Nests along the Colorado River, the Sacramento Valley, the Owens Valley, along the south fork of the Kern River, along the Santa Ana River, and along the Amargosa River.	Inhabits extensive deciduous riparian forests with dense understory foliage. Willows almost always a dominant component of the vegetation.	None. Project is outside of species' range

**Table 4.3-2. Continued**

Common and Scientific Name	Status Fed/State	Geographic Distribution	Habitat Requirements	Potential to Occur in the Study Area
<b>Mammals</b>				
Greater western mastiff bat <i>Eumops perotis californicus</i>	SC/SSC	Occurs along the western Sierra primarily at low to mid elevations and widely distributed throughout the southern coast ranges. Recent surveys have detected the species north to the Oregon border.	Found in a wide variety of habitats from desert scrub to montane conifer. Roosts and breeds in deep, narrow rock crevices, but may also use crevices in trees, buildings, and tunnels.	None. Project area does not provide suitable roosting habitat.
Lodgepole chipmunk <i>Tamias speciosus speciosus</i>	SC/-	Occurs in Sierra Nevada from Lassen Co. to Tulare Co. Also found in southern California mountains.	In Sierra Nevada found in open-canopy lodgepole pine, Jeffery pine, mixed conifer, and red fir habitats from 6,000–10,350 feet. In southern California, found in open-canopy forests of mixed conifer, Jeffery pine, lodgepole pine, and limber pine, as well as occasionally in chaparral from 6,400–10,900 feet.	None. Project is outside of species' range
Long-eared myotis <i>Myotis evotis</i>	SC/-	Occurs throughout California except the southeastern deserts and the Central Valley.	Occurs primarily in high elevation coniferous forests, but also found in mixed hardwood/conifer and humid coastal conifer habitats.	None. Project is outside of species' range
Long-legged myotis <i>Myotis volans</i>	SC/-	Mountains throughout California, including ranges in the Mojave desert.	Most common in woodlands and forests above 4,000 feet, but occurs from sea level to 11,000 feet.	None. Project is outside of species' range
Mohave ground squirrel <i>Spermophilus mohavensis</i>	SC/T	Southwestern Inyo County, eastern Kern County, northwestern San Bernardino County, and northeastern Los Angeles County.	Saltbush, alkali desert, and creosote bush scrub at elevations from 1,800–5,000 feet.	None. Project is within the species' historic range but is outside of current range
San Joaquin antelope ground squirrel <i>Ammospermophilus nelsoni</i>	SC/T	Western side of the San Joaquin Valley from southern Merced County south to Kern and Tulare Counties; also found on the Carrizo Plain in San Luis Obispo County and the Cuyama Valley in San Luis Obispo and Santa Barbara Counties.	Arid grasslands from 200–1,200 feet, with loamy soils and moderate shrub cover of atriplex and other shrub species.	None. Project is outside of species' range

**Table 4.3-2. Continued**

Common and Scientific Name	Status Fed/State	Geographic Distribution	Habitat Requirements	Potential to Occur in the Study Area
San Joaquin pocket mouse <i>Perognathus inornatus</i>	SC/-	Occurs throughout the San Joaquin Valley and in the Salinas Valley.	Favors grasslands and scrub habitats with fine textured soils.	None. Project is outside of species' range
Short-nosed kangaroo rat <i>Dipodomys nitratooides brevinasus</i>	SC/SSC	Western side of the San Joaquin Valley from Merced County to Kern County; isolated populations also in San Benito, San Luis Obispo, and Santa Barbara Counties.	Arid grassland and desert scrub communities on flat or gently sloping terrain with friable soils.	None. Project is outside of species' range
Spotted bat <i>Euderma maculatum</i>	SC/SSC	Occurs throughout eastern and southern California, the central Sierra Nevada, and the Sierra Nevada foothills bordering the San Joaquin Valley. Probably occurs in other portions of the state where habitat is suitable.	Found in a wide variety of habitats from low desert to high elevation coniferous forest, primarily in areas associated with cliff and canyon habitat. Females may favor ponderosa pine forests during reproduction.	None. Project area does not provide suitable roosting habitat.
Tehachapi pocket mouse <i>Perognathus alticola inexpectatus</i>	SC/SSC	Known only near Tehachapi Pass and Mount Pinos in Kern and Los Angeles Counties.	Annual grassland and desert scrub communities from 3,500–6,000 feet.	None. Project is outside of species' range
Tulare grasshopper mouse <i>Onychomys torridus tularensis</i>	SC/SSC	Madera, Kings, Kern, San Benito, Fresno and eastern San Luis Obispo Counties.	Grasslands, chaparral, sagebrush and bitterbrush scrub, alkali desert scrub.	None. Project is outside of species' range

Notes:

<sup>a</sup> Species Status explanations:

**Federal**

- E = listed as endangered under the federal Endangered Species Act.
- T = listed as threatened under the federal Endangered Species Act.
- PT = proposed for federal listing as threatened under the federal Endangered Species Act.
- SC = species of concern; species for which existing information indicates it may warrant listing but for which substantial biological information to support a proposed rule is lacking.
- = no listing.

**State**

- E = listed as endangered under the California Endangered Species Act.
- T = listed as threatened under the California Endangered Species Act.
- FP = fully protected under the California Fish and Game Code.

SSC = species of special concern in California.

- = no listing.

<sup>b</sup> Potential to Occur in the Study Area

High: Known occurrences of the species within the study area or California Natural Diversity Database, or other documents, records the occurrence of the species within a 10-mile radius of the study area. Suitable habitat is present within the study area.

Moderate: California Natural Diversity Database, or other documents, records the known occurrence of the species within a 10-mile radius of the study area. Poor quality suitable habitat is present within the study area.

Low: California Natural Diversity Database, or other documents, does not record the occurrence of the species within a 10-mile radius of the study area. Suitable habitat is present within the study area.

None: Outside of species' range or no suitable habitat.

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Desert tortoises spend most of their lives underground in burrows that are excavated under shrubs, under overhanging rock formations, or out in the open (Zeiner et al 1988). Desert tortoises are active aboveground primarily during late winter and spring. During the hot summer months, some tortoises may emerge from their burrows in the early morning and late afternoon, but most remain in their burrows until the late summer rains. By October, most tortoises have retreated to their burrows for winter hibernation (Norwak et al. 1994).

The desert tortoise is severely threatened by continued population declines attributable to disease, human-caused impacts, and the continued cumulative loss, degradation, and fragmentation of habitat caused by development and other construction activities (California Department of Fish and Game 2005).

Though the Project area is within the historical range of the desert tortoise, the species' current range is to the east of the Project area (Norwak et al. 1994). Scott Harris, a biologist with DFG, stated that the Project area does not occur within the current range of the desert tortoise (Harris pers. comm.). There are no CNDDDB records of desert tortoise within 10 miles of the Project area.

#### **California Horned Lark**

The California horned lark (*Eremophila alpestris*) is designated as a California species of special concern. California horned larks are common residents in open habitats throughout California, where dense stands of trees and shrubs are absent. Horned larks frequently forage in short grasslands and other open habits with low, sparse vegetation, including agricultural areas. Horned larks' diet consists of insects, snails and spiders during the breeding season, and includes grass and forb seeds during other seasons. Horned larks build grass-lined nests in depressions on the ground in open areas (Zeiner et al. 1990a).

Several flocks of horned larks were observed throughout the Project area during the reconnaissance field survey. Suitable habitat occurs throughout the Project area.

#### **Le Conte's Thrasher**

The Le Conte's thrasher (*Toxostoma lecontei*) is designated as a federal species of concern and a California species of special concern. Le Conte's thrashers are an uncommon resident of the desert Southwest and northwestern Mexico. In California, it is a permanent resident in the San Joaquin Valley, the Mojave Desert, and the Colorado Desert (Sheppard 1996).

Typical habitat consists of sparsely vegetated desert habitats with high proportion of saltbush or shadscale and /or cylindrical cholla cactus species. Le Conte's thrashers are rarely found in desert habitats consisting entirely of creosote. Substrates are typically sandy with accumulated leaf litter under plants where it searches for arthropod prey. Le Conte's thrashers feed almost exclusively on arthropods. Le Conte's thrashers prefer dense and thorny shrubs or cholla cactus for nesting habitat (Sheppard 1996).



Numbers of Le Conte's thrashers have declined in recent decades. This species is wary of human activity, especially off-road vehicle activity and the removal of shrubs for agricultural and other developments (Zeiner et al. 1990a).

CNDDDB (2005) indicated one Le Conte's thrasher record approximately 3 miles north of the area proposed for the recharge basins. No Le Conte's thrashers were observed during the reconnaissance field survey. Suitable nesting habitat does occur within the proposed delivery pipeline alignment and in rabbitbrush habitat located throughout the Project area. However, no suitable habitat occurs within the agricultural area proposed for the recharge basins.

### **Loggerhead Shrike**

The loggerhead shrike (*Lanius ludovicianus*) is designated as a California species of special concern. Loggerhead shrikes are a widespread breeding species in North America, occurring from the southern Canadian provinces south across most of the United States and into Mexico (Yosef 1996). In California, loggerhead shrikes occur in open habitats with scattered shrubs, trees, posts, fences, utility lines, and other perches. Habitats include valley foothill forests, pinyon-juniper, desert riparian, and Joshua tree habitats (Zeiner et al. 1990a). Loggerhead shrikes are adaptable to urban environments as long as preferred habitat characteristics and abundant prey supplies are present (Yosef 1996).

The loggerhead shrike is a predatory songbird. As opportunistic predators, loggerhead shrikes feed on a wide variety of prey, including insects, small mammals and birds, reptiles, amphibians, and occasionally carrion. Prey are often impaled on sharp objects such as thorns and barbed wire fences (Yosef 1996). Nesting habitat includes densely foliated shrubs and trees near open habitats (Zeiner et al. 1990a). Suitable nesting and foraging habitat occurs throughout the Project area. However, CNDDDB (2005) did not have any records of loggerhead shrikes within 10 miles of the Project area and no loggerhead shrikes were observed during the reconnaissance field survey.

### **Long-Billed Curlew**

The long-billed curlew (*Numenius americanus*) is designated as a California species of special concern. Long-billed curlews are a winter resident in most of California but only breed in the extreme northeast portion of the state (the Klamath Basin east to the Modoc Plateau). In winter months, long-billed curlews are found along the California coast, in the central and southern portions of the Central Valley, in the Antelope Valley, and around the Salton Sea (Dugger and Dugger 2002). Winter habitats include large coastal estuaries, open grasslands, and agricultural fields (Zeiner et al. 1990a).

Agricultural areas located in the Project area provide suitable winter foraging habitat. However, CNDDDB (2005) had no long-billed curlew records within 10 miles of the Project area.

### **Mountain Plover**

The mountain plover (*Charadrius montanus*) has been federally proposed as threatened and is designated as a California species of special concern. Mountain plovers are a winter resident in California from September through March. In

California, typically found in short grasslands and plowed fields of the Central Valley, foothill valley of the San Joaquin Valley, and in scattered location throughout the desert regions (Zeiner et al. 1990a). Mountain plovers do not nest in California. They nest in the short-grass prairies of New Mexico, Colorado, Wyoming, and Montana (Knopf 1996). CNDDDB (2005) indicated a mountain plover record approximately 5 miles southwest of the area proposed for the recharge basins. Agricultural areas located in the Project area provide suitable winter foraging habitat.

### **Swainson's Hawk**

Swainson's hawks (*Buteo swainsoni*) are a federal species of concern, are protected under the federal Migratory Bird Treaty Act (MBTA), and are state-listed as threatened. Swainson's hawks inhabit grasslands, sage-steppe plains, and agricultural regions of western North America during the breeding season, and winter in grassland and agricultural regions from Central Mexico to southern South America (England et al. 1997).

In California, the nesting distribution includes the Sacramento and San Joaquin Valleys, the Great Basin sage-steppe communities and associated agricultural valleys in extreme northeastern California, isolated valleys in the Sierra Nevada in Mono and Inyo Counties, and limited areas of the Mojave Desert region including the Antelope Valley (DFG 1993).

Since 1980, on the basis of nesting records alone, populations in California appear relatively stable. However, continued agricultural conversion and practices, urban development, and water development have reduced available habitat for Swainson's hawks throughout their range in California; this habitat reduction could potentially result in a long-term declining trend. The status of populations, particularly with respect to juvenile survivorship, remains unclear.

In California, Swainson's hawk habitat generally consists of large, flat, open, undeveloped landscapes that include suitable grassland or agricultural foraging habitat and sparsely distributed trees for nesting (England et al. 1997). Foraging habitat include open fields and pastures. Preferred foraging habitats for Swainson's hawk include alfalfa fields, fallow fields, low-growing row or field crops, rice fields during the non-flooded period, and cereal grain crops (DFG 1994). Prey species include ground squirrels, California voles, pocket gophers, deer mice, reptiles, and insects (DFG 1994; England et al. 1997).

Swainson's hawks usually nest in large native trees such as valley oak (*Quercus lobata*), cottonwood (*Populus fremontia*), and willows (*Salix* spp.), although nonnative trees, such as eucalyptus (*Eucalyptus* spp.), are occasionally used. Nests occur in riparian woodlands, roadside trees, trees along field borders, isolated trees and small groves, trees in windbreaks, and the edges of remnant oak woodlands. In some locales, urban nest sites have been recorded. Nests are constructed using materials from the nest tree or nearby trees, are up to 60 centimeters (24 inches) in diameter, and are usually constructed as high as possible in the tree, providing optimal protection and visibility (England et al. 1997).

During most of the breeding season (March–August), nesting pairs maintain a territory around the nest that they defend. During the incubation and brooding phases of the nesting cycle (April–June), the male does the majority of the foraging and provisions the female, who provides the primary care of young during incubation and brooding (England et al. 1997). Foraging bouts are generally conducted alone; however, inter- and intraspecific foraging groups may form away from the defended territory. Adults generally roost at or near the nest site during inactive periods (England et al. 1997).

CNDDDB records (2005) indicate two records of Swainson's hawk approximately 5 miles southeast of the area proposed for the recharge basins. These nest records were from 1995 and 1999. Several large trees throughout and around the periphery of the area proposed for the recharge basins could provide suitable nesting habitat. A large unoccupied stick nest was observed in a pine tree just north of the area proposed for the recharge basins. The species that occupied this nest could not be determined. Agricultural fields and annual grasslands in the Project areas provide suitable foraging habitat. However, no Swainson's hawks were observed during the reconnaissance field survey.

### **Western Burrowing Owl**

Western burrowing owls (*Athene cunicularia*) are designated as a federal species of concern and as a California species of special concern and are protected under the MBTA. Western burrowing owls were formerly a common permanent resident throughout much of California, but population declines were noticeable by the 1940s and have continued to the present. Farming has taken a major toll on western burrowing owl populations and their habitat by destroying nesting burrows and exposing breeders and their young to the toxic effects of pesticides (Haug et al. 1993).

Western burrowing owls prefers open, dry, short grassland habitats with few trees and are often associated with burrowing mammals such as California ground squirrels. It occupies burrows, typically abandoned ground squirrels or other burrowing mammals, but may also use artificial burrows such as abandoned pipes, culverts, and debris piles (DFG 1995; Haug et al. 1993). Prey includes arthropods, amphibians, small reptiles, small mammals, and birds, particularly horned larks (Haug et al. 1993).

The breeding season usually extends from late February through August. Western burrowing owls often nest in roadside embankments, on levees, and along irrigation canals. This species is more diurnal than most owls and can often be observed during the day standing outside the entrance to its burrow (Haug et al. 1993).

CNDDDB (2005) indicated two western burrowing owl records within 5 miles southeast of the area proposed for the recharge basins and one record approximately 5 miles southeast of the southern end of the proposed delivery pipeline alignment. Suitable western burrowing owl habitat occurs throughout the Project areas. However, no burrowing owls were observed during the reconnaissance field survey.

### **White-Tailed Kite**

The white-tailed kite (*Elanus leucurus*) is a federal species of concern, is protected under the MBTA, and is a fully protected species under the Fish and Game Code. White-tailed kites were once threatened with extinction in North America during the early twentieth century. White-tailed kite populations recovered throughout its range in the U.S. from small populations that survived in California, Texas, and Florida. However, since the 1980s, many white-tailed kite populations have been declining, apparently due to loss of habitat and increased disturbance of nests (Dunk 1995).

White-tailed kites nest in riparian forest and oak woodland habitats and forage in a variety of open habitats such as grasslands and marshes (Dunk 1995). White-tailed kites feed primarily small mammals including voles (*Microtus sp.*), pocket mice (*Perognathus sp.*), and harvest mice (*Reithrodontomys sp.*).

The breeding season generally extends from early February through early August. White-tailed kites usually nest in large native trees, though nonnative trees also are occasionally used. Nest trees are generally at the edge of wooded habitat next to open fields. Large trees in areas that have been developed may also be used, though the trees need to be close to open fields for foraging (Dunk 1995).

CNDDDB (2005) did not have any nesting white-tailed kite records within 10 miles of the Project area. However, a white-tailed kite was observed flying over the area proposed for the recharge basins during the reconnaissance field survey. Several large trees throughout and around the periphery of the area proposed for the recharge basins could provide suitable nesting habitat. A large unoccupied stick nest was observed in a pine tree just north of the area for the proposed recharge basins. The species that occupied this nest could not be determined. Agricultural fields and annual grasslands in the Project area provide suitable foraging habitat.

### **American Badger**

The American badger (*Taxidea taxus*) is designated as a California species of special concern. The species is found throughout the state except in the north coast region. Badgers are most abundant in drier areas with friable soils. Other fossorial animals often use burrows made by badgers. Badgers are carnivorous and prey upon fossorial rodents, especially ground squirrels and pocket gophers, as well as reptiles, insects, earthworms, eggs, and carrion (Zeiner et al. 1990b).

CNDDDB (2005) indicated two badger records within 10 miles of the Project area. One occurrence is at the southern end of the proposed delivery pipeline alignment and the other occurrence is located approximately 5 miles east of the area proposed for the recharge and recovery facilities. Annual grassland and rabbitbrush habitats throughout the Project area provide suitable habitat for badgers. However, no badgers, or suitable badger burrows were observed during the reconnaissance field survey.

### **Fringed Myotis**

The fringed myotis (*Myotis thysanodes*) is designated as a federal species of concern. The species is a year-round resident in California. It is found in a variety of habitats including low desert scrub to high elevation coniferous forests and uses buildings, mines, and trees for day and night roosts. In California, fringed myotis have been found in Joshua tree woodlands (Brown and Pierson 1996). The fringed myotis feeds primarily on small beetles along forest and riparian edges. Fringed myotis are easily disturbed at roosting sites (Zeiner et al. 1990b).

CNDDDB (2005) did not have any fringed myotis records within 10 miles of the Project area and none was observed during the reconnaissance field visit. Abandoned and seldom-used building and Joshua trees located in the Project areas provide suitable roosting habitat for fringed myotis.

### **Mohave Ground Squirrel**

The Mohave ground squirrel (*Spermophilus mohavensis*) is state-listed as threatened. Mohave ground squirrels are restricted to the Mojave Desert in San Bernardino, Inyo, Kern, and extreme northeastern Los Angeles Counties (California Department of Fish and Game 2005). The cities of Mojave in Kern County and Lancaster in Los Angeles County are near the western edge of Mohave ground squirrel's range. Habitats that Mohave ground squirrels prefer include saltbush scrub, alkali desert scrub, creosote scrub, and Joshua tree woodland at an elevation of 550 to 1,525 m (1,800 to 5,000 feet). They prefer open terrain with loose, sandy soils and avoid steeply sloped or rocky terrain. Burrows are used for shelter, nesting, and periods of dormancy (Brylski et al. 1994).

Mohave ground squirrels are diurnal and are active aboveground in the spring and in the early summer. They begin a period of dormancy in July or August, which continues until they emerge in February and March (Zeiner et al. 1990b). The Mohave ground squirrel shares its range with the white-tailed antelope ground squirrel (*Ammospermophilus leucurus*), which is smaller and does not go into dormancy (Brylski 1994).

Agricultural conversion of native habitat has resulted in the loss of occupied and potential habitat between the Antelope Valley, Lucerne Valley, and Mojave River Basin. Although the Mohave ground squirrel likely occupied the Antelope Valley historically, widespread conversion of native habitat has apparently extirpated the species from areas west of the cities of Palmdale and Lancaster (California Department of Fish and Game 2005). Scott Harris from DFG stated that the current range of the Mohave ground squirrel occurs east of State Route 14 and that the Project area is not within the squirrel's current range (Harris pers. comm.). There are no CNDDDB records of Mohave ground squirrel within 10 miles of the Project area.

### **Small-Footed Myotis**

The small-footed myotis (*Myotis leibii*) is designated as a federal species of concern. The species is common in arid uplands habitats in California. In desert habitats, this species ranges from Modoc County south to Kern and San

Bernardino Counties (Zeiner et al. 1990b). The species inhabits a variety of habitats including desert scrub, grasslands, oak and pinyon-juniper woodlands, and pine forests. Roost sites have been found in mines and in trees (Brown and Pierson 1996). This species feeds on a variety of small flying insects and is often forages for flying insects among trees and over water (Zeiner et al. 1990b).

Abandoned and seldom-used buildings and Joshua trees located throughout the Project area provide suitable roosting habitat for small-footed myotis. However, CNDDDB (2005) did not have any small-footed myotis records within 10 miles of the Project area, and none was observed during the reconnaissance field visit.

### **Southern Grasshopper Mouse**

The southern grasshopper mouse (*Onychomys torridus ramona*) is designated as a federal species of concern and a California species of special concern. The species range includes the desert regions of southern California, especially sandy areas of the Mojave Desert and Sonora Desert and parts of the San Joaquin Valley. Grasshopper mice feed almost exclusively on arthropods, especially grasshoppers, crickets, and scorpions. Predators include raptors, snakes, and predatory mammals. This species is considered beneficial to farmers because they eat potentially harmful insects (Zeiner et al. 1990b).

The area proposed for the recharge basins does not provide suitable habitat. Annual grassland and rabbitbrush habitats throughout the Project area provide suitable habitat for southern grasshopper mice. However, CNDDDB (2005) did not have any southern grasshopper mice records within 10 miles of the Project area, and none was observed during the reconnaissance field visit.

## **Regulatory Framework**

### **Federal Regulations**

#### **Federal Endangered Species Act**

The federal ESA protects plant, fish and wildlife species, and their habitats, that have been identified by the USFWS or the National Oceanographic and Atmospheric Administration (NOAA) Fisheries as threatened or endangered. *Endangered* refers to species, subspecies, or distinct population segments that are in danger of extinction through all or a significant portion of their range; *threatened* refers to species, subspecies, or distinct population segments that are likely to become endangered in the near future. Mountain plovers, a species that has been proposed to be listed as federally threatened, may forage in agriculture fields located throughout the Project area in the winter months.

#### **Migratory Bird Treaty Act**

The MBTA (Title 16, United States Code [USC], Part 703) enacts the provisions of treaties between the United States, Great Britain, Mexico, Japan, and the Soviet Union and authorizes the U.S. Secretary of the Interior to protect and regulate the taking of migratory birds. It establishes seasons and bag limits for hunted species and protects migratory birds, their occupied nests, and their eggs

(16 USC 703, 50 CFR 21, 50 CFR 10). Most actions that result in taking or in permanent or temporary possession of a protected species constitute violations of MBTA. USFWS is responsible for overseeing compliance with MBTA. Bird species and their nest that occurs within the proposed Project area would be protected under the MBTA.

### **Clean Water Act**

The federal Clean Water Act was enacted as an amendment to the federal Water Pollution Control Act of 1972, which outlined the basic structure for regulating discharges of pollutants to waters of the United States. The Clean Water Act now serves as the primary federal law protecting the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands.

The Clean Water Act empowers the U.S. Environmental Protection Agency (EPA) to set national water quality standards and effluent limitations and includes programs addressing both point-source and nonpoint-source pollution. *Point-source pollution* is pollution that originates or enters surface waters at a single, discrete location, such as an outfall structure or an excavation or construction site. *Nonpoint-source pollution* originates over a broader area and includes urban contaminants in stormwater runoff and sediment loading from upstream areas. The Clean Water Act operates on the principle that all discharges into the nation's waters are unlawful unless specifically authorized by a permit; permit review is the Clean Water Act's primary regulatory tool.

The following paragraphs provide additional details on specific sections of the Clean Water Act.

### ***Permits for Fill Placement in Waters and Wetlands (Section 404)***

The Clean Water Act, Section 404, regulates the discharge of dredged and fill materials into waters of the United States. *Waters of the United States* refers to oceans, bays, rivers, streams, lakes, ponds, and wetlands, including areas within the Ordinary High Water Mark of a stream, such as nonperennial streams with a defined bed and bank and any stream channel that conveys natural runoff, even if it has been realigned; as well as seasonal and perennial wetlands, including coastal wetlands.

Applicants must obtain a permit from the Corps for all discharges of dredged or fill material into waters of the United States, including wetlands, before proceeding with a proposed activity. As stated by the Counsel for EPA's January 19, 2001, determination in response to the *Solid Waste Agency of Northern Cook County vs. United States Army Corps of Engineers* ruling, nonnavigable, isolated waters may not be regulated by the Corps. As part of the wetland delineation and verification process, the Corps will determine whether the wetlands in the study area are isolated and therefore not regulated under Section 404 of the Clean Water Act.

The Corps may issue either an individual permit evaluated on a case-by-case basis or a general permit evaluated at a program level for a series of related activities. General permits are preauthorized and are issued to cover multiple instances of similar activities expected to cause only minimal adverse

environmental effects. Nationwide Permits (NWP) are a type of general permit issued to cover particular fill activities. Each NWP specifies particular conditions that must be met in order for the NWP to apply to a particular project. Waters of the United States in the Project corridor are under the jurisdiction of the Corps' Sacramento District.

Compliance with Clean Water Act Section 404 requires compliance with several other environmental laws and regulations. The CORPS cannot issue an individual permit or verify the use of a general permit until the requirements of the National Environmental Policy Act (NEPA), ESA, and the National Historic Preservation Act (see Section 4.4, "Cultural Resources") have been met. In addition, the CORPS cannot issue or verify any permit until a water quality certification, or a waiver of certification, has been issued pursuant to the Clean Water Act, Section 401. The ephemeral drainages within the Project area are isolated and therefore would not be subject to Section 401 of the Clean Water Act (Allen pers. comm.)

#### ***Permits for Stormwater Discharge (Section 402)***

Section 402 of the Clean Water Act regulates construction-related stormwater discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) program, administered by the EPA. In California, the State Water Board is authorized by the EPA to oversee the NPDES program through Regional Water Quality Control Boards (see the related discussion under the subsection "State Water Resources Control Board," below).

NPDES permits are required for projects that disturb more than 1 acre of land. The NPDES permitting process requires the applicant to file a public notice of intent to discharge stormwater and to prepare and implement a stormwater pollution prevention plan (SWPPP). The SWPPP includes a site map and a description of proposed construction activities. In addition, it describes the Best Management Practices (BMPs) that would be implemented to prevent soil erosion and discharge of other construction-related pollutants (e.g., petroleum products, solvents, paints, cement) that could contaminate nearby water resources. Permittees are required to conduct annual monitoring and reporting to ensure that BMPs are correctly implemented and effective in controlling the discharge of stormwater-related pollutants.

#### ***Water Quality Certification (Section 401)***

Under the Clean Water Act, Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification from the state in which the discharge would originate, or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate. Therefore, all projects that have a federal component and may affect state water quality (including projects that require federal agency approval, such as issuance of a Section 404 permit) must also comply with Clean Water Act Section 401.



## State Regulations

### California Environmental Quality Act

CEQA is the regulatory framework by which California public agencies identify and mitigate significant environmental impacts. A project normally has a significant environmental impact on biological resources if it substantially affects a rare or endangered species or the habitat of that species; substantially interferes with the movement of resident or migratory fish or wildlife; or substantially diminishes habitat for fish, wildlife, or plants. The State CEQA Guidelines define rare, threatened, or endangered species as those listed under CESA and ESA, as well as any other species that meet the criteria of the resource agencies or local agencies—for example, the DFG-designated “species of special concern” and CNPS-listed species. The State CEQA Guidelines state that the lead agency preparing an EIR must consult with and receive written findings from the DFG concerning project impacts on species listed as endangered or threatened. The effects of a proposed project on these resources are important in determining whether the project has significant environmental impacts under CEQA.

### California Endangered Species Act

The CESA protects wildlife and plants listed as threatened and endangered by the California Fish and Game Commission. CESA prohibits *take* of state-listed wildlife and plants and requires an incidental take permit for authorization of take. The California Department of Fish and Game Code defines *take* as any action or attempt to “hunt, pursue, catch, capture, or kill.” The requirements for an application for an incidental take permit under CESA are described in Section 2081 of the California Fish and Game Code and in final adopted regulations for implementing Sections 2080 and 2081. Incidental take may also be authorized if the state-listed species is also listed under ESA (2080.1) or is part of an approved Natural Community Conservation Plan (NCCP) (2835). Regarding rare plant species, CESA defers to the California Native Plant Protection Act of 1977, which prohibits importing rare and endangered plants into California, taking rare and endangered plants, and selling rare and endangered plants. State-listed plants are protected mainly in cases where state agencies are involved in projects under CEQA. In these cases, plants listed as rare under the California Native Plant Protection Act are not protected under CESA but can be protected under CEQA. Swainson’s hawks, which are state listed as threatened, could nest and forage within or in the vicinity of the Project area. Swainson’s hawks and their nests are protected by the California Endangered Species Act.

### California Department of Fish and Game Codes

#### ***Fully Protected Species***

The California Fish and Game Code provides protection from take for a variety of species, referred to as *fully protected species*. Section 5050 lists protected amphibians and reptiles. Section 5515 prohibits take of fully protected fish species. Section 3511 prohibits take of fully protected bird species. Fully protected mammals are protected under Section 4700. The California Fish and Game Code defines *take* as “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.” Except for take related to scientific research, all take of fully protected species is prohibited. White-tailed kites are a

fully protected species that could nest and forage within and in the vicinity of the Project area.

#### ***Protection of Birds and Nests***

Section 3503 of the California Fish and Game Code prohibits the killing of birds or the destruction of bird nests. Section 3503.5 prohibits the killing of raptor species and the destruction of raptor nests. Many bird species could potentially nest within or in the vicinity of the Project area. These nests would be protected under these sections of the Fish and Game Code.

#### ***Streambed Alteration***

Under Sections 1600–1607 of the California Fish and Game Code, the DFG has jurisdictional authority over rivers, streams, and lakes from which fish and wildlife derive benefit. Under Section 1602, DFG regulates projects that will 1) divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake designated by the department in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit; 2) use material from the streambeds designated by the department; or 3) result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake designated by the department. A proponent of a project that has the potential to affect a stream- or lakebed is required to notify the DFG of the proposed activity.

The ephemeral drainages within the Project area are likely to meet the California Fish and Game Code's definition of a stream and would be subject to Fish and Game Code section 1602, which requires any person, state or local governmental agency, or public utility to notify DFG before beginning any activity that will substantially modify a river, stream, or lake. It is likely that DFG will require a lake or streambed alteration agreement for construction across these drainages.

#### ***State Water Resources Control Board***

Section 13260(a) of the Porter-Cologne Water Quality Control Act (contained in the California Water Code) requires any person discharging waste or proposing to discharge waste, other than to a community sewer system, within any region that could affect the quality of the waters of the State to file a report of waste discharge (ROWD). The discharge of dredged or fill material may constitute a discharge of waste that could affect the quality of waters of the State.

Historically, California relied upon its authority under Section 401 of the federal Clean Water Act to regulate discharges of dredged or fill material to California waters. That section requires an applicant to obtain "water quality certification" from the State Water Board through its regional water quality control boards to ensure compliance with state water quality standards before certain federal licenses or permits may be issued. The permits subject to Section 401 include permits for the discharge of dredged or fill materials (Clean Water Act Section 404 permits) issued by the Corps. Waste discharge requirements under the Porter-Cologne Water Quality Control Act were typically waived for projects that required certification.

In 2004, the State Water Board issued Water Quality Order No. 2004-004-DWQ. This order addresses general waste discharge requirements (general

WDRs) for discharges of dredged or fill material to waters deemed by the Corps to be outside its jurisdiction and therefore not subject to Section 404 of the Clean Water Act. In general, these are waters found to be “isolated.” These general WDRs are restricted to discharges of less than 0.2 acre. If a discharge does not qualify for general WDRs, a ROWD must be filed using a 401 Certification Application. Because the impacts on the ephemeral drainages within the Project area would be temporary and less than 0.2 acre of land, a ROWD would not need to be filed.

## **Local Regulations**

### **Kern County General Plan**

The Kern County General Plan, adopted on June 15, 2004, contains the following policies to protect threatened and endangered species.

#### ***Land Use/Conservation/Open Space Element Threatened and Endangered Species***

##### **■ Policies**

- Threatened or endangered plant and wildlife species should be protected in accordance with state and federal laws.
- County should work closely with state and federal agencies to assure that discretionary projects avoid or minimize impacts to fish, wildlife, and botanical resources.
- The County will seek cooperative efforts with local, state, and federal agencies to protect listed threatened and endangered plant and wildlife species through the use of conservation plans and other methods promoting management and conservation of habitat lands.
- Under the provisions of the California Environmental Quality Act, the County, as lead agency, will solicit comments from the California Department of Fish and Game and the U.S. Fish and Wildlife Service when an environmental document (Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report) is prepared.

##### **■ Implementation Measures**

- Discretionary projects shall consider effects to biological resources as required by the California Environmental Quality Act.
- Consult and consider the comments from responsible and trustee wildlife agencies when reviewing a discretionary project subject to the California Environment Quality Act.

#### ***Oak Tree Conservation***

##### **■ Policies**

- Oak woodlands and large oak trees shall be protected where possible and incorporated into project developments.

***Willow Springs Specific Plan***

Relevant goals, policies, and mitigation/implementation measures from the Willow Springs Specific Plan are provided below.

***Resource Element*****■ Goals**

- To achieve compatibility of adjacent land uses within the plan area.

**■ Policies**

To ensure compliance with applicable state and federal laws and to protect the biological resources present in the Specific Plan area.

**■ Mitigation/Implementation Measures**

- Where possible, project development within the Specific Plan Update area shall be designed to avoid displacement or destruction of Joshua tree habitat, to the satisfaction of the Kern County Agricultural Commissioner's Office. Areas adjacent to the woodland shall have a 50-foot setback from the Joshua tree plants. Within that setback, a native plant cover should be restored to natural habitat values to serve as a buffer, if such plant cover is not present.
- A Joshua Tree Preservation and Transportation Plan shall be developed by the applicants for each parcel where Joshua trees are located on site. The plan shall be submitted to the Kern County Agricultural Commissioner's Office for review and approval prior to grading permit issuance.
- Prior to tentative tract map approvals or additional development plan approvals, focused surveys shall be conducted by a qualified biologist (subject to the approval of the California Department of Fish and Game and the U.S. Fish and Wildlife Service) to establish the presence or absence of sensitive plant or wildlife species on the tract. Should sensitive species be present, applicable mitigation shall be implemented per federal, state, and local Endangered Species Protection regulations, as determined necessary by the County Agricultural Commissioner.
- Initial development within the Willow Springs Specific Plan Update area shall, when possible, be directed towards previously impacted areas (i.e., agricultural fields). Portions of the plan area with native vegetation, especially along the northern and western borders, shall be developed in the later phases of project buildout.
- Project site plans shall be encouraged by the County Agricultural Commissioner to be designed to preserve shrub communities where the LeConte's thrasher is known to be located, in accordance with state and federal regulations.
- Although there is a low potential for the occurrence of desert tortoise in the Specific Plan area, desert tortoises may occur on site. If tortoises are discovered during subsequent surveys, the State Department of Fish and

Game and the U.S. Fish and Wildlife Service shall be contacted immediately.

- A Joshua Tree Preservation and/or Transplantation Plan shall be developed by the applicants of discretionary projects for each parcel where Joshua trees are located on site. The plan shall be submitted to the Kern County Agricultural Commissioner for review and approval prior to grading permit issuance.

### ***West Mojave Habitat Conservation Plan***

The West Mojave Plan is a habitat conservation plan, being processed by Kern and San Bernardino Counties with the City of Barstow, Lancaster, and Palmdale along with two other counties (Los Angeles and Inyo) and 12 other cities. In conjunction with a complimentary federal land use plan amendment, it presents a comprehensive strategy to conserve and protect the desert tortoise, the Mohave ground squirrel, and more than 100 other sensitive plants and animals. After approval by USFWS and DFG and the issuance of a 10a and 2081 permit, a mitigation strategy will be implemented that includes a mitigation fee paid prior to grading activities that will be used for acquisition of habitat and specific activities to benefit the identified species.

Wildlife species that are addressed in this EIR and the West Mojave Plan include: desert tortoise, Mohave ground squirrel, the California horned lizard, burrowing owl, Le Conte's thrasher, and bats (myotis) (BLM 2005).

The West Mojave Plan lists the following biological goals with regard to these wildlife species:

- to conserve unfragmented habitat for California horned lizards within the range,
- to prevent direct incidental take and protect and enhance known populations of burrowing owls on public lands,
- to protect and enhance known populations and habitat of Le Conte's thrasher, and
- to maintain and enhance the viability of all bat populations, regardless of the species.

Activities on agricultural lands are not covered under the West Mojave Habitat Conservation Plan, but construction of the pipeline conveyances could be.

### **Los Angeles County General Plan**

The Los Angeles County General Plan policy mandates the conservation of SEAs in as viable and natural a condition as possible without treating them as preserves and prohibiting development (County of Los Angeles 2004).

The Los Angeles County Zoning Ordinance currently contains a procedure for reviewing development proposals that are located on a parcel within or partially within an SEA. The SEA process is triggered by an application for a building or

grading permit. The intent of this procedure is not to preclude development, but to allow limited controlled development that does not jeopardize the remaining biotic resources of SEAs. This procedure exempts certain developments from the SEA provisions but subjects other developments to a high degree of review through the conditional use permit (CUP) process, including review by the Significant Ecological Area Technical Advisory Committee (SEATAC) (County of Los Angeles 2004).

Types of developments subject to a CUP include:

- major land divisions (5 or more lots),
- small subdivisions that do not meet Minor CUP Development Standards,
- grading on land with a slope of 25 percent or greater or in an amount exceeding 10,000 cubic yards, and
- vegetation removal greater than 2.5 acres and 20 percent or greater of gross project area.

The Joshua Tree Woodland habitat type located within the new delivery pipeline area has been designated an SEA by Los Angeles County (Figure 4.3-1b). Because the impacts on the Joshua Tree Woodland habitat type could be up to 19 acres but the Joshua Tree Woodland habitat type is less than 20 percent of the gross project area, the development would not be subject to the CUP provisions of this particular ordinance.

The following are relevant goals and policies from the Los Angeles County General Plan.

*Conservation, Open Space, and Recreation, Ecological Resources*

■ **Goal**

To preserve and protect prime agricultural lands, forests, fisheries, significant ecological areas, and other biotic resources.

■ **Policies**

- Preserve significant ecological areas by appropriate measures, including preservation, mitigation, and enhancement.

***Antelope Valley Areawide General Plan***

Relevant goals, policies, and mitigation/implementation measures from the Antelope Valley Areawide General Plan are provided below.

*Land Use/Environmental Sensitivities*

■ **Policies**

- Designate significant plant and wildlife habitats in the Antelope Valley as “Significant Ecological Areas” (SEAs), and establish appropriate measures for their protection.

- Encourage public agencies, and particularly the Bureau of Land Management, to retain present holdings in or contiguous to SEAs in the Antelope Valley.

#### *Environmental Resource Management/Rare and Unique Natural Areas*

##### ■ **Polices**

- Preserve the Antelope Valley's SEAs in as viable and natural a condition as possible, recognizing the resource values at stake and the constraints imposed by competing priorities and objectives.
- Encourage development to utilize and enhance natural topographic features, thus establishing harmony between the natural and manmade environment.

## **Impact Analysis**

This section describes the CEQA impact analysis relating to biological resource issues for the proposed Project and its phases. It describes the methods used to determine the proposed Project's impacts and lists the thresholds used to conclude whether an impact could be significant. Measures to mitigate (avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion.

## **Methodology**

The potential effects of the proposed Project on biological resources were assessed based on a review of the proposed Project layout.

Biological resources could be directly or indirectly affected by construction of the Project. The following types of activities could cause varying degrees of impacts on biological resources in the Project area:

- vegetation removal, grading, and trenching activities during construction of the recharge and recovery facilities and the installation of the new delivery pipeline;
- temporary stockpiling and sidecasting of soil, construction materials, or other construction wastes;
- soil compaction, dust, and water runoff from the construction site into adjacent areas;
- periodic, temporary conversion of agricultural fields to open-water ponds during recharge operations; and
- operations and maintenance activities.

In assessing the magnitude of possible impacts, the following assumptions were made regarding Project construction.

- The proposed action would result in temporary and permanent impacts on biological resources in the Project area. Temporary impacts would occur only during the construction period, and would be within temporary equipment staging and equipment movement areas and the alignment of the new delivery pipeline. Permanent impacts include irreversible changes from the conversion of agricultural fields to open-water ponds. The permanent impact areas would include all areas within the Project footprint that are converted.
- Project impacts may be direct or indirect. Direct impacts would be within the Project footprint or temporary construction areas. Indirect impacts would occur outside of the Project footprint and construction area.

## Thresholds of Significance

The Kern County CEQA Implementation Document and Kern County Environmental Checklist state that a project would have a significant impact on biological resources if it would:

- have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations by the California Department of Fish and Game or U.S. Fish and Wildlife Service;
- have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;
- have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with the established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.



## Impacts and Mitigation Measures

### **Impact 4.3-1: Potential Loss or Temporary Disturbance of Annual Grassland and Agricultural Habitats**

Construction-related activities associated with the proposed Project would result in the loss or disturbance of annual grassland and agricultural habitats. This impact is considered less than significant because these habitats are locally and regionally common and consist of nonnative weedy plant species. In addition, the disturbed annual grassland and agricultural habitats are expected to reestablish naturally, following the completion of construction-related activities.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

### **Impact 4.3-2: Potential Temporary Disturbance of Rabbitbrush Scrub Habitat**

Construction-related activities associated with the proposed Project and occurring within existing rights-of-way would result in the temporary disturbance of rabbitbrush scrub habitat and roadside areas and could displace wildlife using these areas. These impacts are considered less than significant because rabbitbrush scrub habitat and roadside areas are common both locally and regionally. In addition, the disturbed rabbitbrush scrub habitats are expected to reestablish naturally following the completion of construction-related activities.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

### **Impact 4.3-3: Potential Loss or Temporary Disturbance of up to 19 Acres of Joshua Tree Woodland Habitat**

Construction-related activities for the new delivery pipeline could impact up to 19 acres of Joshua Tree Woodland habitat, including individual Joshua trees along the Project corridor in Los Angeles County. The number of Joshua trees that would be removed or disturbed during construction is unknown at this time. This potential impact is considered significant because the proposed Project could have a substantial adverse effect on this sensitive natural community that has been identified in local or regional plans.

#### **Mitigation Measures**

**Mitigation Measure 4.3-1:** Impacts on the Joshua Tree Woodland habitat shall be minimized to the extent possible during the design phase by making minor

adjustments to the corridor width to avoid Joshua trees. A corridor plan shall be developed showing the location of all Joshua trees and, after review and recommendation by a qualified biologist, trees to be avoided are to be clearly identified.

**Mitigation Measure 4.3-2:** Joshua tree woodland habitat located in or adjacent to the construction corridor or site will be protected by placing orange construction barrier fencing or stakes and flags, including buffer zones where appropriate. The locations of these resources will be clearly identified on the construction drawings and marked in the field by the environmental monitor. Fencing or other barriers will remain in place until all construction and restoration work that involves heavy equipment is complete. Construction vehicles, equipment, or materials will not be parked or stored within the fenced area. No signs, ropes, cables, or other items will be attached to individual Joshua trees.

**Level of Significance after Mitigation:** Less than significant.

#### **Impact 4.3-4: Temporary Disturbance of 0.19 Acre of Ephemeral Drainages**

Construction-related activities associated with the new delivery pipeline could result in the temporary disturbance of approximately 0.19 acre of ephemeral drainages that cross the Project corridor in Los Angeles County (Figure 4.3-1b). Although the proposed Project would disturb these ephemeral drainages, impacts on the drainages would be temporary because construction activities would not significantly alter the drainages hydrologic functions. In addition, the time required to place the pipeline would be relatively short and natural landscape contours would be reestablished during postconstruction activities. Further impacts on ephemeral drainages will be minimized by limiting construction activities in ephemeral drainages to the dry season. In addition, a streambed alteration agreement with the DFG will be initiated.

Additionally, excavated material will be placed in a manner that prevents the material from being dispersed by currents or other forces, and the disturbed area will be restricted to the minimum area necessary to construct the pipeline. Excess material will be removed to upland areas immediately on completion of construction, and exposed slopes will be stabilized immediately on completion of the pipeline.

Nonetheless, this impact is considered significant because the Project could have a substantial adverse effect on this sensitive natural community identified in local and regional plans, policies, regulations, or by the DFG. Specifically, isolated drainages provide important habitat functions and are subject to DFG regulation under California Fish and Game Code Sections 1601-1607.

#### **Mitigation Measure**

**Mitigation Measure 4.3-3:** Prior to any work in or near ephemeral drainages, the applicant will apply to DFG for a streambed alteration agreement and to the Lahontan Regional Water Quality Control Board for a water quality certification or waiver and will abide by any measures that those agencies may impose.

**Level of Significance after Mitigation:** Less than significant.

### **Impact 4.3-5: Potential Loss or Disturbance of Swainson's Hawk Nests during Construction**

A review of the CNDDDB records (2005) indicated two Swainson's hawk nest occurrences approximately 5 miles southeast of the area for the proposed recharge basins. These nests occurrences were recorded in 1995 and 1999. The Swainson's hawk nesting population in the Antelope Valley is small. Only a couple of pairs of Swainson's hawks have been known to nest in the Antelope Valley (DFG 1994, CNDDDB 2005). Numerous large trees are located within and around the periphery of the area for the proposed recharge basins and recovery wells. The trees could be used as nesting habitat for Swainson's hawks. A large unoccupied raptor nest was observed in a conifer tree at the northeast corner of the area for the proposed recharge basins, but the raptor species could not be identified.

Construction activities, such as earthmoving with heavy construction equipment occurring within the area for the proposed recharge basins could cause the failure of a Swainson's hawk nest, if a pair were nesting in the vicinity. The loss of an active Swainson's hawk nest could contribute to continuing local and statewide declines of Swainson's hawks. Because the number of Swainson's hawks that nest in the Antelope Valley is very small, the loss of even one nest could be significant because it could have a substantial adverse effect, either directly or through habitat removal, on a species identified as a special-status species by the DFG or the USFWS.

#### **Mitigation Measure**

**Mitigation Measure 4.3-4:** If construction activities occur during the Swainson's hawk nesting season (March 1–September 15), the Project will provide a qualified biologist to conduct preconstruction surveys to locate all active nest sites within 0.5 mile of the construction area.

If occupied Swainson's hawk nests are found, the Project, in consultation with DFG, shall establish a buffer zone around active Swainson's hawk nests in the vicinity of the Project area. The buffer zone shall be marked with specific identifiable flagging or fencing. Construction activities shall be restricted from the buffer around the active nests until after chicks have fledged.

Whenever construction occurs within 0.25 mile of an active nest, a biological monitor shall observe the nesting hawks for stressed/detrimental behavior that threatens nest success. If there appears to be a threat to nesting success resulting

from construction activity within the 0.25-mile buffer, work shall be halted until the hawk's behavior normalizes. The most obvious and dangerous "detrimental behavior" occurs when the hawk is scared off the nest. If that occurs (even momentarily), construction shall stop immediately within 0.25 mile of the nest for at least 1 hour after the hawk returns to the nest and her behavior appears to normalize. When construction resumes, if the hawk is scared off the nest a second time, construction will be prohibited within that 0.25-mile zone until having consulted with DFG to discuss further options. Other stressors/detrimental behaviors that the monitor shall look for include the hawk being off the eggs while still on the nest (e.g., circling/walking around the nest and calling). The biological monitor shall also watch for signs that the hawks are paying attention to construction instead of behaving normally (e.g., sitting calmly on the nest, watching out for or scaring away potential predators).

**Level of Significance after Mitigation:** Less than significant.

#### **Impact 4.3-6: Potential Disturbance of Nesting Swainson's Hawks as a Result of Project Operations and Maintenance**

Once the recharge basins and recovery wells are constructed, the surface water would percolate through the subsurface for storage. Recharge activities would occur primarily during the winter months, outside of the Swainson's hawk nesting season. When needed, mostly during the spring and summer months, the stored water would be recovered using groundwater wells. This would coincide with the nesting period for Swainson's hawks. The pumps that would be used to recover the stored water would be like those that are used throughout the region by farmers. The use of the pumps would have a less-than-significant effect on nesting Swainson's hawks.

When the recharge basins are not required for recharge activities, the basins would be used for organic farming. The operation activities (use of farm equipment, irrigation, etc.) would be like other farms in the region. The operation of the organic farm would occur during the nesting season of Swainson's hawks and the fields would provide foraging habitat. Activities associated with organic farming would have a less-than-significant effect on nesting Swainson's hawks.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

#### **Impact 4.3-7: Potential Loss or Disturbance of Burrowing Owl Nests and Burrows during Construction**

A review of the CNDDDB (2005) indicated two burrowing owl records within 5 miles of the Project area. Both of these records were from 1999. The number of

nesting burrowing owls in the Antelope Valley is low (CNDDDB 2005 and DFG 1995). The shoulders of roads, larger dirt mounds and berms, and other open areas provide suitable habitat for burrowing owls, especially where ground squirrel burrows and open culverts occur. Construction activities, such as excavation and driving off road could result in the removal of active nests, if construction occurs during the nesting season (February 1 through August 31) and occupied burrows during the non-breeding season (September 1 through January 31). Because the numbers of burrowing owls nesting in the Antelope Valley is low, the loss of one nest or one occupied burrow could be a significant impact because it could have a substantial adverse effect, either directly or through habitat removal, on a species identified as a special-status species by the DFG or the USFWS.

### **Mitigation Measures**

***Mitigation Measure 4.3-5:*** Preconstruction surveys shall be conducted by a qualified biologist within the work area and a 250-foot buffer to locate active burrowing owl burrows. The Project will provide a qualified biologist to conduct these preconstruction surveys for active burrows according to DFG guidelines. The preconstruction surveys will include a nesting season survey and a wintering season survey the season immediately preceding construction. If no burrowing owls are detected, no further mitigation is required.

***Mitigation Measure 4.3-6:*** If burrowing owls are detected within 250 feet of proposed construction within the Project area, the following measures will be implemented.

- Occupied burrows will not be disturbed during the nesting season (February 1–August 31).
- When destruction of occupied burrows is unavoidable during the non-nesting season (September 1–January 31), unsuitable burrows will be enhanced (enlarged or cleared of debris).
- If owls must be moved away from the Project area, passive relocation techniques (e.g., installing one-way doors at burrow entrances) will be used instead of trapping. At least 1 week will be necessary to accomplish passive relocation and allow owls to acclimate to alternate burrows.
- If avoidance is the preferred method of dealing with potential impacts, no disturbance should occur within 160 feet of occupied burrows during the non-breeding season (September 1–January 31) or within 250 feet during the breeding season.

**Level of Significance after Mitigation:** Less than significant.

### **Impact 4.3-8: Potential Disturbance of Burrowing Owl Nests as a Result of Project Operations and Maintenance**

Recharge activities would occur primarily during the winter months, outside of the burrowing owl nesting season. When needed, mostly during the spring and summer months, the stored water would be recovered using groundwater wells. This would coincide with the nesting period for burrowing owls. The pumps that would be used to recover the stored water would be like those that are used throughout the region by farmers. The use of the pumps is expected to have a less-than-significant effect on nesting burrowing owls.

When the recharge basins are not required for recharge activities, the basins would be used for organic farming. The operation activities of the organic farm would be like those on other farms in the region except that pesticides would not be used. The operation of the organic farm would occur during the nesting season of burrowing owls and could be beneficial because the fields would provide foraging habitat.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

### **Impact 4.3-9: Potential Disturbance to Special-Status Bird Nests during Construction**

Examination of existing data from the CNDDDB (2005) and other sources, as well as field surveys, indicate the presence of suitable nesting habitat for several species of special-status birds, including loggerhead shrikes, horned larks, Le Conte's thrashers, and white-tailed kites. Loggerhead shrikes and white-tailed kites could utilize many of the trees located throughout the area for the proposed recharge basins and recovery wells as nesting habitat. Rabbitbrush shrubs and other shrubs located in the throughout the Project area could provide nesting habitat for Le Conte's thrashers. Horned larks could nest in open areas located throughout the Project area.

Disturbances of nest sites may cause nest failure or a reduction of available nesting habitat, potentially contributing to local and regional declines of these species. This impact is considered significant because it could have a substantial adverse effect, either directly or through habitat removal, on a species identified as a special-status species by the DFG or the USFWS.

#### **Mitigation Measure**

**Mitigation Measure 4.3-7:** A qualified biologist shall conduct preconstruction surveys each construction year to locate all active nest sites within 0.25 mile of the Project area.

Direct disturbance, including activities in the immediate vicinity of active nests, shall be avoided during the breeding season (March through August) where feasible. No-disturbance buffers shall be established around each active nest to avoid disturbing nesting birds where feasible. The size and configuration of buffers shall be based on the proximity of active nests to construction, existing disturbance levels, topography, the sensitivity of the species, and other factors, and shall be established through coordination with DFG representatives on a case-by-case basis. Where it is determined to be infeasible to schedule construction to avoid constructing within 300 feet of an active nest, the Project shall monitor nest status to determine whether construction is disturbing nesting activities. If it is determined by a qualified biologist that the construction is adversely affecting nesting activities, construction within 300 feet shall cease pending completion of nesting activities.

**Level of Significance after Mitigation:** Less than significant.

#### **Impact 4.3-10: Potential Loss of Foraging Habitat for Mountain Plovers and Long-Billed Curlews as a Result of the Recharge Basins**

Construction of the ponds could result in the loss of potential foraging habitat for mountain plovers and long-billed curlews. These birds do not nest in the Antelope Valley but utilize agricultural fields for foraging and resting during the non-breeding season. Foraging habitat could be impacted by the Project; however, surrounding agricultural fields would continue to provide suitable foraging habitat. Additionally, these species are highly mobile, and no direct mortality is anticipated from the indirect impact of losing available foraging habitat as a result of this habitat conversion. Therefore, this impact is less than significant because it would not have a substantial adverse effect, either directly or through habitat removal, on a species identified as a special-status species by the DFG or the USFWS.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

#### **Impact 4.3-11: Potential Impacts on California Horned Lizards and California Legless Lizards during Construction**

A review of the CNDDDB (2005) indicated horned lizard occurrences near the proposed delivery pipeline and one horned lizard was observed at the southern end of the proposed delivery pipeline during the reconnaissance field visit. California legless lizards have not been recorded from the Project area but have been recorded 5 miles west of Lancaster (CNDDDB 2005). Annual grassland and rabbitbrush habitats throughout the Project areas provide suitable habitat for California horned lizards and California legless lizards. Construction activities in

these habitats, especially digging and trenching, could negatively impact California horned lizards and/or California legless lizards. Additionally, these species could become trapped in trenches that are left open overnight. The number of these animals that the Project could negatively impact is unknown. However, the area that would be impacted would be small compared to the amount of habitat that is available.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

### **Impact 4.3-12: Potential Disturbance to Roosting Bats during Construction of Recharge Basins**

Construction of the proposed Project would not remove buildings and trees located within the area for the proposed recharge basins. Some Joshua trees located within the alignment of the proposed delivery pipeline may be removed. Though it has not been reported, special-status bat species, such as fringed myotis bat and small-footed myotis bat, may use Joshua trees for day roosting. Roosting bats, especially fringed myotis, are easily disturbed. Disturbance of a roosting site could cause the abandonment of that site and may result in the death of the individual bats. However, this impact is considered less than significant because disturbance of roosting sites would not have a substantial adverse effect, either directly or through habitat modification, on a species identified as a special-status species by the DFG or USFWS.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

### **Impacts 4.3-13: Potential Impacts on American Badger and Southern Grasshopper Mouse during Construction of Phase 2 Delivery Pipeline**

A review of the CNDDDB (2005) indicated American badger occurrences in the vicinity of the Project area. Annual grassland and rabbitbrush habitats throughout the Project area provide suitable habitat for American badgers and southern grasshopper mice. Construction activities in these habitats, especially digging and trenching, could negatively impact badgers and/or grasshopper mice. Additionally, these species could become trapped in trenches that are left open overnight. The number of these animals that the Project could negatively impact is unknown. However, the area that would be impacted would be small compared to the amount of habitat that is available.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.



### **Impacts 4.3-14: Potential Impacts on Desert Tortoise and Mohave Ground Squirrel**

The Project area occurs outside the current ranges of the Mohave ground squirrel and desert tortoise. Agricultural conversion of native habitat in the Antelope Valley has degraded and eliminated suitable habitat for these two species. There are no CNDDDB records of the desert tortoise or the Mohave ground squirrel within 10 miles of the Project area. Therefore, construction of the proposed Project would not have any negative impacts on Mohave ground squirrels or desert tortoises.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

## **Cumulative Impact**

### **Impacts 4.3-15: Potential Cumulative Impacts**

Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The cumulative impact scenario for the Project includes seven specific projects identified by Kern and Los Angeles Counties, and buildout of the Kern County General Plan. A detailed description of the cumulative impact scenario considered with the proposed Project is provided in Chapter 3, "Project Description," and the project list is presented below.

A cumulative impact analysis first identifies whether a cumulatively significant impact exists in the given resource area. If so, it determines whether the project will make a considerable contribution to that impact. Where a cumulative impact is severe, even a small contribution may be considerable (Section 15130(b) of the State CEQA Guidelines).

**Table 4.3-3. Relevant Cumulative Projects**

Case Number (if applicable)	Project Name	Project Location	Approximate Distance to Project Site	Project Type	Project Description
<b>Kern County</b>					
GPA 1, Map 218	Tejon Mountain Village Specific Plan	East of I-5 in the hills north and east of Castaic Lake	14 miles northwest of project site	Major Residential/commercial/recreational development	3,450 single family units (s.f.u.) homes on 23,000-acre planning area,
GPA, Map 255	Lebec Canyon Estates	East of Frazier Mountain Park Road/I-5 interchange	22 miles west of project site	Residential development	32 s.f.u on 1,000 acres
SPA 8, Map 254, Amend. Zone Map 254, Zone Change 6, SP 1, Map 254, Vesting Tent. Tract 6436	Frazier Park Estates	Southern boundary of Kern Co. and portion of LA County, west of I-5 south of Frazier Mountain Park Road	24 miles west of project site	Residential / Commercial development	705 s.f.u. and 135 thousand sq. ft of commercial on 847 acres in Kern County and 323 in LA County
GPA to 5.7, Map 215	Christine Bower	One quarter mile west of 105 <sup>th</sup> Street and McConnell Road near Rosamond	3 miles north of project site	General Plan Amendment and Zone	4 s.f.u on 20-acre site
ZC to A-1, Map 231	Julien and Assoc.	8684 Sweetser Road, Rosamond (APN 315-081-09)	3-1/2 miles northeast of project site	Commercial greenhouses	60-acre site
<b>Los Angeles County</b>					
N/A	Centennial Specific Plan	1 mile east of I-5, adjacent to SR-138	12 miles southwest of project site	Large-scale new community; including residential/commercial development	23,000 dwelling units and 14 million sq. ft. commercial on 11,700 acres
N/A	Gorman Ranch	Gorman Post Road, north of SR-138, east of I-5	17 miles southeast of project site	Residential	227 s.f.u. on 2,500 acres

Because of the Project's proximity to rapidly growing urban centers, demand for development is increasing in the Project area. Continued development in the region and the conversion of native habitat to urban uses represent a significant cumulative impact on wildlife habitats.

### **Kern County General Plan**

The draft Program EIR for the Kern County General Plan Update (July 2003) (GP PEIR) states the following:

“While the Kern County General Plan update goals, policies and implementation are sufficient to mitigate any impact to rare or endangered species of animal, plant or habitat of the species the cumulative impact of the reduction of quality habitat or the accidental "take" of individual plants or animal species is potentially significant. Impacts to habitat will continue to occur through urbanization, conversion of fallow land to agriculture, energy expansion, infrastructure development such as roads, utilities, sewer and water and secondary impacts from development, such as illegal dumping and domestic pets. The Kern County General Plan will require that individual projects mitigate their site specific impacts through the CEQA process, however the species may still lose habitat and decline in numbers for other reasons....Although the adoption of the Habitat Conservation Plans in preparation and the continued participation in the Metropolitan Bakersfield Habitat Conservation Plan will contribute to conservation of important habitat and minimization of take of individual plants and wildlife, other solutions remain out of the province of the county. No other feasible mitigation remains to address these broad regional, State, federal and scientific concerns.”

This is a *significant and unavoidable* impact according to the GP PEIR.

### **Relevant Projects**

The small local projects included in the cumulative scenario (including **Bower and Julien**) are not projects that would result in significant native habitat conversions because of their location and the relatively low quality habitat of the sites. The larger cumulative scenario projects in Kern and Los Angeles Counties (such as **Tejon Mountain Village Specific Plan and Centennial**) would contribute to the cumulative loss of quality habitat for plants and animals but also would allow for the long-term preservation of areas of significant quality habitat for certain species. None of the habitat or species associated with these projects is similar to those associated with the proposed Project, except for the Centennial project, which shares areas of ephemeral watercourses and rabbitbrush scrub habitat for the California horned lizard.

The proposed Project has the potential to temporarily disturb 0.19 acre of ephemeral watercourse (Biological Resources Impact 4.3-4), which is not enough to contribute to a significant cumulative impact in conjunction with the disturbance associated with the Centennial development (4.06 acres of ephemeral drainages), located many miles southwest of the Project site. In addition, Mitigation Measure 4.3-3 requires the applicant to obtain a streambed alteration agreement with the goal of impact avoidance.

As stated in Biological Resources Impact 4.3-2, because disturbance of the rabbitbrush scrub habitat is only temporary (will reestablish naturally) and this habitat is both locally and regionally common, the proposed Project will not contribute to a cumulative loss of this habitat.

Biological Resources Impact 4.3-11 discusses the Project's potential impact on California horned lizard, which is also a potential impact associated with the Centennial, the Bower and the Julien projects. Impacts on this species could be cumulatively considerable; however, the amount of disturbance associated with the proposed Project is minimal and temporary and, as previously stated, there is a vast amount of rabbitbrush scrub habitat in the area suitable for the species. Therefore, the project is not expected to contribute considerably to a significant cumulative effect on the California horned lizard.

Biological Resources Impact 4.3-3 describes the proposed Project's disturbance of up to 19 acres of Joshua tree woodland habitat in Los Angeles County associated with a pipeline route. Joshua trees are not present in the vicinity of the Tejon Mountain Village, Lebec Canyon Estates, Frazier Park Estates, Centennial, or Gorman Ranch projects. The Bower and the Julien projects, however, are located in an area where Joshua trees could be present. The applicant will implement mitigation measures to avoid and minimize these impacts. The impacts on Joshua tree woodland that are unavoidable would occur in previously disturbed habitat adjacent to the roadway. As such, the Project would not result in a considerable contribution to a *cumulative* impact on Joshua tree woodland habitat or any other biological resource.

**Mitigation Measure:**

Implementation of Mitigation Measures 4.3-1 (minimize impacts on Joshua tree woodland habitat during Project design phase), 4.3-2 (avoid or minimize impacts on Joshua tree woodland habitat before and after construction), 4.3-4 (minimize impacts on ephemeral drainages), 4.3-5 (conduct preconstruction surveys for active Swainson's hawk nests), 4.3-7 (conduct preconstruction surveys for burrowing owl burrows), and 4.3-9 (conduct surveys for nesting special status birds) will reduce impacts on plant and animal species associated with the Project site to a less-than-significant level. The Project, with mitigation, will not contribute considerably to a cumulative impact on biological resources.

**Level of Significance after Mitigation:** Cumulative impacts would be less than significant.

## 4.4 Cultural Resources

### Introduction

This section describes the cultural background and setting of the Project area, and provides the results of cultural resources surveys and analysis conducted for the Project. Potential impacts that could result from the Project on cultural resources, including prehistoric and historical archaeological sites and paleontologic discoveries, are discussed, and feasible mitigation measures are provided.

### Environmental Setting

The Project area is located in eastern Kern County and northern Los Angeles County, approximately 10 miles west of the unincorporated community of Rosamond in Kern County, and 17 miles northwest of the City of Lancaster in Los Angeles County. The Project area is located in Antelope Valley, a semiarid region with gently sloping land that borders the Mojave Desert. The Project site is situated in the alluvial plain of Cottonwood Creek, an ephemeral stream in the area. The vast majority of the Project area is underlain by younger Quaternary alluvial and alluvial fan deposits, but older Quaternary alluvium underlies areas on the south slopes of the Antelope Valley.

At present, only the areas proposed for the recharge basins and the Phase 2 delivery pipeline are available for cultural resources surveys. WDS has not yet finalized design of recovery wells and recovery pipelines. For this reason, this environmental impact report (EIR) divides the prehistoric and historical cultural resources analysis into areas that have been surveyed for cultural resources and into areas that will require survey for cultural resources in the future, as Project facilities are designed and land acquired. No surveys have been conducted for paleontological resources; rather, the paleontological sensitivity of the entire Project area has been assessed and mitigation measures offered.

### Cultural Setting

#### Prehistoric Background

This section provides a general overview of prehistoric, ethnographic, and historical periods in the southern California deserts. The discussion of the prehistoric cultural setting is based primarily on a time frame defined by Warren (1984) for the Mojave Desert.

**“Early Man Period”**

Several sites in the southern California deserts, the most well known of which is Calico Hills, have been tentatively assigned to the “Early Man Period” with relative dates ranging from 12,000 years ago to as far back as 50,000 years ago (Moratto 1984). Various geologic and experimental dating methods provide these extreme temporal assignments. Thus far, however, none of these “Early Man” sites has withstood scientific scrutiny. Despite claims for evidence of “Early Man” in the California deserts, it appears likely that humans first arrived in southern California about 12,000 years ago.

***Paleo-Indian Period (ca. 12,000–7,000 B.P. [ca. 10,000–5000 B.C.]***

The earliest humans to occupy North America were highly mobile hunters and gatherers. Paleo-Indian sites within southern California were assigned by Rogers (1966) to the San Dieguito Culture. Moratto (1984) divides assemblages of this early era into a Fluted Point tradition (12,000–10,000 B.P.) and a Western Pluvial Lakes Tradition (10,000–7,000 B.P.). Although fluted points have been recovered on the shoreline of Lake Mojave, northeast of the Project area, few have been documented in the Antelope Valley. For the most part, San Dieguito sites are often found on the margins of dry lakes and on mesas and terraces overlooking large washes. Lake Mojave and Silver Lake points are the typical point types found from this time period.

***Pinto Period (ca. 7,000–4,000 B.P. [ca. 5000–2000 B.C.]***

The Pinto Period is marked in general by the gradual transition from pluvial to arid conditions during the terminal Pleistocene–Early Holocene. However, at least one period of increased moisture, from approximately 6,500 to 5,500 years ago, resulted in the return of pluvial lake conditions. Warren (1984) postulates that human occupation of the southern California deserts during the periods from approximately 7,000 to 6,500 years ago and from 5,500 to 4,000 years ago may have been limited because of the arid conditions. It is also suggested that the Pinto Period populations withdrew to the desert margins and oases during these arid periods, leaving large portions of the California deserts unoccupied for many centuries. Several sites are known from the Pinto Period in southern California, including sites in Death Valley, Salt Springs, the Stahl Site in Owens Valley, and sites in Pinto Basin near Joshua Tree National Monument. Pinto Period sites are associated with the margins of pluvial lakes and with now extinct springs. Pinto-series projectile points, crudely made stemmed or basally notched dart points, are the most distinctive artifact type of the Pinto Period. Other artifacts found at Pinto sites include large leaf-shaped knives; thick, split cobble choppers and scrapers; scraper-planes; and small milling slabs and manos. Most known Pinto Period sites are small surface deposits of lithic artifacts, suggestive of temporary and perhaps seasonal occupation by small groups of people (Warren 1984).

***Gypsum Period (ca. 4,000–1,500 B.P. [ca. 2000 B.C. to A.D. 500])***

The Gypsum Period is one of cultural intensification in the deserts of southern California. The beginning of this period coincides with the beginning of the Little Pluvial (ca. 2000 B.C.), a period of increased effective moisture in the region, which apparently allowed for more intensive occupation of the California deserts. During the succeeding arid periods, it appears that human populations gradually adapted in a variety of technological and socioeconomic ways to the

more arid desert environment. A few Gypsum Period sites from the deserts of California, Nevada, and Arizona have been excavated, including Gypsum Cave, Newberry Cave, Willow Beach, Rose Spring, Indian Hill Rockshelter, and Ray, Baird, and Chapman caves.

Diagnostic projectile points of this period include Humbolt, Gypsum, and Elko-series dart points (Warren 1984). Late in the Gypsum Period, Rose Spring arrow points appear in the archaeological record, reflecting the spread of the bow and arrow technology. Another technological innovation introduced during this period was the mortar and pestle for processing hard seeds. Other artifact types characteristic of this period include leaf-shaped arrow points, rectangular-based knives, flake scrapers, T-shaped drills, milling slabs and manos, as well as core/cobble tools assemblages such as scraper planes, large choppers, and hammerstones shaft smoothers, incised slate and sandstone tablets and pendants, and bone awls (Warren 1984). A wide range of perishable items dating to this period were recovered from Newberry Cave, including atlatl hooks, dartshafts and foreshafts, sandals and S-twist cordage, tortoise-shell bowls, and split-twig animal figurines.

The presence of both *Haliotis* and *Olivella* shell beads and ornaments and split-twig animal figurines indicates that the California desert occupants were in contact with populations from the Pacific coast and the southern Great Basin of Arizona, Utah, and Nevada.

### **Saratoga Springs Period (ca. A.D. 500–1200)**

This period reflects a continuation of the developments begun during the Gypsum Period, including an increasing adaptation to the desert environment and an increase in trade relations (Warren 1984). Variations in regional cultural adaptations during the Saratoga Springs Period also become apparent. Warren (1984) defines four cultural spheres within the Mojave and Colorado deserts during this period: a northern sphere located north of the Mojave River, a central desert sphere located around the Mojave River, the Antelope Valley sphere, and a southern desert sphere influenced by Patayan (Hatakayan) cultures adjacent to the Colorado River.

In the northern Mojave, the Saratoga Springs Period is marked by the dominance of Rose Spring and Eastgate arrow points over earlier Elko and Humboldt series dart points. Excepting this technological change, there appears to be a strong continuity of the Gypsum Period cultural assemblages in the northwestern Mojave.

In the central Mojave Desert, Anasazi interest in turquoise likely influenced populations living in the Mojave Desert as far west as the Halloran Springs area where hundreds of small turquoise mines existed. Toward the end of the Saratoga Springs Period, the Hakataya people apparently moved far enough north to gain control of the turquoise mines in the central Mojave Desert, thus replacing the Anasazi occupation of the eastern California desert.

In the Antelope Valley and western Mojave Desert, the Saratoga Springs Period is identified by Rose Spring and Cottonwood Triangular projectile points at large

village sites containing deep middens and cemeteries that have been dated from 250 B.C. to A.D. 1650 (Sutton 1981). These sites also contain large quantities of shell beads and steatite items that originated from southern California coastal regions. It appears that the occupants of Antelope Valley traded heavily with the coastal populations, developed large villages in the Saratoga Springs Period, and represent another divergent regional development during this period.

In the southern desert region, the impetus for change appears to have derived from Hakataya influences from the lower Colorado River, evidenced by the introduction of Buff and Brown Ware pottery and Cottonwood and Desert Side-notched projectile points. The initial date for the first Hakataya influence on the southern Mojave Desert remains unknown; however, it does appear that by A.D. 800–900 the Mojave Sink was heavily influenced, if not occupied by, lower Colorado River peoples (Moratto 1984).

### **Shoshonean Period (ca. A.D. 1200 to 1800)**

The regional formation of distinct ethnographic groups becomes clearer during the Shoshonean Period. In the southern deserts, Brown and Buff Ware pottery, first appearing on the lower Colorado River at about A.D. 800, started to diffuse across the California deserts by about A.D. 900 (Moratto 1984). Associated with the diffusion of this pottery were Desert Side-notched and Cottonwood Triangular projectile points dating to about A.D. 1150–1200, suggesting a continued spread of Hakataya influences. Trade along the Mojave River also expanded resulting in middlemen between coastal and Colorado River populations. Large, complex housepit village sites were established along the headwaters of the Mojave River (Smith 1963) and were somewhat similar to those reported in Antelope Valley (Sutton 1981). Although both of these areas appear to have participated in extensive trade between the desert and the coast, the lack of Buff and Brown Ware pottery at Antelope Valley sites suggests that these people were minimally influenced by the Hakataya developments along the Mojave River (Moratto 1984).

In the Shoshonean Period, the cultural expressions of the northwestern and eastern Mojave of the Saratoga Springs Period appear to have coalesced, forming a single cultural unit, which roughly corresponds to the boundary of the Numic speaking peoples. Hakataya influence in this region is marked by Desert Side-notched and Cottonwood Triangular projectile points and Brown Ware (Moratto 1984). This influence appears to have diminished during the late Shoshonean Period when the extensive trade networks along the Mojave River and in Antelope Valley appear to have broken down and the large village sites were abandoned. Subsequently, Spanish exploration and establishment of the Mission system during the late 1700s mark the end of prehistoric lifeways.

## **Ethnographic Background**

The Antelope Valley and adjacent Tehachapi Mountains lie within the traditional cultural territory of the Kitanemuk Native American group, with the western Antelope Valley shared with the Tataviam, Vanyume, and Serrano peoples as well. All of these cultural groups were based in areas outside of the western



Antelope Valley in the surrounding mountains or along the Mojave River. The Kitanemuk built their villages and were based primarily in the Tehachapi Mountains, but members of this tribe ranged into the western Antelope Valley during the cooler season of the year. Ethnographic sites, as is true with archaeological sites, were tethered to water resources, with streams and springs located in or at the base of mountain and hillslopes supporting villages and other significant use areas. Lithic resources procurement areas were also heavily exploited by the Kitanemuk. Areas such as the Antelope Valley floor were only sporadically utilized, usually for hunting or gathering; these activities are unlikely to leave much archaeological evidence.

The Kitanemuk spoke a Serran language of the Takic family. Many kinship terms are similar to those in other southern California languages, and suggest that the Kitanemuk were organized in a patrilineal structure. Unlike other groups, however, they were not organized into totemic lineages or moieties (Blackburn and Bean 1978). The Kitanemuk were enemies of the Tatavium to the east and the Yokuts in the Central Valley, but maintained complex trade and ritual alliances with the Chumash to the west and the Tubatulabal tribe to the north. These complex interactions gave them access to the resources of distant peoples, as well as influencing Kitanemuk mythology and ritual activities (Blackburn and Bean 1978).

The Kitanemuk were for the most part hunting, collecting, and harvesting peoples. Family groups worked in the mountains, foothills, and valleys, providing resources from different ecological niches. Kitanemuk houses were built of wattle and daub to withstand harsh winter weather in the mountains. Temporary shelters of brush were probably built in the desert areas to provide protection from the sun. To gather and prepare food resources, an array of equipment was used. Bows and arrows were the most important hunting tools, but traps, nets, disguises, blinds, throwing sticks, and slings were also part of the hunting technology. Gathering required few tools: poles for shaking down pine nuts and acorns, cactus pickers, chia hooks, seed beaters, digging sticks and weights for digging sticks, and pry bars. Materials associated with transportation mainly were used to move food and included burden baskets, carrying nets, and game bags. Some food was stored in large baskets.

Pottery ollas and baskets treated with asphaltum were used to store and carry water and seeds. Wood, clay, and steatite were used to make jars, bowls, and trays. Skin and woven grass were used to make bags. Food processing required hammers and anvils for cracking nuts; mortars and pestles for grinding acorns; manos and metates for grinding seeds and berries; winnowing shells and baskets; strainers; leaching baskets and bowls; knives of stone, bone, and wood, and bone saws; and drying racks made of wooden poles to dry fish. Basket mortars, with asphaltum used to attach an open-bottomed basket to a mortar, were important for food processing. Food was served in wooden gourd dishes and cups and in basket bowls that were sometimes tarred.

## Historic Background

### Early Exploration

As early as 1769, the Spanish explored the foothills surrounding the Antelope Valley in the western Mojave Desert. By 1806, two routes led from the desert to the coast: the Old Spanish Trail near Cajon Pass and Owens Valley Road through Tehachapi Pass (Beck and Haase 1974, Guerrero and Kompordides 1995).

One of the first Anglo-Americans to pass through the area was mountain man Jedediah Smith. Upon arriving at Mission San Gabriel in 1826, local Mexican officials, suspicious of his intentions, refused permission for him to continue travels in California (Magruder 1950). Despite the governor's command, Smith instead went north through the Tejon Pass and up the San Joaquin Valley to the Stanislaus River. Kit Carson, one of the trappers in Jedediah Smith's 1828 expedition, was the guide for John C. Fremont's party in 1844. Under Carson's guidance, the party crossed over the Old Spanish Trail, reached the Antelope Valley floor, and subsequently provided the first published descriptions of the regional flora, geography, and geology (Thompson 1929; Goetzmann 1978, 1979 as cited in Guerrero and Kompordides 1995).

### American Period

From the 1840s through the 1940s, federal and state lands in the Far West were available for private entry by the general public. Private land entry for agricultural settlement occurred by cash purchase, preemption, military service, homesteading, and railroad construction. A national policy for inhabiting unsettled or sparsely populated territories encouraged development of rural agricultural, growth of resource procurement industries, relocation of urban inhabitants to outlying rural areas, and expansion of the national economy (Ross 1998).

Settlement of the western Mojave Desert was motivated by most of the same factors experienced in other western states. However, as a region with its own specific environmental and geographical circumstances, four factors specifically stimulated growth in the region: railroad construction, enactment of Homestead and Desert Land laws, improved irrigation technology, and the development and experimentation of scientific dry-farming techniques (Guerrero and Kompordides 1995).

In 1850, the federal government funded surveys to explore alternate routes for the transcontinental railroad, including two surveys through the central Antelope Valley (Goetzmann 1979 cited in Guerrero and Kompordides 1995). In 1853, Lieutenant R.S. Williamson led an expedition to explore the passes in the southern Sierra Mountains and across the Mojave along the Old Spanish Trail to connect with surveys of the 32nd and 35th parallel routes. In 1854, Lieutenant Amiel W. Whipple's party surveyed the 35th parallel route from the Mississippi River to the coast. The results of these surveys indicated that the 35th parallel route was the best topographically for railroad construction (Guerrero and Kompordides 1995). Prior to the arrival of railroads, stagecoach routes brought travelers north from Los Angeles via Tejon Pass to the west of the Project area,

or traversed Antelope Valley. One such route known as the Joe Walker Trail or Los Angeles to Havilah route stopped at Willow Springs, about 20 miles east of the Project area, before proceeding north to the mines in the Kern River area. This stage route passed east of the Project area.

Willow Springs was once a stage stop until purchased by Ezra Hamilton. His intentions were to have sufficient water to run the mill for his Tropic gold mine, but the tranquil location proved to be a good site for a resort. In 1904, Hamilton spent \$40,000 to build what was eventually 27 stone buildings, including houses, a hotel, and a school and even a swimming pool. The resort continued operation until the post office closed in 1918. Today some of the buildings are still occupied. Two land grant railroads, the Atlantic and Pacific, as well as the Southern Pacific and one locally independent line, the California Southern, were catalysts for growth in the Antelope Valley. These railroads established routes from Los Angeles to San Francisco, Mojave to Needles, and San Diego to Barstow. The Southern Pacific Railroad finished its line from San Francisco to Los Angeles via the Antelope Valley in 1876. In 1884, the Southern Pacific line joined the Atchison, Topeka & Santa Fe and completed the line to Needles. Construction of the railroads with accompanying towns and watering stations, and the enactment of various laws between 1862 and 1878 for claiming land in the public domain, including the Homestead Act of 1862 and the Desert Land Act of 1877, encouraged population growth in the region (Guerrero and Komporlides 1995; Ross 1998). Rosamond was originally established as the community of Sand Creek. It was renamed after the daughter of an official of the Southern Pacific Railroad, when a depot was established in the late 1870s. Farming and cattle were prime industries in the early days. Rosamond is the nearest location to the Project area that is located on a rail line.

### **Colonization and Homesteading**

In the 1880s, colonization companies and local boosters spurred a variety of groups to establish colonies in the region including Quakers, German Lutherans, Scots, English, proponents of Prohibition and Scientific Farming, and Utopian Socialists. During the initial colonization years through 1920, the region faced fluctuating water levels and severe drought years (Guerrero and Komporlides 1995). Despite droughts that caused the failure of numerous colonies, development in the central Antelope Valley became relatively active between 1910 and 1929 (Hensher 1991, Hine 1953 as cited in Guerrero and Komporlides 1995).

By 1930, more than 80 towns had been built in the Antelope Valley; many of them were located along the railroads. In the vicinity of the Project, the small community of Fairmount was developed around 1910, in Los Angeles County near Fairmont Reservoir. The reservoir is part of the Los Angeles Aqueduct, which was built across the Antelope Valley in 1908-1913. Nearby Willow Springs was developed as a resort in 1904, by the owner of the adjacent Tropic Mine.

In the 1930s, severe drought, compounded by events in the Dust Bowl and an unprecedented worldwide depression, began to severely impede homesteading

efforts. The homesteading era ended in 1935 when the remaining public domain was withdrawn from entry (Guerrero and Kompordides 1995).

The main focus of the homesteaders' economy in the Antelope Valley was agriculture and ranching. Dry-farming methods were utilized with some success in the late 1880s and early 1890s when rainfall was unusually plentiful. However, a severe drought between 1893 and 1904 brought the demise of many agricultural pursuits in the Antelope Valley (Guerrero and Kompordides 1995).

Cattle and sheep ranching were profitable due largely to the availability of open range and water. Although cattle grazing in the central Antelope Valley began in the late 1860s, widespread cattle ranching did not begin until 1888, when the Starkey and Butterworth families settled in the Rosamond area. The Butterworth ranch, near Buckhorn Springs, became the largest cattle operation in Antelope Valley. Eventually, the Rosamond area developed into an industrial center for cattle ranching (Guerrero and Kompordides 1995).

Sheep also played an important role in the area's economy. They were more amenable to the arid environment and could spend the winter grazing on desert plants lush enough to preclude the need for a separate, consistent water source. When desert foliage dried, the sheep were driven north along the western edge of the Mojave through Walker Pass and into the basin ranges to graze for the spring and summer (Beck and Haase 1974, Guerrero and Kompordides 1995).

### **Mining**

Mining was an important addition to the economy of the homesteader because it offered the potential of a high return for minimal investment. The development of mining in the central Antelope Valley was the result of mining technology adapted to the desert environment and the availability of rail transportation (Guerrero and Kompordides 1995). Three types of mining were dominant in the Antelope Valley: precious metals mining (gold and silver), common mineral extraction (clay, mud, and borate), and leaseable resources (oil). A mining boom occurred with the discovery of gold by Ezra Hamilton at Tropic Hill just east of Willow Springs in 1894. After Hamilton's initial discovery, others followed in an attempt to establish their fortunes. Thousands of miners filed mining claims in Kramer Hills after gold was discovered there in 1926. Kramer Hills became one of several mining districts developed in the Antelope Valley (Guerrero and Kompordides 1995).

## **Paleontological Setting**

The Antelope Valley is a broad trough underlain by sedimentary deposits derived by water and wind erosion from the surrounding Tehachapi and San Gabriel mountains. Deposits within the Project area are primarily younger Holocene alluvial fan deposits, which are less than 10,000 years in age. These sediments are in turn underlain by older Quaternary sediments, Pleistocene in age (10,000 to 1.2 million years old), which are known to contain fossils. These older Quaternary sediments typically occur at depths of 5 to 10 feet. This encompasses the areas designated for the recharge and recovery facilities. However, Older

Quaternary alluvium occurs at the surface on the south slopes of the Antelope Valley south of Avenue D, including the alignment of the Phase 2 delivery pipeline.

## Regulatory Framework

### Federal Regulations

For federal projects, cultural resource significance is evaluated in terms of eligibility for listing in the National Register of Historic Places (NRHP). NRHP criteria for eligibility are defined below.

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling and association, and that

- are associated with events that have made a contribution to the broad pattern of our history;
- are associated with the lives of people significant in our past;
- embody the distinct characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- have yielded, or are likely to yield, information important in prehistory or history (36 CFR 60.4).

### State Regulations

#### California Environmental Quality Act

According to CEQA (Public Resources Code, Section 21084.1), historical resources include any resource listed, or determined to be eligible for listing, in the California Register of Historical Resources (California Register). Properties listed in or determined eligible for listing in the National Register, such as those identified in the Section 106 process, are automatically listed in the California Register. Therefore, all “historic properties” under federal preservation law are automatically “historical resources” under state preservation law. Historical resources are also presumed to be significant if they are included in a local register of historical resources or identified as significant in a qualified historical resource survey.

As defined under state law in Title 14 CCR §4850, the term “historical resource” means “any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or which is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural history of California.” For the purposes of CEQA,

“historical resource” is further defined under Public Resources Code §15064.5 as a “resource listed in, or determined eligible for listing in the California Register.”

Section 15064.5 of the State CEQA Guidelines sets forth the criteria and procedures for determining significant historical resources and the potential effects of a project on such resources. California criteria closely mirror those of the Federal NRHP.

Generally, a cultural resource shall be considered by the lead agency to be “historically significant” if the resource meets any of the criteria for listing on the California Register, including the following:

- the resource is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage;
- the resource is associated with the lives of persons important in our past;
- the resource embodies the distinctive characteristics of a type, period, region, or method of construction or represents the work of an important creative individual or possesses high artistic values; or
- the resource has yielded, or may be likely to yield, information important in prehistory or history.

The cited statutes and guidelines specify how cultural resources are to be managed in the context of projects such as the proposed Project. Briefly, archival and field surveys must be conducted, and identified cultural resources must be inventoried and evaluated in prescribed ways. Prehistoric and historical resources deemed “historically significant” must be considered in project planning and development.

*Significant paleontologic resources* are defined as fossils or assemblages of fossils that are unique, unusual, rare, uncommon, or important to define a particular time frame or geologic strata or that add to an existing body of knowledge in specific areas, in local formations, or regionally. Paleontologic remains are accepted as nonrenewable resources significant to our culture and, as such, are protected under provisions of the Antiquities Act of 1906 and subsequent related legislation, policies, and enacting responsibilities.

In the State of California, fossil remains are considered to be limited, nonrenewable, and sensitive scientific resources. These resources are afforded protection under the following State of California legislation:

- CEQA of 1970;
- 13 Public Resources Code, 21000 et seq., which requires public agencies and private interests to identify potential adverse impacts and/or environmental consequences of their proposed project(s) to any object or site important to the scientific annals of California (Division 1, Public Resources Code: 5020.1 [b]); and
- Guidelines for the Implementation of CEQA (as amended January 1, 1999).

State CEQA Guidelines Section 15064.5(a)(3) provides protection for paleontologic resources by requiring that they be identified and mitigated as historical resources under CEQA. The State CEQA Guidelines define historical resources broadly to include any object, site, area, or place that a lead agency determines to be historically significant.

### **California Health and Safety Code**

Human remains are also sometimes associated with archaeological sites. According to CEQA, “archaeological sites known to contain human remains shall be treated in accordance with the provisions of State Health and Safety Code Section 7050.5.” The protection of human remains is also ensured by California Public Resources Codes, Section 5097.94, 5097.98, and 5097.99.

If human remains are exposed during construction, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the county coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code 5097.98. Construction must halt in the area of the discovery of human remains, the project proponent must assure that the area is protected, and consultation and treatment shall occur as prescribed by law.

## **Local Regulations**

### **Kern County General Plan**

The Kern County General Plan, adopted on June 15, 2004, states that Kern County shall address archaeological and historical resources in accordance with CEQA. Relevant policy and implementation measures are provided below.

### ***Land Use/Conservation/Open Space Element***

#### ***Archaeological, Paleontological, Cultural, and Historical Preservation***

##### **■ Policy**

- The County will promote the preservation of cultural and historic resources which provide ties with the past and constitute a heritage value to residents and visitors.

##### **■ Implementation Measures**

- Coordinate with the California State University, Bakersfield’s Archaeology Inventory Center.
- The County shall address archaeological and historical resources for discretionary projects in accordance with the California Environmental Quality Act (CEQA).
- In areas of known paleontological resources, the County should address the preservation of these resources where feasible.
- The County shall develop a list of Native American organizations and individuals who desire to be notified of proposed discretionary projects. This notification will be accomplished through the established procedures for discretionary projects and CEQA documents.

- On a project specific basis, the County Planning Department shall evaluate the necessity for the involvement of a qualified Native American monitor for grading or other construction activities on discretionary projects that are subject to a CEQA document.

### **Willow Springs Specific Plan**

Relevant policy and implementation measures from the Willow Springs Specific Plan are provided below.

#### **Cultural Resources**

##### **■ Policy**

- Archaeological investigations shall be required of specific properties proposed for development. These sites are identified in the Environmental Impact Report under Cultural Resources – Literature and Records Search, page 77, and are listed as: CA-KER-2819, 2820 2821; CA-KER-522,1969,2592,2593,2599,2595 and 2714; CA-KER-129, 273, 298, 302, 303. (Record on file Southern San Joaquin Valley Information Center in Bakersfield – California State University of Bakersfield.)
- Recorded archaeological sites shall be subjected to individual studies prior to development.

##### **■ Mitigation/Implementation Measures**

- Prior to issuance of grading permits, archaeological investigations shall be required of specific properties proposed for development. This approach will eventually produce a complete record of all cultural resources present within the study area and should constitute a major contribution to the reconstruction of the Kitanemuk settlement pattern.
- Prior to grading permit issuance, a recorded archaeological site found on a specific property proposed for development shall be subjected to individual study prepared at the expense of the developer by a qualified historian. Surface collection, text excavation, and laboratory analysis constitute procedures necessary to properly assess both the significance and the research potential of each individual resource.
- Larger “village” sites, such as CA-KER-129, cemeteries, and other sites of religious significance, may be found within the study area and shall require more intensive investigation and more complete preservation.

Recorded archaeological sites shall be subjected to individual studies prior to development.

### **Los Angeles County General Plan**

Relevant policies from the Los Angeles County General Plan are provided below.

#### **Cultural Resources**

Whenever there is a substantial indication that significant historical, archaeological, or paleontological resources may be located on the project site, a survey by qualified professionals shall be required and, where appropriate, a program for resource preservation or salvage shall be implemented. Whenever



possible, the affected portions of the site should be avoided for building purposes.

### ***Conservation, Open Space and Recreation Cultural Heritage Resources***

The County has numerous archaeological and historical sites from the Indian, Hispanic and American periods of California history. Paleontological sites and important geological formations from periods millions of years before man's first appearance exist in the County. The cultural heritage resources are nonrenewable and irreplaceable. Public awareness of their value should be encouraged, and their enjoyment should be fostered whenever possible.

#### ■ **Policy**

- Protect cultural heritage resources, including historical, archaeological, paleontological and geological sites, and significant architectural structures.

### **Antelope Valley Areawide General Plan**

The portions of the delivery pipeline route located in Los Angeles County are in an area covered by the Antelope Valley Areawide General Plan, a component of the Los Angeles County General Plan. The Antelope Valley Areawide General Plan, adopted in 1986, does not specifically discuss cultural or archaeological resources (County of Los Angeles Department of Regional Planning 1986).

The Antelope Valley Areawide General Plan does state that a goal of the county is to “[m]inimize disruption and degradation of the environment as land use develops” and to “[d]irect future growth away from areas exhibiting high environmental sensitivity to land use development unless appropriate mitigation measures can be implemented.” (County of Los Angeles Department of Regional Planning 1986.)

## **Impact Analysis**

This section describes the impact analysis relating to cultural resources for the Project. It describes the methods used to determine the Project’s impacts, lists the thresholds used to conclude whether an impact would be significant, and discusses the impacts of the Project based on these thresholds.

## **Methodology**

### **Cultural Resources**

#### **Record Searches Kern County**

A literature and records search of 77 square miles in Kern County was examined for this Project. This record search encompassed the 4-square-mile area of Kern

County designated for the recharge ponds, the 26-square-mile area that includes the area proposed for the recovery wells and recovery pipelines, and a buffer zone designed to capture a sample area of the Antelope Valley floor adjacent to the Project area.

Within the 4 square miles encompassing the proposed recharge ponds, no cultural sites or isolated artifacts have been recorded. One survey had been undertaken in the past in this area, a pipeline survey along Avenue A. Within the 26-square-mile area that would include the proposed recovery wells and recovery pipelines, 16 previous surveys totaling 4,340 acres have located two prehistoric sites, both lithic scatters, and six isolated artifacts, four flakes, and two mano fragments. Within the broader records search area, the majority of recorded sites were located near Willow Spring and Bean Spring, northeast of the Project area, or at the base of the Tehachapi Mountains, northwest of the Project area.

Mid-twentieth century maps were examined for information regarding potential historic-era sites within the recharge ponds portion of the Project; however, no evidence of earlier structures or other historic uses were depicted. The more recent 1965 Fairmont Butte quadrangle map depicts two structures in the recharge ponds area. One of these structures, a now abandoned house, was built in the late 1950s or early 1960s, and is not a historical resource. A second structure depicted on the 1965 quadrangle map has been demolished, and no evidence of it exists on the ground.

### ***Los Angeles County***

A literature and records search of 25 square miles in Los Angeles County was examined for this Project. This record search encompassed 18 square miles, a zone a mile on either side of the proposed Phase 2 delivery pipeline, and a buffer zone on the Antelope Valley floor adjacent to the proposed well field and recharge basins.

Within the 18 square miles extending south to the California Aqueduct, 15 cultural sites have been recorded. Seven prehistoric sites are situated a little less than a mile east of 170th Avenue, surrounding Fairmont Butte. This butte is a large prehistoric quarry and camp area, recorded as CA-KER-1789, where prehistoric populations were supported by small springs and intermittent streams. The remaining eight sites are from the historic period; one of these, the former town site of Fairmont (CA-RIV-673H) is located just east of the proposed Phase 2 delivery pipeline. No structures associated with Fairmont are currently standing, and no historic era structures of any kind occur on the proposed pipeline route within Los Angeles County.

On the portion of the Antelope Valley floor in Los Angeles County adjacent to the proposed Project, four isolated artifacts have been recorded. This pattern supports the pattern seen in Kern County: prehistoric sites occur near water or lithic material sources, and not on the un-watered valley floor.

### ***Native American Consultation***

Native American consultation for this Project was conducted by the County of Kern. The Kern County Planning Department submitted a request for a Tribal

Consultation List to the Native American Heritage Commission (NAHC) in 2005, and received a reply on May 3. The NAHC provided a list of three Native American groups to be consulted, the Santa Rosa Rancheria, the Tule River Indian Tribe, and the Tejon Indian Tribe. Letters were sent to these three organizations by the Planning Department, requesting comments or consultation per Government Code Section 65352.2. Responses were received from the Santa Rosa Rancheria and the Tejon Indian Tribe.

Jones & Stokes contacted the NAHC on August 23, 2005, requesting a review of the Sacred Lands File. The NAHC replied on September 7, 2005, indicating that no Native American cultural resources were recorded in the Sacred Lands File within the Project area.

## **Field Survey**

### ***Modeling***

To focus cultural resources efforts prior to pedestrian survey, the Project area was assessed for its probability to contain prehistoric cultural resources. Results of the records and literature search were compared to the Project area in terms of natural setting and known site locations. Results of the records search and other survey work in the area indicate that the valley floor setting of the Project area has a very low potential to encompass prehistoric archaeological sites. Given the large extent of the Project area and a desire to limit environmental assessment efforts to those likely to be productive, the choice was made to conduct a sample survey of this portion of the Project area.

Sediments in the valley floor portion of the Project area are of Holocene age, that is, less than 10,000 years, and could contain cultural deposits. However, the valley floor appears to have originally been covered with a thin Aeolian sand sheet, 1 to 3 feet thick. This area has been plowed and deep plowed, as well as leveled by machine, to accommodate agriculture. Holocene age sediments on the valley floor portion of the Project area are estimated to be 5 feet in thickness. Previous work in southern California has shown that deep plowing and machine leveling can disturb this thickness of sediments and bring prehistoric artifacts to the ground surface (Robinson 2001). This makes it unlikely that significant prehistoric cultural resources with no surface expression are buried within the thin valley floor sediments.

In contrast, the south slopes of the Antelope Valley are made up of thicker wedges of alluvial fan sediment on the lower slopes between Avenue A and Avenue D and of Older Quaternary alluvium south of Avenue D. Archaeological monitoring work in southern California in similar settings has recovered deeply buried early Holocene sites (McDougall et al. 2003). This setting indicates that this portion of the Project (the location of part of the Phase 2 delivery pipeline) has a moderate potential to contain buried cultural resources. In addition, this area is crossed by several small intermittent streams and is located less than 1 mile east of the extensive lithic quarry site, CA-KER-1789. All of these factors indicate that this portion of the Project area has a moderate sensitivity for buried cultural resources. South of Avenue D, the older Quaternary alluvium is exposed at the surface, with a low potential for buried cultural resources.

### Field Methods

The cultural resources survey was conducted for the recharge basins portion of the Project, and the pipeline right-of-way location extending south into Los Angeles County to the California Aqueduct. The survey was conducted on June 9, 23, 27, 28, and 29, 2005; August 26, 2005; and September 27, 2005.

Within the areas proposed for the proposed recharge basins, a sample survey was conducted. The recharge basin area was divided into 41 parcels, each parcel consisting of approximately 40 acres using the standard section lines, and each parcel assigned a number. Eleven of these parcels, a 26.83-percent sample, were then selected at random for pedestrian survey using a random number generator. Each 40-acre parcel was surveyed on foot along transects spaced 15 meters apart.

The proposed alignment of the new delivery pipeline was surveyed for a distance of 5.5 miles to the hillslopes south of the recharge basin area. This survey ended at Avenue F8, due to property access. Two transects were walked for this survey on the east side of 170th Street, one at the edge of the shoulder and one within agricultural fields 15 meters farther east.

The numbers and proposed locations of recovery wells and recovery pipelines have not been finalized. Therefore, no cultural resources survey was done in these areas, and further surveys will be required when construction locations are determined, as discussed in the mitigation measures below.

### Results and Findings

No cultural resources were found during the pedestrian surveys conducted for the Project. Figure 4.4-1 identifies the areas not surveyed. The sample survey of the recharge basin area and the survey of portions of the Phase 2 delivery pipeline alignment located no prehistoric or historic-era cultural resources. This result was expected given the desert conditions of this portion of the Project area and the lack of surface water. As noted above, known cultural sites are located near water sources, and lithic materials procurement areas.

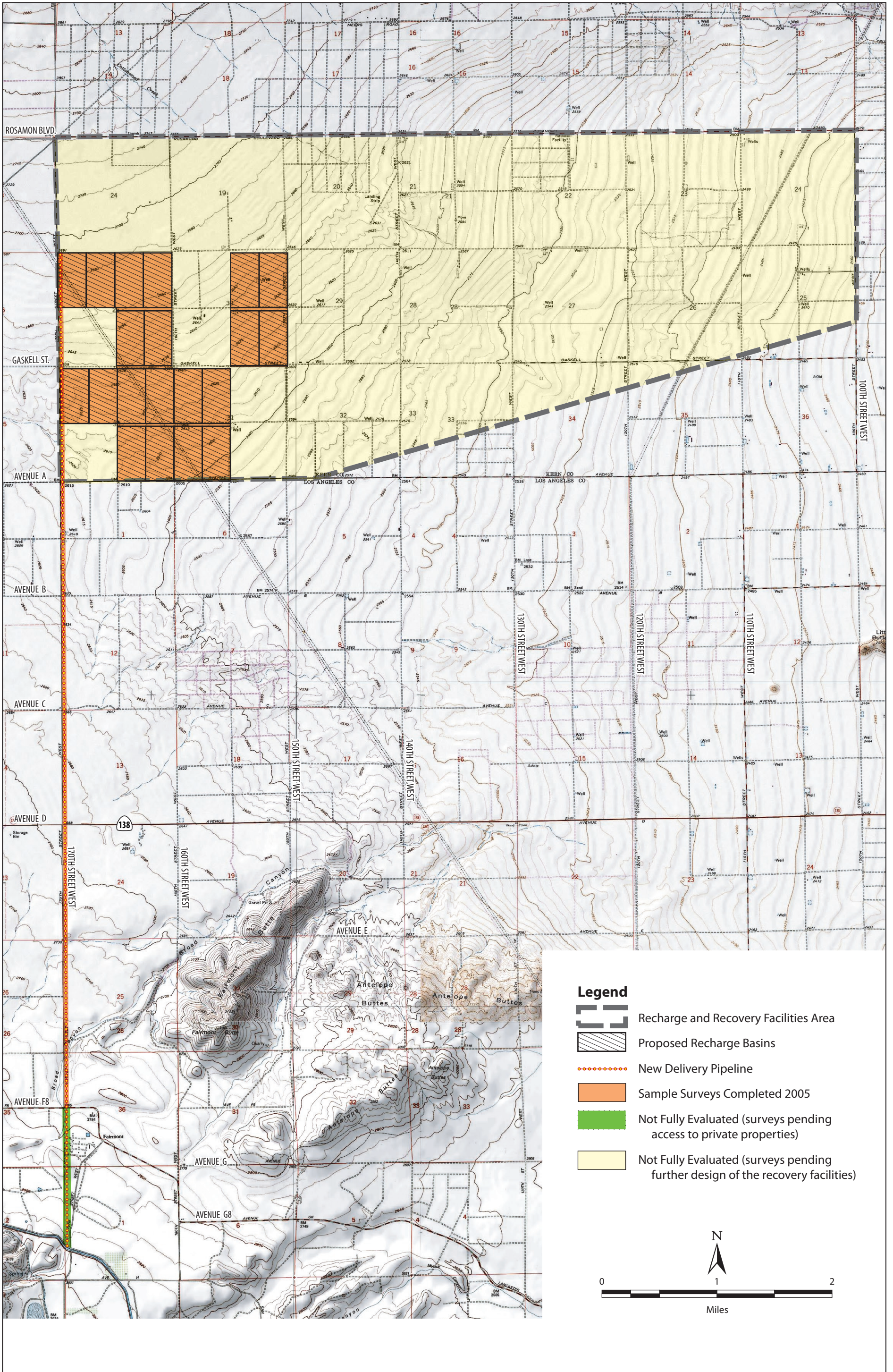
## Paleontology

### Record Search

The Vertebrate Paleontology section of the Natural History Museum of Los Angeles County conducted a search of its records for the proposed Project vicinity. No known vertebrate fossil localities lie directly within the proposed Project site, but the museum did identify nearby localities from the same or similar sedimentary deposits as those that occur as subsurface strata in the proposed Project area.

The closest known vertebrate fossil localities, LACM 5942 through 5953, found within similar Quaternary deposits, are located near Palmdale along Avenue S. This location produced fossil specimens of small vertebrates, including kingsnake, *Lampropeltis*; gopher snake, *Pituophis*; kangaroo rat, *Dipodomys*; leopard lizard, *Gambelia wislizenii*; rabbit, *Sylvilagus*; pocket mouse, *Chaetodipus*, and pocket gopher, *Thomomys*.





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**Figure 4.4-1**  
**Cultural Resources Survey Status for the Project Area**



**Field Survey**

No paleontological field survey was conducted for the Project.

**Findings and Results**

No paleontological resources are known to exist in the Project area. However, fossils have been recovered in similar settings in the Antelope Valley, at depths greater than 3 feet.

## Thresholds of Significance

The Kern County CEQA Implementation Document and Kern County Environmental Checklist state that a project would have a significant impact on cultural resources if it would:

- cause a substantial adverse change in the significance of an historical resource as defined in Section 15064.5;
- cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5;
- directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or
- disturb any human remains, including those interred outside of formal cemeteries.

## Cultural Resources Thresholds

A substantial change in the significance of a historical resource is explained in the following excerpt from the State CEQA Guidelines.

Substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired (§15064.5[b]1).

Cultural resources management work conducted as part of the proposed Project first determines whether an archaeological site is a “historically significant” cultural resource. Generally, a cultural resource shall be considered to be historically significant if the resource meets any of the criteria for listing on the California Register, which is discussed under Regulatory Framework.

The cited statutes and guidelines specify how cultural resources are to be managed in the context of the project. These regulations require that archival and field surveys be conducted and identified cultural resources be inventoried and evaluated in prescribed ways. Prehistoric and historical resources deemed “historically significant” must be considered in project planning and development.

Therefore, if potentially significant archaeological resources are discovered during implementation of the proposed Project, those resources must be inventoried and evaluated to ascertain whether they meet the criteria for listing on the California Register.

## Paleontologic Resources Thresholds

Paleontologically sensitive sedimentary units are those units with a high potential for containing significant paleontologic resources (i.e., rock units within which vertebrate fossils or significant invertebrate fossils have been determined by previous studies to be present or likely to be present). These units include, but are not limited to, sedimentary formations that contain significant paleontologic resources anywhere within their geographical extent as well as sedimentary rock units temporally or lithologically suitable for the preservation of fossils. Determinations of paleontologic sensitivity must therefore consider not only the potential to yield abundant vertebrate fossils but also the potential for production of a few significant fossils, large or small, vertebrate or invertebrate, which may provide new and significant data on fossils types, species changes over time, or geologic strata. Areas that may contain datable organic remains older than the Holocene (Recent) era (less than 10,000 years in age) and areas that may contain unique, new vertebrate deposits, traces, and/or trackways must also be considered paleontologically sensitive.

Fossils can be considered to be of significant scientific interest if one or more of the following criteria apply:

- the fossils provide data on the evolutionary relationships and developmental trends among organisms, both living and extinct;
- the fossils provide data useful in determining the age(s) of the rock unit or sedimentary stratum, including data important in determining the depositional history of the region and the timing of geologic events therein;
- the fossils provide data regarding the development of biological communities or interaction between paleobotanical and paleozoological biotas;
- the fossils demonstrate unusual or spectacular circumstances in the history of life; or
- the fossils are in short supply and/or in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation and are not found in other geographic locations.

The Kern County CEQA Implementation Document and Kern County Environmental Checklist state that a project that may cause a substantial adverse change in the significance of a paleontological resource is a project that may have a significant effect on the environment (CEQA rev. 1998, Section 15064.5[b]). CEQA further states that a *substantial adverse change in the significance of a resource* means the physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance would be materially impaired. Therefore, for purposes of the

analyses in this EIR the proposed Project would have a significant effect on the environment if it directly or indirectly destroys a unique paleontological resource or site.

## Impacts and Mitigation Measures

### Impact 4.4-1: Potential to Damage or Destroy a Significant Historical Resource

No cultural resources are recorded in the Project area, and none was found during surveys of the recharge basin area in Kern County or the Phase 2 delivery pipeline alignment in Los Angeles County. Analysis of previous cultural surveys in the western end of the Antelope Valley suggests that the Project area on the valley floor has a low sensitivity for prehistoric and historical cultural resources. Based on these results, the impacts of the proposed Project on cultural resources are likely to be negligible within these low-sensitivity valley floor areas.

Analysis of soils and of known sites adjacent to the Project area suggest that those portions of the Phase 2 delivery pipeline that would cross the southern slopes of the Antelope Valley between Avenue A and Avenue D are in an area of moderate-to-high sensitivity for buried cultural resources. The presence of Holocene-age alluvial fan wedges, the nearby lithic source of CA-KER-1789, and stream crossing of the areas all suggest scenarios in which archaeological sites could be buried in place by alluvial fan deposits.

In addition, some portions of the Project area have not been surveyed yet because specific locations for the recovery facilities have not been proposed yet and the southern portion of the Phase 2 delivery pipeline alignment was not accessible. Excavation activities associated with construction could destroy, relocate, or alter a cultural resource or its immediate surroundings such that the significance of the resource would be materially impaired. This potential impact is significant.

The following mitigation measures shall be implemented to reduce Project-related adverse impacts to archaeological resources that may be encountered during construction of the proposed Project.

#### Mitigation Measures

**Mitigation Measure 4.4-1:** Prior to ground disturbance of the areas of the Project, identified on Figure 4.4-1 as not fully evaluated, a cultural resource survey and a written report shall be prepared. The report shall include findings and recommendations, if any, for further work to ensure protection of any discoveries. The report shall be submitted to the Kern County Planning Department, the Los Angeles County Planning Department, and the tribes identified by the Native American Heritage Commission for SB 18 consultation. All recommendations shall be incorporated into grading and construction plans.

**Level of Significance after Mitigation:** Less than significant.



***Mitigation Measure 4.4-2:*** A certified archaeologist shall monitor all Project-related initial ground-disturbing activities along the proposed Phase 2 delivery pipeline alignment between Avenue A and Avenue D. All discoveries shall be documented, and a report of findings prepared and submitted to the Los Angeles County Planning Department and the tribes identified by the Native American Heritage Commission for SB 18 consultation. Archaeological deposits shall be further evaluated for significance according to California Register criteria. Recovery of significant archaeological deposits shall occur using standard archaeological techniques, including but not limited to, manual or mechanical excavations, monitoring, soils testing, photography, mapping, or drawing to adequately recover the scientifically consequential information from and about the archaeological resource. An adequate sample of cultural materials shall be recovered. The applicant shall arrange for permanent curation of artifacts and documents in a repository consistent with the National Park Service guidelines for the curation of archaeological collections (36CFR79).

**Level of Significance after Mitigation:** Less than significant.

***Mitigation Measure 4.4-3:*** If buried cultural resources are uncovered during construction, all work shall be halted in the vicinity of the archaeological discovery until a qualified archaeologist can visit the site of discovery and assess the significance of the archaeological resource.

In the event of an accidental discovery of any human remains in a location other than a dedicated cemetery, the steps and procedures specified in Health and Safety Code 7050.5, State CEQA Guidelines 15064.5(e), and Public Resources Code 5097.98 shall be implemented.

**Level of Significance after Mitigation:** Less than significant.

#### **Impact 4.4-2: Potential to Damage or Destroy a Significant or Unique Paleontological Resource**

Within the majority of the Project area, surface sediments consist of younger Quaternary Alluvium. The uppermost few feet of this alluvium are unlikely to contain significant fossil remains and have been previously disturbed by plowing. However, at depth within the older Quaternary sediments, there is a high potential of encountering significant vertebrate fossils. In addition, older Quaternary sediments are found at the ground surface in the southern portion of the proposed connector pipeline.

The Natural History Museum of Los Angeles County has no records of fossil finds directly within the proposed Project site but has found fossil localities nearby in similar sediments. This has led the museum to conclude that fossil-bearing sediments are present in relatively shallow contexts in the area, including the recharge basins. The integrity of the land surface at the proposed Project site is likely to be good below shallow agricultural disturbance, and paleontological sensitivity is considered moderate.

Surface grading or very shallow excavations into the younger Quaternary alluvial deposits is unlikely to expose significant fossilized vertebrate remains. However, excavations of 5 feet or more in depth, extending into the older Quaternary deposits, could expose significant fossilized vertebrate remains. The destruction of any unique fossil resources would be a significant impact.

The following mitigation measure shall be implemented to reduce potential Project-related adverse impacts to archaeological resources that may be encountered during construction of proposed Project.

**Level of Significance before Mitigation:** Significant.

#### **Mitigation Measure**

***Mitigation Measure 4.4.4:*** A qualified paleontologic monitor shall monitor excavation in areas identified as likely to contain paleontologic resources. These areas are defined as all areas within the proposed Project area where planned excavation would exceed depths of 5 feet. The drilling of wells is excluded from this provision, because mechanical drilling does not allow for fossil recovery. This monitoring shall be required along the proposed alignment of the Phase 2 delivery pipeline as well as areas within the recharge and recovery basins that would involve ground disturbance to a depth below 5 feet. The qualified paleontologic monitor shall retain the option to reduce monitoring if, in his or her professional opinion, sediments being monitored are previously disturbed. Monitoring may also be reduced if the potentially fossiliferous units, previously described, are not found to be present or, if present, are determined by qualified paleontologic personnel to have low potential to contain fossil resources.

The monitor shall be equipped to salvage fossils and samples of sediments as they are unearthed to avoid construction delays and shall be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens. Because the older Quaternary deposits yield small fossils specimens likely to go unnoticed during typical large scale paleontological monitoring, matrix samples shall be collected and processed to determine the potential for small fossils to be recovered prior to substantial excavations in those sediments. If this sampling indicates these units do possess small fossils, a matrix sample of up to 6,000 pounds shall be collected at various locations, to be specified by the paleontologist, within the construction area. These matrix samples shall also be processed for small fossils.

Recovered specimens shall be prepared to a point of identification and permanent preservation, including washing of sediments, to recover small invertebrates and vertebrates. Specimens shall be curated into a professional, accredited museum repository with permanent retrievable storage.

A report of findings, with an appended itemized inventory of specimens, shall be prepared. The report and inventory, when submitted to the Kern County Planning Department and Los Angeles County Planning Department, will signify completion of the program to mitigate impacts to paleontologic resources.

**Level of Significance after Mitigation:** Less than significant.

## Cumulative Impact

Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The cumulative impact scenario for the Project includes seven specific projects identified by Kern and Los Angeles Counties, and buildout of the Kern County General Plan. A detailed description of the cumulative impact scenario considered with the proposed Project is provided in Chapter 3, “Project Description,” and the project list is presented below.

A cumulative impact analysis first identifies whether a cumulatively significant impact exists in the given resource area. If so, it determines whether the project will make a considerable contribution to that impact. Where a cumulative impact is severe, even a small contribution may be considerable (Section 15130(b) of the State CEQA Guidelines).

**Table 4.4-1-. Relevant Cumulative Projects**

Case Number (if applicable)	Project Name	Project Location	Approximate Distance to Project Site	Project Type	Project Description
<b>Kern County</b>					
GPA 1, Map 218	Tejon Mountain Village Specific Plan	East of I-5 in the hills north and east of Castaic Lake	14 miles northwest of project site	Major Residential/ commercial/ recreational development	3,450 single family units (s.f.u.) homes on 23,000- acre planning area,
GPA, Map 255	Lebec Canyon Estates	East of Frazier Mountain Park Road/I-5 interchange	22 miles west of project site	Residential development	32 s.f.u on 1,000 acres
SPA 8, Map 254, Amend. Zone Map 254, Zone Change 6, SP 1, Map 254, Vesting Tent. Tract 6436	Frazier Park Estates	Southern boundary of Kern Co. and portion of LA County, west of I-5 south of Frazier Mountain Park Road	24 miles west of project site	Residential / Commercial development	705 s.f.u. and 135 thousand sq. ft of commercial on 847 acres in Kern County and 323 in LA County
GPA to 5.7, Map 215	Christine Bower	One quarter mile west of 105 <sup>th</sup> Street and McConnell Road near Rosamond	3 miles north of project site	General Plan Amendment and Zone	4 s.f.u on 20- acre site
ZC to A-1, Map 231	Julien and Assoc.	8684 Sweetser Road, Rosamond (APN 315-081-09)	3-1/2 miles northeast of project site	Commercial greenhouses	60-acre site
<b>Los Angeles County</b>					
N/A	Centennial Specific Plan	1 mile east of I-5, adjacent to SR-138	16 miles southwest of project site	Large-scale new community; including residential/ commercial development	23,000 d.u. and 14 million sq. ft. commercial on 11,700 acres
N/A	Gorman Ranch	Gorman Post Road, north of SR-138, east of I-5	17 miles southeast of project site	Residential	227 s.f.u. on 2,500 acres

The geographic scope of the area affected by potential cumulative archaeological impacts is defined by the cultural setting and ethnographic territory of the prehistoric and historic peoples who have occupied this area of southern California. As discussed in Section 4.4, this region of Kern and Los Angeles counties was part of the territory of the Kitanemuk people.

## Kern County General Plan and Relevant Projects

Buildout of the cumulative scenario (General Plan and cumulative projects) would increase the potential for significant cumulative impacts on cultural resources, especially in areas with water features or rich ecological pockets, where the potential for previous human occupancy is increased.

Planning and design policies of Kern County and Los Angeles County are expected to ensure that new developments avoid or minimize impacts on cultural resources (see Section 4.4, Cultural Resources). Nonetheless, related projects in the Project area could result in the progressive loss of as-yet-unrecorded archaeological resources. This loss, without proper mitigation, would be considered a significant cumulative impact notwithstanding the proposed Project.

The proposed Project itself could also disturb or destroy archaeological resources that may exist in the area, a potentially significant impact. However, the Project also includes surveying and monitoring requirements to avoid these potential impacts. Consequently, the incremental effects of the proposed Project, after mitigation, would not contribute considerably to a cumulative significant impact on archaeological resources under CEQA.

Only two projects in the cumulative scenario (**Bower and Julien**) are located in the area that was previously inhabited territory of the Kitanemuk people. While these two projects, when combined with the proposed Project, could result in a cumulative impact on undiscovered archaeological resources associated with the Kitanemuk people, no resources have been located on the Project site during the archaeological survey. Impact 4.4-1 acknowledges the potential of Project activities to damage or destroy significant cultural resources; however, mitigation measures identified below would lessen this potential to a less-than-significant level. All other projects in the cumulative scenario are located in the historical territories of different Native American peoples (e.g., Chumash) and therefore would not contribute to a cumulative effect with the proposed Project.

Cultural Resource Impact 4.4-2 identifies the potential of the Project to damage or destroy significant paleontological resources. Mitigation Measure 4.4.4 (discussed below) minimizes this potential impact to a less-than-significant level. Similar mitigation will be required for other projects in the cumulative scenario pursuant to Kern County General Plan policies, minimizing any potentially significant cumulative impacts.

**Mitigation Measures:**

Implementation of Mitigation Measures 4.4-1 (survey remaining portions of site), 4.4-2 (monitor construction along the proposed Phase 2 delivery pipeline), 4.4-3 (stop construction if resource is found), and 4.4-5 (monitor construction when ground disturbance exceeds 5 feet) will reduce the potential impacts on cultural and paleontological resources at the project site to a less-than-significant level. The project, with mitigation, will not have a cumulative impact on cultural resources.

**Level of Significance after Mitigation:** Cumulative impacts would be less than significant.

## 4.5 Geology and Soils

### Introduction

This section describes geologic, seismic, and soil conditions, hazards, and constraints in the Project vicinity, as well as the regulations that apply to such issues. This section concludes with a discussion of the potential impacts of the Project with respect to these resources/hazards, as well as measures to mitigate significant impacts.

### Environmental Setting

#### Existing Conditions

##### Geology

The Project is located in the western Antelope Valley in eastern Kern County and northern Los Angeles County. The west end of the Antelope Valley basin is bounded by the Tehachapi Mountains on the north and the San Gabriel Mountains on the south; these two ranges converge to form a triangular-shaped western end of the valley at the Sierra Pelona Range. The Antelope Valley is a *graben*—a block of the earth's crust that has dropped down to form a basin due to crustal extension and movement on the Garlock fault in the Tehachapi Mountains and the San Andreas fault in the San Gabriel Mountains. Over time, the basin has filled with several thousand feet of alluvial materials that have eroded from the bounding mountain ranges. In particular, ephemeral Cottonwood Creek, emanating from the Tehachapi Mountains, continues to deposit a large volume of sands and gravel in a distributary fan extending into the Project area (Figure 4.5-1). This permeable alluvium constitutes an aquifer, which is an important source of water for local irrigators. The upper, dewatered portion of this aquifer would be used for storage of imported surface water for the proposed Project. No perennial streams flow in the basin.

The area proposed for the recharge and recovery facilities overlies the Neenach Sub-Basin, one of several groundwater sub-basins in the Antelope Valley (Figure 4.5-2). All of the valley alluvium in the Neenach Sub-Basin is classified as *recent alluvium* in the state geologic map atlas (California Division of Mines and Geology 1969), which can include materials in a variety of size classes (e.g., clay, silt, sand, gravel, cobbles, and boulders). This unconsolidated material in some areas includes mixtures of playa clays and windblown sand. Antelope Valley has been complexly faulted, creating several distinct sub-basins in the Project area (Figure 4-5.2) because of lower permeabilities created at the fault surfaces (WDS 2005 [Appendix B]; Leighton and Phillips 2003).

The island of bedrock shown in Figure 4.5-2 (Fairmont Butte) within the otherwise alluvial basin is a complex of Mesozoic-Era *granite* and more recent (Miocene Epoch) volcanic rock (*andesite*), as well as sedimentary rock of terrestrial origin (California Division of Mines and Geology 1969). It is flanked on the west by Pleistocene-aged weakly cemented alluvium, across which the Phase 2 delivery pipeline would pass.

Dibblee (1967) noted that Quaternary alluvium on the surface of the Neenach Sub-Basin generally consists of unconsolidated sand, gravel, and boulders, with small quantities of clay. He suggested that this surface alluvium averages about 100 feet in thickness and unconformably overlies an older alluvium, consisting of poorly sorted sand with some gravel, silt, and clay. However, Bloyd (1967) indicated that surface materials in the Neenach Sub-Basin may also be the older alluvium referred to by Dibblee. The water table, now averaging about 340 feet below the ground surface (bgs) resides in this lower alluvium and supports relatively prolific wells.

Three boreholes drilled into this alluvium in the Project area— to depths of 398, 438, and 478 feet bgs—encountered interbedded sands, gravels, silts, and (to a lesser degree) clays. The overall textural classification of the samples from each test hole was predominately sand. (Layne GeoSciences 2003.)

## Seismic Hazards

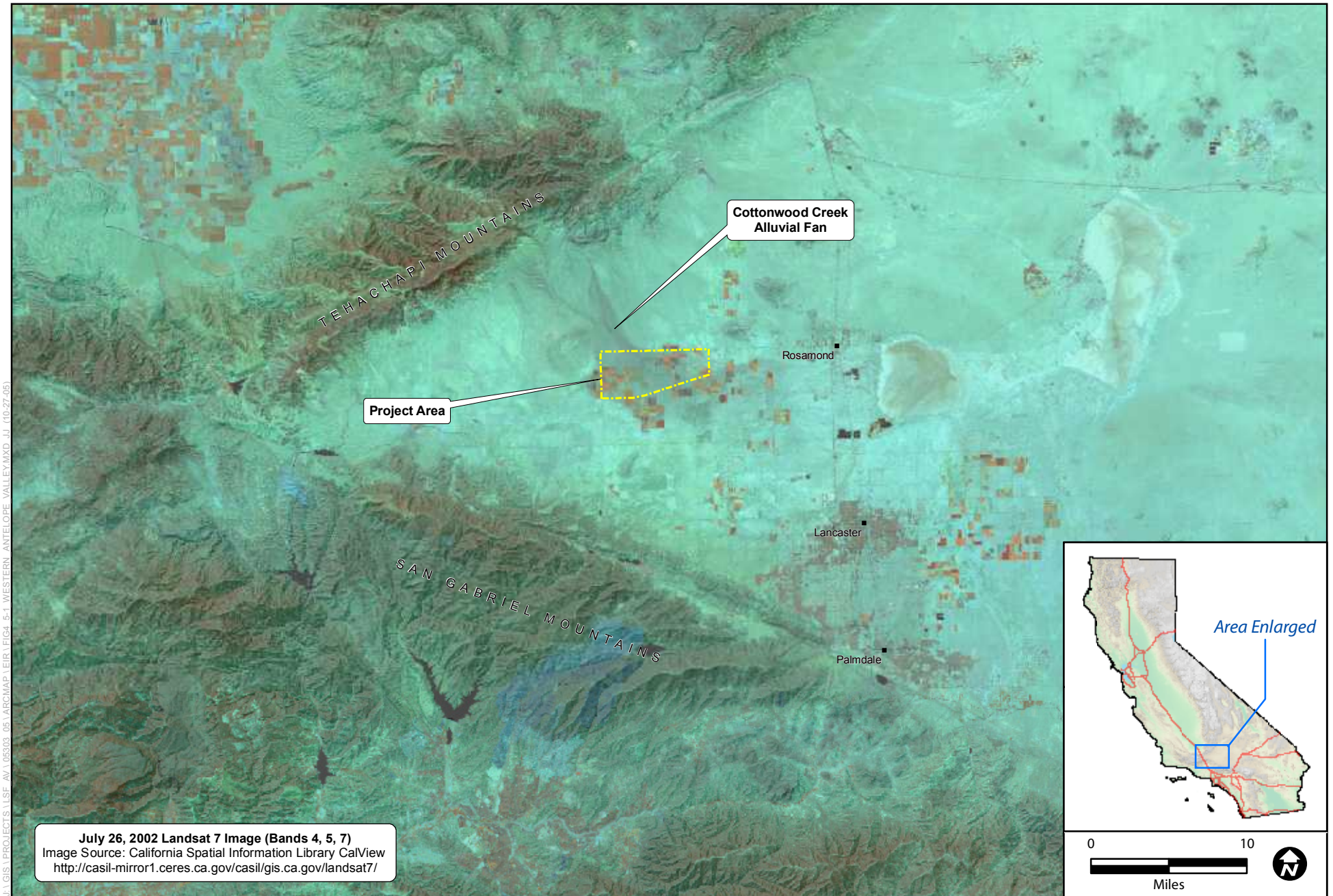
Located near the juncture of the San Andreas and Garlock faults, the Project area is within a zone of significant seismic hazard.

### Faulting

Active and potentially active faults in or near the Project are shown on Figure 4.5-2 and can be characterized as follows:

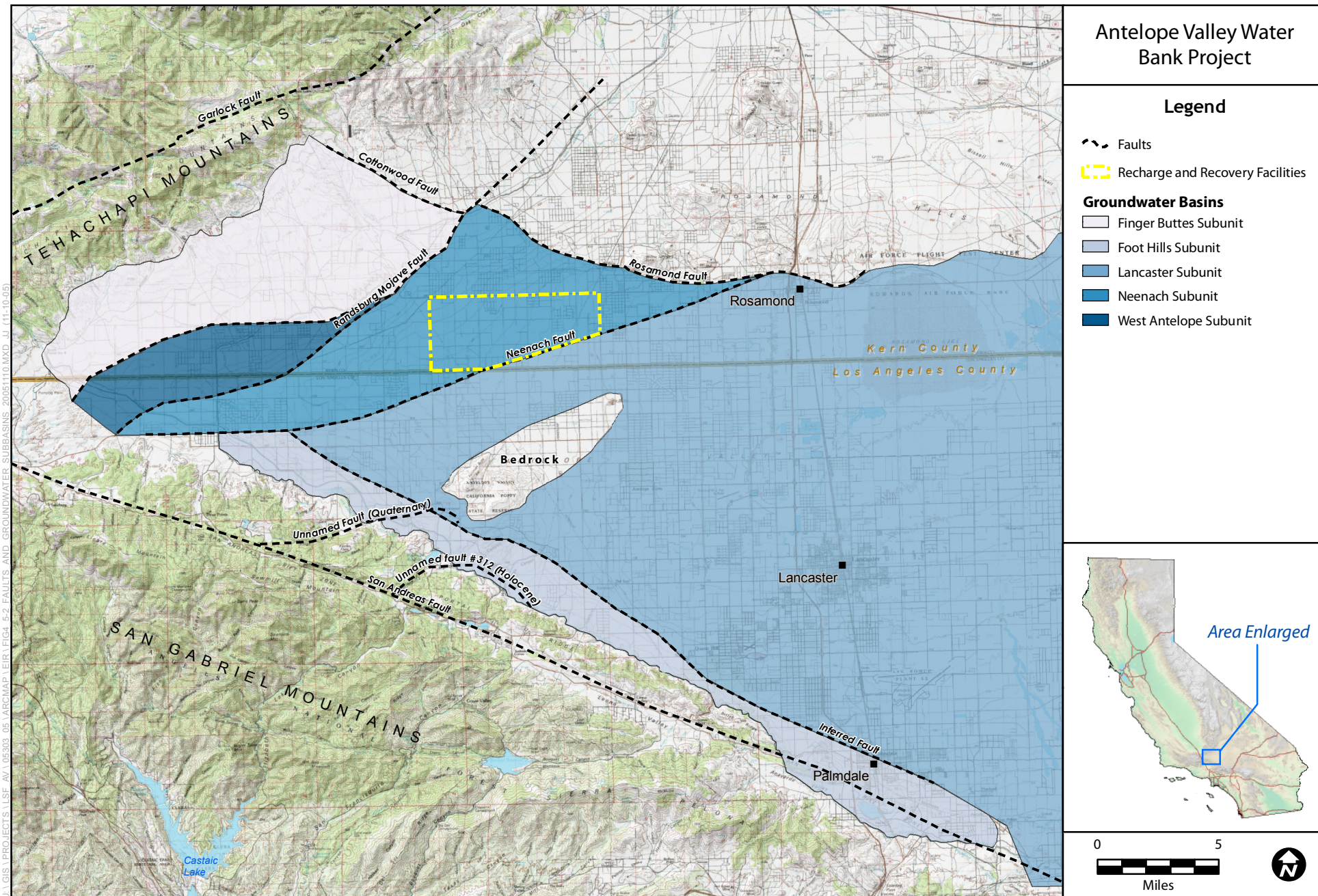
- **Rosamond-Cottonwood Faults.** 1.25 miles from the northeast corner of recharge and recovery area. Potentially active: known Quaternary movement (within the past 1.6 million years).
- **Randsburg Mojave Faults.** 1.25 miles from the northwest corner of the recharge and recovery area. Potentially active: known Quaternary movement.
- **Garlock Fault.** 9.5 miles from northwest corner of recharge and recovery area. Active: known Holocene movement (within past 10,000 years), significant linear trend of accurately located earthquake epicenters, and known historic surface rupture (1952) in short segment north-northeast of the recharge and recovery area.
- **San Andreas Fault.** 2 to 3 miles beyond the south end of the proposed Phase 2 delivery pipeline and 9.5 miles from the southwest corner of the recharge and recovery area. Active: known historic movement in 1857 and 1916; significant linear trend of accurately located earthquake epicenters.





**Figure 4.5-1**  
**Western Antelope Valley and Tehachapi and San Gabriel Mountains**





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**Figure 4.5-2**  
**Faults and Groundwater Subbasins in Project Area**

- **Unnamed Fault Associated with the San Andreas Fault.** The Phase 2 delivery pipeline would cross this fault about 0.75 mile from its terminus at the California Aqueduct. Potentially active: known Quaternary movement.
- **Unnamed Fault #312 Associated with the San Andreas Fault.** About 1.25 miles beyond the south end of the Phase 2 delivery pipeline. Active: known Holocene movement (Jennings 1994).

The Neenach fault and the other inferred fault shown on Figure 4.5-2 may or may not be potentially active, since they have no surface expression and are only inferred to exist (from the difference in groundwater depths between the Neenach, Lancaster, and Foothills Sub-unit groundwater basins). The Neenach fault apparently passes near the area proposed for the recharge and recovery facilities, and both faults pass under the Phase 2 delivery pipeline route (Figure 4.5-2).

The Garlock and San Andreas faults and Fault #312 are designated as Fault-Rupture Hazard Zones under the Alquist-Priolo Fault Zoning Act (Hart and Bryant 1999). The other three faults listed above, the inferred Neenach Fault, and the other inferred fault are not associated with designated rupture zones. Therefore, Project facilities would not be within any currently designated Fault-Rupture Hazard Zones. However, as noted, the Phase 2 delivery pipeline would cross a potentially active, unnamed fault.

### Groundshaking

The Project area has been subject to intense groundshaking from nearby fault ruptures, particularly on the San Andreas fault and on faults near the juncture of the San Andreas and Garlock faults. For example:

- San Andreas:
  - Wrightwood earthquake of 1812—estimated magnitude of 7.5 accompanied by 15+ miles of surface rupture with inferred epicenter 50 to 60 miles southeast of the Project area.
  - Fort Tejon earthquake of 1857—estimated magnitude of 8 accompanied by 200 miles of surface rupture, including past the Project area.
  - Palmdale earthquake of 1857—estimated magnitude of 6.3, with inferred epicenter 25 miles southeast of the Project area.
- White Wolf (northwest of San Andreas-Garlock faults juncture): Tehachapi earthquakes of 1952—estimated magnitudes of 7.3, 6.3, 5.6, and 5.5, with inferred epicenters 35 miles northwest of the Project area (Topozada et al 2000).

Based on the history of these and other earthquakes, development of slip-rate data, and theoretical considerations, the State of California (California Geological Survey 2005) has developed maximum probable earthquake magnitudes for the San Andreas and Garlock faults as follows:



- **San Andreas Fault, Mojave Section.** Maximum probable magnitude of 7.1, with an average return interval of 550 years.
- **Garlock Fault, West Section.** Maximum probable magnitude of 7.1, with an average return interval of 1,000 years (Peterson et al 1996).

State researchers then applied seismic-wave attenuation data to these other earthquakes to estimate the maximum ground shaking that has a 10 percent probability of being exceeded in a 50-year period in the Project area and statewide. For the Project area, the results show:

- Proposed recharge and recovery facilities area—peak ground acceleration of 43 percent of gravity.
- South end of Phase 2 delivery pipeline—peak ground acceleration of 77 percent of gravity.

(Spectral accelerations would be even higher: 59 percent and 100 percent of gravity in the proposed recharge and recovery facilities area for period 1.0- and 0.2-second seismic waves, respectively, and 110 percent and 166 percent of gravity at the Phase 2 delivery pipeline terminus.)

These are relatively high values and require special consideration in designing structures that can withstand the large forces involved.

### **Liquefaction Potential**

Liquefaction may occur when water-saturated sandy soils are subjected to earthquake ground shaking. When soil liquefies, it loses strength and behaves as a viscous liquid (like quicksand) rather than as a solid. This can cause structures to sink into the ground, tilt, or rupture; slopes to fail; nearly level ground to shift laterally tens of feet (lateral spreading); and other related phenomena. Soils of concern are generally those within about 30 feet of the ground surface.

Three borings in the recharge and recovery area for evaluation of Project feasibility showed that the alluvium in the upper 30 feet is composed primarily of sand. Some of it is gravelly sand (5 to 20 percent gravel), some of it is silty sand, and most of it is relatively simply sand (Layne GeoSciences 2003). Given the intensity of expected ground shaking at the site and the presence of sand in the uppermost 30 feet of substrate, saturation of the substrate would create a significant potential for liquefaction to occur during a moderate to large earthquake.

Prior to commencement of significant pumpage for irrigation in the early 1900s, the water table was 150 to 200 feet bgs. By the mid-1970s the water table had dropped to approximately 350 feet bgs. Since that time water levels have stabilized as delivery of SWP water by AVEK has partially replaced groundwater pumpage. At present, groundwater levels average 340 feet bgs and fluctuate annually between 5 and 20 feet around this mean value (WDS 2005 [Appendix B]). Therefore, at present, the upper 30 feet of substrate is not saturated, preventing the occurrence of liquefaction during a large earthquake.

## Subsidence History

Subsidence has occurred in California for two reasons: wind erosion of peat soils or lowering of the water table through pumpage where substrates are susceptible to compaction when dewatered. Compaction from dewatering has principally been observed when clays of lacustrine origin are extensive in the dewatered zone or the aquifer is confined. In the Project area, these conditions are not present. Consistent with this absence, the U.S. Geological Survey noted that no measurable subsidence occurred in the area proposed for the recharge and recovery facilities between 1930 and 1992 (Leighton and Phillips 2003), during which the water table was lowered 150 to 200 feet.

## Soils

Generally, soils are the product of weathering of a substrate or *parent material*. In the Project area, this concept is perhaps too simplistic. Both runoff from the Tehachapi Mountains and persistent wind are continuously adding and removing material from the surface layers. Nevertheless, loamy soils are found in the Project area, usually having a relatively high sand content. Some of them are excessively gravelly.

Soil information described below comes from a Soil Conservation Service soil survey of the area conducted in 1970 (U.S. Soil Conservation Service 1970).

## Climate

The Project area is semi-arid and hot, receiving an average of less than 10 inches of precipitation per year (Bloyd 1967). Average annual potential evaporation (Pan A) is 114 inches/year, and monthly evaporation always exceeds monthly precipitation (Bloyd 1967). However, salinity is not a problem with the area's soils (U.S. Soil Conservation Service 1970). Nonetheless, in the eastern portion of the area proposed for recovery facilities, a caliche layer has developed beneath the topsoil (U.S. Soil Conservation Service 1970).

## Geomorphic Soil Associations

Soils can be described at a more general scale by describing soil associations correlated with macro-geomorphic conditions, and at a finer scale by describing individual, recognizable soil mapping units.

At the soil macro-geomorphic scale, three main soil groups are found in the Antelope Valley area, two of which are in the Project area (U.S. Soil Conservation Service 1970):

- **Soils of the Mojave Desert.** Found in the area proposed for recharge and recovery facilities, comprising the Hesperia-Rosamond-Cajon Association and the Sunrise Association. Average annual precipitation here ranges from 4 to 9 inches per year.
- **Soils of the Alluvial Fans and Terraces Bordering the San Gabriel Mountains.** Found along the Phase 2 delivery pipeline route, comprising the

Hanford-Ramona-Greenfield Association, as well as Hesperia and Rosamond soils. Average annual precipitation here ranges from 9 to 16 inches and is more reliable than in the Mojave Desert

### **Soil Mapping Units and Characteristics**

Seventeen soil mapping units have been delineated in the area proposed for the recharge and recovery facilities, and 18 units along the Phase 2 delivery pipeline route. Six of these units are found in both areas. Table 4.5-1 displays these soil mapping units, where and to what extent they are found relative to the Project, and their key characteristics. Figure 4.5-3 shows those soil units occurring in and around the area proposed for the recharge and recovery facilities.

The data leads to the following observations about Project area soils:

- Most soils in the area proposed for the recharge and recovery facilities are Hesperia or Rosamond soils; along the pipeline route, the Hanford soils are most common.
- Almost all of the soils are loamy sands or sandy loams, consistent with the substrate data previously discussed.
- Soil erosion is the primary problem with use or disturbance of the area's soils. Both wind and water erosion are significant for these soils unless plants form a continuous cover, which is difficult to achieve without irrigation in this dry environment. Each of the soil units has a significant erosion problem, and wind erosion is moderately high to high for the majority of these soils.
- Most all soils have a low shrink-swell potential (which otherwise can threaten integrity of structures) because of the prevailing low clay content; none of them have a high shrink-swell potential.
- Infiltration and runoff rates vary considerably, but higher infiltration rates and lower runoff potential dominate. The Ramona, Rosamond, and Sunrise soils are exceptions and have high runoff potential.

The Sunrise soils have developed a caliche hardpan at a depth of 20 to 40 inches, which is deep enough not to inhibit rooting of row crops and shrubby vegetation. A very small area of soil near the south end of the pipeline route has shallow bedrock; otherwise, soils in the Project area have no restrictive layers (even near Fairmont Butte and the California Aqueduct).

## **Regulatory Framework**

### **Federal Regulations**

#### **Section 402 of the Clean Water Act/National Pollutant Discharge Elimination System**

The 1972 amendments to the federal Water Pollution Control Act established the NPDES permit program to control discharges of pollutants from point sources

**Table 4.5-1. Characteristics of Soils in the Project Area**

Map Symbol	Recharge/ Recovery Area (acres, % of total)	Pipeline Length (feet, % of total)	Soil Unit Name and Slope	Use Limitation; Primary Limiting Factor	Major Soil Problem	Wind Erodibility and Group <sup>a</sup>	Depth to Restrictive Layer	Shrink-Swell Potential	Hydro-logic Group <sup>b</sup>	Perc. Rate (feet/day) <sup>c</sup>	% of Hydric Soils <sup>d</sup>
CaA	177 1.5	–	Cajon loamy sand; 0–2%	Very severe; erosion	Excessive gravel	High (2)	>5 feet	Low	A	–	3
CaC	103 0.9	–	Cajon loamy sand; 2–9%	Very severe; erosion	Excessive gravel	High (2)	>5 feet	Low	A	–	0
CbA	573 5.0	–	Cajon loamy sand; 0–2% loamy substratum	Very severe; erosion	Excessive gravel	High (2)	>5 feet	Low–moderate	A	–	1
GsA	–	2,550 5.6	Greenfield sandy loam; 0–2%	Moderately severe; erosion	Eroding	Moderately high (3)	>5 feet	Low	B	–	1–5
GsC	–	2,600 5.7	Greenfield sandy loam; 2–9%	Moderately severe; erosion	Eroding	Moderately high (3)	>5 feet	Low	B	–	0
GsC2	–	1,700 3.7	Greenfield sandy loam; 2–9%	Moderately severe; erosion	Eroding	Moderately high (3)	>5 feet	Low	B	–	1
HaB2	–	1,500 3.3	Hanford loamy sand; 2–5% hummocky	Moderately severe; erosion	Eroding	High (2)	>5 feet	Low	A	–	1
HbA	–	14,600 32.0	Hanford coarse sandy loam; 0–2%	Moderately severe; erosion	Eroding	Moderately high (3)	>5 feet	Low	A	–	1–5
HbC	–	2,900 6.4	Hanford coarse sandy loam; 2–9%	Moderately severe; erosion	Eroding	Moderately high (3)	>5 feet	Low	A	–	0
HcA	–	2,650 5.8	Hartford sandy loam; 0–2%	Moderately severe; erosion	Eroding	Moderately high (3)	>5 feet	Low	B	–	1
HgA	2,354 20.4	–	Hesperia loamy fine sand; 0–2%	Very severe; erosion	Excessive gravel	High (2)	>5 feet	Low	B	21.1	1
HgA2	384 3.3	–	Hesperia loamy fine sand; 0–2% hummocky	Very severe; erosion	Excessive gravel	High (2)	>5 feet	Low	B	–	1

Table 4.5-1. Continued

Map Symbol	Recharge/ Recovery Area (acres, % of total)	Pipeline Length (feet, % of total)	Soil Unit Name and Slope	Use Limitation; Primary Limiting Factor	Major Soil Problem	Wind Erodibility and Group <sup>a</sup>	Depth to Restrictive Layer	Shrink-Swell Potential	Hydro-logic Group <sup>b</sup>	Perc. Rate (feet/day) <sup>c</sup>	% of Hydric Soils <sup>d</sup>
HkA	1,960 17.0	5,000 11.0	Hesperia fine sandy loam; 0–2%	Very severe; erosion	Eroding	Moderately high (3)	>5 feet	Low	B	2.3	2
HkB	349 3.0	750 1.6	Hesperia fine sandy loam; 2–5%	Very severe; erosion	Eroding	Moderately high (3)	>5 feet	Low	B	5.9	0
HmA	99 0.9	–	Hesperia fine sandy loam; 0–2% loamy substratum	Very severe; erosion	Eroding	Moderately high (3)	>5 feet	Low–moderate	B	–	1
HnA	285 2.5	–	Hesperia loam; 0–2%	Very severe; climate	Eroding	Moderate (5)	>5 feet	Low	B	–	1
RcA	–	1,200 2.6	Ramona coarse sandy loam; 0–2%	Moderately severe; erosion	Eroding	Moderately high (3)	>5 feet	Low	C	–	1
RcB	–	200 0.4	Ramona coarse sandy loam; 2–5%	Moderately severe; erosion	Eroding	Moderately high (3)	>5 feet	Low	C	–	0
RcD	–	800 1.8	Ramona coarse sandy loam; 9–15%	Moderately severe; erosion	Eroding	Moderately high (3)	>5 feet	Low	C	–	1
Rm	465 4.0	1,500 3.3	Rosamond loamy fine sand	Very severe; erosion	Excessive gravel	High (2)	>5 feet	Low–moderate	C	5.3	1
Rm2	69 0.6	–	Rosamond loamy fine sand; hummocky	Very severe; erosion	Excessive gravel	High (2)	>5 feet	Low–moderate	C	–	1
Ro	2,234 ac 19.4%	3,450' 7.6%	Rosamond fine sandy loam	Very severe; erosion	Eroding	Moderately high (3)	>5 feet	Low	C	9.2	1
Rp	1,312 11.4	2,600 5.7	Rosamond loam	Very severe; climate	Eroding	Moderate (5)	>5 feet	Low	C	3.7	1
Rt	15 0.1	900 2.0	Rosamond silty clay loam	Very severe; climate	Eroding	Moderate (5)	>5 feet	Moderate	C	–	1



**Table 4.5-1. Continued**

Map Symbol	Recharge/ Recovery Area (acres, % of total)	Pipeline Length (feet, % of total)	Soil Unit Name and Slope	Use Limitation; Primary Limiting Factor	Major Soil Problem	Wind Erodibility and Group <sup>a</sup>	Depth to Restrictive Layer	Shrink-Swell Potential	Hydrologic Group <sup>b</sup>	Perc. Rate (feet/day) <sup>c</sup>	% of Hydric Soils <sup>d</sup>
Sv	433 3.8	–	Sunrise sandy loam	Very severe; erosion	Eroding	Moderately high (3)	Petrocalcic 20–40 inches	Low	C	–	1
Sw	436 3.8	–	Sunrise sandy loam; shallow	Very severe; erosion	Eroding	Moderately high (3)	Petrocalcic 20–40 inches	Low	C	–	1
Sx	285 2.5	–	Sunrise loam	Very severe; erosion	Eroding	Moderate (4)	Petrocalcic 20–0 inches	Low	C	–	1
TsF	–	500 1.1	Terrace escarpments	Very severe; erosion	Eroding	Not stated	Not stated	Not stated	Not stated	–	0
VsE2	–	250 0.5	Vista coarse sandy loam; 15–30% eroded	Severe; erosion	Eroding	Moderately high (3)	Bedrock 20–40 inches	Low	B	–	0

Notes:

<sup>a</sup> Wind erodibility groups: Natural Resources Conservation Service (NRCS) groups range from 1 (most susceptible) to 8 (least susceptible). Relative descriptors developed by J&S.

<sup>b</sup> Hydrologic soil group classes:

A = high infiltration rate; low runoff potential.

B = moderate infiltration rate; moderate runoff potential.

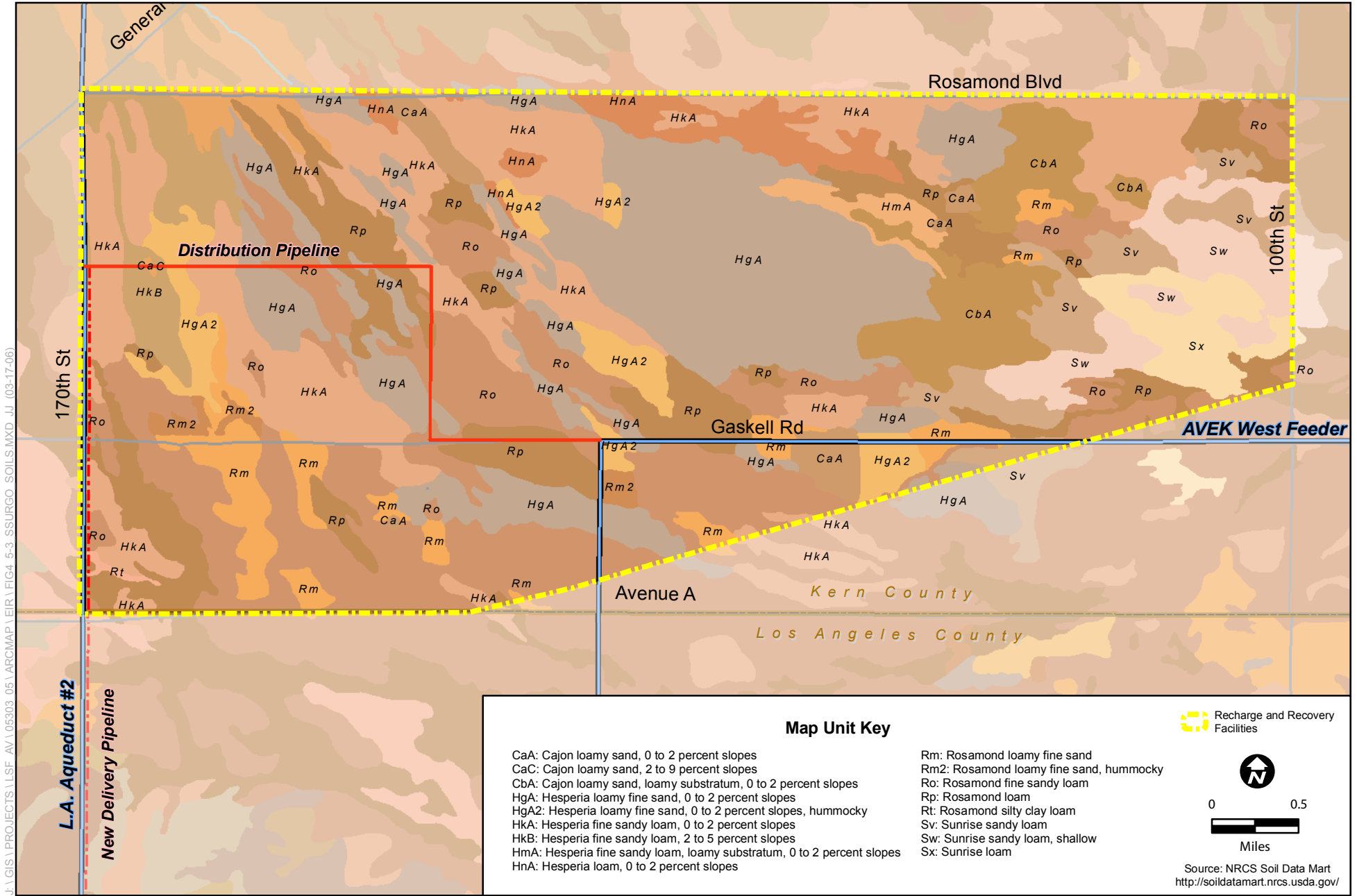
C = slow infiltration rate; high runoff potential.

D = slow infiltration rate; very high runoff potential.

<sup>c</sup> Percolation rate measured in project-area trenches

<sup>d</sup> Hydric soils are wetland soils where surface runoff is impounded seasonally or a perched water table is seasonably shallow.

Source: U.S. Soil Conservation Service 1970, except percolation rate data from Layne Geosciences 2003.



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**Figure 4.5-3**  
**SSURGO Soil Mapping Units**

(Section 402). The 1987 amendments to the CWA created a new section of the CWA devoted to stormwater permitting (Section 402[p]). The EPA has granted the State of California primacy in administering and enforcing the provisions of the CWA and the NPDES permit program. The NPDES permit program is the primary federal program that regulates point source and nonpoint-source discharges to waters of the United States.

The State Water Resources Control Board issues both general and individual permits for certain activities. Relevant general and individual NPDES permits are discussed below.

### **Construction Activities**

Construction activities are regulated under the NPDES General Permit for Storm Water Discharges Associated with Construction Activities (General Construction Permit), provided that the total amount of ground disturbance during construction exceeds 1 acre. The Lahontan Regional Water Quality Control Board enforces the General Construction Permit in this area. Coverage under a General Construction Permit requires the preparation of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP includes pollution prevention measures (erosion and sediment control measures and measures to control non-stormwater discharges and hazardous spills), demonstration of compliance with all applicable local and regional erosion- and sediment-control standards, identification of responsible parties, a detailed construction timeline, and a BMP monitoring and maintenance schedule. Permittees are required to conduct annual monitoring and reporting to ensure that BMPs are correctly implemented and effective in controlling the discharge of stormwater-related pollutants. The owner/operator would need to obtain coverage under the NPDES General Construction Permit prior to any construction activities exceeding 1 acre.

## **State Regulations**

### **California Building Standards Code**

The State of California's minimum standards for structural design and construction are given in the California Building Standards Code (CBSC) (California Code of Regulations, Title 24). The CBSC is based on the Uniform Building Code, which is used widely throughout the United States (generally adopted on a state-by-state or district-by-district basis) and has been modified for California conditions with numerous, more detailed, and/or more stringent regulations.

The CBSC requires that "classification of the soil at each building site...be determined when required by the building official" and that "the classification... be based on observation and any necessary test of the materials disclosed by borings or excavations." In addition, the CBSC states, "the soil classification and design-bearing capacity shall be shown on the [building] plans, unless the foundation conforms to specified requirements." The CBSC provides standards for various aspects of construction, including earthquake forces to be expected in various zones of the state, construction on expansive soils, foundation investigations, and liquefaction potential and soil strength loss. In accordance

with California law, Project design and construction would be required to comply with provisions of the CBSC.

## Local Regulations

### Kern County Code

Provisions of the Kern County Code require issuance of a grading permit, a well drilling and construction permit, and encroachment permits for implementation of the proposed Project. Because no structures (buildings) are being proposed, no building permits would be required for Project implementation.

Chapter 17.28 of the Kern County Code, "Grading Code," requires that a grading permit be obtained for earthmoving projects unless specifically exempted. The code exempts fills of less than 50 cubic yards if less than 3 feet deep and not intended to support structures. Project berms would be up to 5 feet high and would therefore not be exempt. Excavations for utilities are exempt, however. Accordingly, the Project would require a grading permit for basin and berm construction but not for pipeline burial.

The Kern County grading code does not specifically call for preparation of an erosion control plan but does specify that soil erosion be controlled:

The faces of cut and fill slopes shall be prepared and maintained to control against erosion. This control may consist of effective planting. The protection for the slopes shall be installed as soon as practicable and prior to calling for final approval. Where cut slopes are not subject to erosion due to the erosion-resistant character of the materials, such protection may be omitted.

The Kern County well drilling and construction permit requires that design and construction of the wells preclude contamination of groundwater. The county's encroachment permits for pipeline installation under or along county roads requires that road structures not be adversely affected and that public safety is ensured during construction.

### Kern County General Plan

The Kern County General Plan, adopted June 15, 2004, contains the following policies.

#### ***Land Use/Conservation/Open Space Element Resource***

##### ■ **Implementation Measures**

- Use the California Geological Survey's latest maps to locate mineral deposits until the regional and statewide importance mineral deposits map has been completed, as required by the Surface Mining and Reclamation Act.

**Safety Element*****Seismically Induced Surface Rupture, Ground Shaking, and Ground Failure***

- Implementation Measures
  - The fault zones designated in the Kern County Seismic Hazard Atlas should be considered significant geologic hazard areas. Proper precautions should be instituted to reduce seismic hazard, whenever possible, in accordance with State and County regulations.
  - Require that plans and permits for installation of major lifeline components such as highways, utilities, petroleum, or chemical pipelines to incorporate design features to accommodate potential fault movement in areas of active faults without prolonged disruption of essential service or threat to health and safety.

**Willow Springs Specific Plan**

Relevant goals, policies, and implementation measures from the Willow Springs Specific Plan (WSSP) are provided below.

**Resource Element**

- Mitigation/Implementation Measures
  - All grading and landform modifications shall be conducted in conformance with state-of-the-practice design and construction parameters. Typical standard minimum guidelines are set forth in Chapter 70 of the Uniform Building Code. All graded slopes shall be constructed so that the entire slope is stable.
  - Prior to grading permit issuance, evaluation of the collapse/hydroconsolidation potential and other engineering parameters of the various alluvial and lacustrine sediments and to provide appropriate remedial grading recommendations, a comprehensive geotechnical investigation, including exploratory drilling/trenching, sampling, and laboratory testing shall be required.
  - Remedial grading and removal shall be performed on the sites, which consist of erodible and collapsible soils prior to site development.
  - Prior to issuance of any grading permits for individual projects, individual project applicants shall consult with the Regional Water Quality Control Board, State Department of Fish and Game, and/or U.S. Fish and Wildlife Service, and the Army Corps of Engineers to identify potentially required permits. Compliance with this measure will be confirmed through the submittal of a letter (in conjunction with submittal of grading permit applications) to the County demonstrating compliance with the above-mentioned agencies.
  - Prior to issuance of grading permits, individual project applicants shall obtain all appropriate permits as determined necessary by the Regional Water Quality Control Board, U.S. Fish and Wildlife Service, State Department of Fish and Game, and the Army Corps of Engineers.

**Seismic/Safety Element**

- Policies
  - Compliance with site-specific issues, goals, policies, and implementation measures contained in the Seismic/Safety Element of the Kern County General Plan.
  - All new construction in the plan area shall comply with Chapter 23 of Uniform Building Code, which includes building pad and foundation design standards for structures in Uniform Building Code Seismic Zone IV.

**Los Angeles County Code**

Provisions of the Los Angeles County Code require issuance of encroachment permits for pipeline construction within county road rights-of-way. Pipeline installation is exempt from requirements for a grading permit, and no wells would be constructed in Los Angeles County. Because no structures (buildings) are being proposed, no building permits would be required for Project implementation.

**Los Angeles County General Plan**

A relevant goal and policies from the Los Angeles County General Plan are provided below.

**Safety Element**

- Goal
  - Minimize injury and loss of life, property damage, and the social, cultural, and economic impacts caused by earthquake hazards.
- Policies
  - Encourage the use of nonurbanized segments of active fault zones for rural and open space purposes.
  - Continue enforcement of stringent site investigations (such as seismic, geologic, hydrologic, and soils investigations) and implementation of adequate hazard mitigation measures for development of projects in areas of high earthquake hazard, especially those involving critical facilities. Do not approve proposals and projects which cannot mitigate safety hazards to the satisfaction of responsible agencies.

**Antelope Valley Areawide General Plan**

Relevant policies from the Antelope Valley Areawide General Plan are provided below.

**Land Use****Environmental Hazards and Constraints**

- Policy
  - Designate areas within the Alquist-Priolo Seismic Special Studies Zone and other identified seismic areas as “Seismic Safety Management Areas.” Provide for special development standards in these areas.

### **Seismic Safety** *General Policies*

#### ■ Policies

- Establish and enforce standards and criteria to reduce unacceptable levels of seismic risk.
- Require all new development and appropriate existing development to comply with established seismic safety standards.

## **Impact Analysis**

This section describes the CEQA impact analysis relating to geology, soils, and seismicity for the Project. It describes the methods used to determine the Project's impacts and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion.

## **Methodology**

Environmental effects of the proposed Project were identified using the best professional judgment of our staff geologist and employing thresholds of impact significance discussed below.

## **Thresholds of Significance**

The Kern County CEQA Implementation Document and Kern County Environmental Checklist state that a project would have a significant impact on geology and soils if it would:

- expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault (refer to Division of Mines and Geology Special Publication 42);
  - strong seismic groundshaking;
  - seismic-related ground failure, including liquefaction; or
  - landslides;
- result in substantial soil erosion or the loss of topsoil;
- be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;

- be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property;
- have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

## Impacts and Mitigation Measures

### Impact 4.5-1: Potential Exposure of Structures to Damage from Surface Fault Rupture

Faulting resulting in surface rupture could occur in the Project area. Surface rupture of an unnamed but potentially active fault about 0.75 mile north of the California Aqueduct could damage the Phase 2 delivery pipeline that would cross it. Also, surface rupture of the inferred Neenach fault or another inferred fault across the pipeline route cannot be ruled out, although their potential for activity is unknown. Displacement during any surface rupture of these faults would be relatively small because they are short, local faults. However, rupture could shear the buried pipeline and cause flooding in the vicinity.

Some possibility exists that such local flooding could damage residential or farm structures if they are located in the immediate vicinity, but the probability of such an event is small. The pipeline would only be used during periods of recharge or recovery. If a rupture were to occur when the pipeline is conveying water, flow in the pipeline would be shut down and released water would tend to infiltrate the nearby soils (most soils in the area are relatively permeable, and none are highly impermeable). There are very few homes near the proposed Phase 2 delivery pipeline alignment. Water that contacted a structure foundation would not be deep enough to cause structural damage (or to threaten persons). Accordingly, this potential impact is less than significant. See also Section 4.7, Hydrology and Water Quality.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

### Impact 4.5-2: Potential Exposure of Structures to Damage from Strong Seismic Groundshaking

The Project area would be subjected to strong ground shaking during major earthquakes that would undoubtedly occur on the San Andreas Fault and probably other faults in the region. Within 50 years, there is a 10 percent probability that the area proposed for the recharge and recovery facilities would be subject to peak ground accelerations of 43 percent of gravity, and the south end of the Phase 2 delivery pipeline would be subject to peak accelerations of 77 percent of gravity (spectral accelerations would be even higher).



As noted under Regulatory Framework, the CBSC imposes standards that require designers of the Project facilities to accommodate such predictable forces. The Kern County Building Code states that Section 1629.4.1 of the Uniform Building Code is amended by adding a paragraph stating that all unincorporated territory in the county of Kern is designated Seismic Zone 4 for the purposes of the Code of Building Regulations.

Because of their relatively small size (i.e., less than 6 feet high), the check structures and peripheral berms would not fall under the jurisdiction of the California Department of Water Resources Division of Safety of Dams. Nonetheless, a Professional Engineer certified by the State of California would design the peripheral berms surrounding the recharge basins and oversee their construction. During recharge operations these berms would be inspected daily for signs of weakness (e.g., cracks, rodent damage, boils, seepage) and to discourage trespass and vandalism. The water surface elevation would be monitored via telemetry to prevent over-topping of the recharge basins, and the application of water would be shut-off automatically if the elevation exceeded freeboard criteria established by the Monitoring Committee.

In the event that an individual check structure was to fail, the water lost from that basin would be contained within peripheral berms. In the unlikely event of the failures of multiple check structures and the peripheral berm, as might be caused by a significant earthquake, catastrophic results are not expected. The depth of water within the basins would average 1-2 feet and would not exceed 4 feet. Water released from recharge berm failure or pipeline failure would tend to infiltrate agricultural soils nearby (most soils in the area are relatively permeable soils; none are highly impermeable) or follow the north-south trending dirt roads in the area, as stormwater run-off currently does. Spilled water that did contact a structure foundation would not be deep enough to cause structural damage (or to threaten persons). Accordingly, this potential impact is less than significant.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

### **Impact 4.5-3: Potential Exposure of Structures to Damage from Seismic-Related Liquefaction**

Three elements must be present to result in substrate liquefaction during an earthquake: sandy substrates within about 30 feet of the surface, substrate saturation, and intense ground shaking. In the Project area in general, the substrate would not be saturated at this shallow depth. As a result, widespread liquefaction would not occur during an earthquake.

An exception might be during periods of recharge, when the substrates under the infiltration basin berms are saturated. If a large earthquake coincided with a period of recharge, the berms could fail due to underlying liquefaction.

The probability of such an event is relatively low. The estimated average return periods for magnitude 7 earthquakes on the San Andreas and Garlock faults are 550 and 1,000 years, respectively, although smaller earthquakes occurring more frequently may cause liquefaction. If recharge occurs in 3 years of each 10 years and has a duration of up to 140 days, on the average, the probability of recharge occurring on any given day is a little more than 10 percent. The product of the probability of the occurrence of a large earthquake with the probability of recharge being underway is very small.

Given that liquefaction failure is improbable and the limited consequences of such a failure, this potential impact is less than significant.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

#### **Impact 4.5-4: Potential Damage from Subsidence Caused by Drafting Groundwater**

The applicant expects that the water table may rise up to 300 feet beneath the recharge basins during recharge periods and decline approximately 300 feet to pre-Project conditions during recovery periods. Variations in water levels away from the recharge basins would gradually lessen. If the Project area substrates were prone to subsidence from dewatering, this degree of water table fluctuation could cause consequential subsidence. No subsidence was observed when the pre-pumpage water table was lowered a substantial amount (150 to 200 feet). Accordingly, subsidence is very unlikely to occur as a result of the Project.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** No impact.

#### **Impact 4.5-5: Potential Structural Damage Caused by Expansive Soil**

All but one soil type in the Project area have low or low-to-moderate shrink-swell potential; one soil type has moderate potential. None of the soils would be classified as expansive according to Table 18-1-B of the Uniform Building Code. However, if local areas with expansive soils were encountered, engineered Project facilities would be designed according to the Uniform Building Code to prevent structural damage from soil expansion and contraction.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** No Impact.

## **Impact 4.5-6: Potential Substantial Soil Erosion or Loss of Topsoil from Land Grading and Project Operation**

### **Construction Period**

Soils in the Project area are highly susceptible to water or wind erosion or both. Therefore, if land grading for Project construction does not include special precautions, short-term losses of topsoil and subsoil due to wind and water erosion could be substantial. Also, grading could involve mixing topsoils and subsoils and therefore effectively result in a loss of topsoil.

Soil losses by water and wind would redistribute soil particles to lands within and beyond the Project area, but would be unlikely to cause stream sedimentation because only ephemeral streams are present in the area.

An increase in wind erosion could have an adverse effect on air quality (see Section 4.2, Air Quality, for a discussion of these air quality impacts).

Topsoil materials will be stripped from most areas to be graded, temporarily stockpiled, and reapplied as a top-dressing once final grade is attained. In the recharge basins, this measure will ensure that organic matter and topsoil texture will be preserved in the post-Project soils, allowing agriculture to continue.

For berms and pipeline routes, this measure will create favorable conditions for revegetation to prevent long-term soil loss. The strippings, which would contain the rhizomes and seeds of native and naturalized grasses and forbs, will serve as the main seedbank for revegetation of the non-basin surfaces.

Temporary stockpiles will be watered to prevent topsoil loss from wind erosion; therefore, no loss of topsoil will occur.

### **Operation Period**

Over the longer term, some further losses of soil could occur but to a much lesser degree. The recharge basins would be used for agriculture when not subject to recharge use; therefore, soils would have plant cover and would be wet much of the time, as they are now. During periods of recharge, soils would be covered by water. Thereafter, soils may be exposed to wind and rain erosion for a period before crops can be established, but this regime would not be substantially different from the current cropping regime. Moreover, the basins would be closed systems in which water-eroded soils would remain within bermed areas for redistribution during agricultural plowing. Therefore, over the long term, no net change to existing soil loss from the recharge-basin parcels would be expected to occur.

Berms surrounding the recharge basins may not naturally revegetate well because their morphology and texture would tend to make them droughty. Although some weed cover may develop, if it is not dense, soils could continue to be exposed to water and wind erosion over the long term. Some soils eroded from berms by water would be deposited in the recharge basin, so net soil loss would

not occur. Soils eroded by water from external berm faces—as well as soils eroded from any berms surface by wind—may be lost from the Project area.

Backfill over the distribution pipeline, recovery pipelines, and Phase 2 delivery pipeline also may be subject to long-term loss attributable to water and wind erosion. However, some of these pipelines would be buried in road shoulders and others would be recommitted to agricultural uses. Both surface uses would largely prevent long-term soil erosion of these corridors. However, to the degree that the pipeline burial results in mixing topsoil with subsoil and compaction occurs, these corridors could remain barren or colonized by sparse weedy vegetation. Bare or sparsely vegetated soils could continue to erode.

#### **Mitigation Measures:**

***Mitigation Measure 4.5-1:*** Topsoil materials will be stripped from areas to be graded, temporarily stockpiled, and reapplied as a top-dressing once final grade is attained. The temporary stockpiles will be watered to prevent topsoil loss from wind erosion. For soils having little organic matter in the surface layer and little evidence of soil profile development (i.e., similar texture between surface soil and substrate at depth), this measure will not need to be applied because it would provide little or no benefit. This determination will be made during preparation of a SWPPP.

***Mitigation Measure 4.5-2:*** To control water and wind erosion during construction of the Project, the owner/operator will prepare a Stormwater Pollution Prevention Plan (SWPPP) in compliance with the requirements of the National Pollutant Discharge Elimination System (NPDES) General Construction Permit. The Lahontan Regional Water Quality Control Board will administer the SWPPP. The SWPPP will prescribe temporary Best Management Practices (BMPs) to control wind and water erosion during and shortly after construction of the Project and permanent BMPs to control erosion and sedimentation once construction is complete. An erosion-control plan shall be prepared and submitted in conjunction with the application for a grading permit from Kern County Engineering and Survey Services Department. The SWPPP shall include:

- areas where top-dressing will be applied after final grading and location and maintenance of temporary stockpiles,
- where and how ephemeral watercourses will be protected from soil erosion and sedimentation;
- whether nutrients in post-grading soils in basin bottoms should be supplemented to counter effects of soil disturbance to ensure that agricultural uses in them can continue, so that soils continue to be protected from erosive wind and water;
- whether and where berms and pipeline backfill should be artificially revegetated (e.g., hydroseeded) to ensure protection of soils against wind and water; and

- what performance standards are appropriate for plant cover in this environment to ensure soil protection, including a plant and seed list.

**Level of Significance after Mitigation:** Less than significant.

## Cumulative Impact

Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The cumulative impact scenario for the Project includes seven specific projects identified by Kern and Los Angeles Counties, and buildout of the Kern County General Plan. A detailed description of the cumulative impact scenario considered with the proposed Project is provided in Chapter 3, “Project Description,” and the project list is presented below.

A cumulative impact analysis first identifies whether a cumulatively significant impact exists in the given resource area. If so, it determines whether the project will make a considerable contribution to that impact. Where a cumulative impact is severe, even a small contribution may be considerable (Section 15130(b) of the State CEQA Guidelines).

**Table 4.5-2.** Relevant Cumulative Projects

Case Number (if applicable)	Project Name	Project Location	Approximate Distance to Project Site	Project Type	Project Description
<b>Kern County</b>					
GPA 1, Map 218	Tejon Mountain Village Specific Plan	East of I-5 in the hills north and east of Castaic Lake	14 miles northwest of project site	Major Residential/commercial/recreational development	3,450 single family units (s.f.u.) homes on 23,000-acre planning area,
GPA, Map 255	Lebec Canyon Estates	East of Frazier Mountain Park Road/I-5 interchange	22 miles west of project site	Residential development	32 s.f.u on 1,000 acres
SPA 8, Map 254, Amend. Zone Map 254, Zone Change 6, SP 1, Map 254, Vesting Tent. Tract 6436	Frazier Park Estates	Southern boundary of Kern Co. and portion of LA County, west of I-5 south of Frazier Mountain Park Road	24 miles west of project site	Residential / Commercial development	705 s.f.u. and 135 thousand sq. ft of commercial on 847 acres in Kern County and 323 in LA County
GPA to 5.7, Map 215	Christine Bower	One quarter mile west of 105 <sup>th</sup> Street and McConnell Road near Rosamond	3 miles north of project site	General Plan Amendment and Zone	4 s.f.u on 20-acre site
ZC to A-1, Map 231	Julien and Assoc.	8684 Sweetser Road, Rosamond (APN 315-081-09)	3-1/2 miles northeast of project site	Commercial greenhouses	60-acre site
<b>Los Angeles County</b>					
N/A	Centennial Specific Plan	1 mile east of I-5, adjacent to SR-138	12 miles southwest of project site	Large-scale new community; including residential/commercial development	23,000 dwelling units and 14 million sq. ft. commercial on 11,700 acres
N/A	Gorman Ranch	Gorman Post Road, north of SR-138, east of I-5	17 miles southeast of project site	Residential	227 s.f.u. on 2,500 acres

## Kern County General Plan and Relevant Projects

The proposed Project area is in a seismically active region containing several major faults considered components of the San Andreas Fault System. These conditions exist throughout Kern County (and Los Angeles County) to varying degrees. There are no areas of Kern County or northern Los Angeles County that are not considered seismically active. The list of projects identified above and in Chapter 3, "Project Description," all have varying degrees of vulnerability in a seismic event, with the degree of impacts being directly related to the site-specific details of location of faults, location of structures, areas of potential liquefaction, subsidence, and unstable slopes. Cumulative impacts for projects in a seismic event and for unstable slopes could occur if projects placed a potential hazard near a populated area that could be a danger during a seismic event.

The **Centennial Specific Plan and Tejon Mountain Village Specific Plan** are the subject of review in separate EIRs that will require conformance to the Kern County General Plan and Los Angeles County General Plan, both of which require the mitigation of seismic hazards and engineering to ensure slope stability.

As identified in Impact 4.5-6, the proposed Project has the potential to result in soil erosion and loss of topsoil from grading and operations. Similar effects would also result from the smaller local projects (such as **Bower and Julien**) as well as the larger regional projects (such as **Tejon Mountain SP and Centennial**). Buildout of the General Plan could also potentially result in cumulative impacts (without mitigation). Design and mitigation requirements by Kern and Los Angeles Counties will minimize these impacts to a less-than-significant level, barring unforeseen catastrophic geologic events.

During the construction of the proposed Project, the soils on the site could be susceptible to water or wind erosion, or both, without special precautions. Over the long term, additional erosion could occur in the recharge basins when the soil is inundated, although to a much lesser degree because the basins are part of a "closed loop" system. These effects, without mitigation, could occur in conjunction with erosion from other projects in the area, potentially contributing to a cumulative impact.

### **Mitigation Measures:**

The potential for soil erosion will be minimized through the implementation of Mitigation Measures 4.5-1 (salvage and reapply topsoil) and 4.5-2 (prepare and implement a SWPPP). These measures will reduce the potential impacts on geologic and soil resources at the Project site to a less-than-significant level.

**Level of Significance after Mitigation:** Cumulative impacts would be less than significant.

## 4.6 Hazards and Hazardous Materials

### Introduction

This section describes the environmental setting for hazards and hazardous materials, the impacts from hazards and hazardous materials that would result from the Project, and feasible mitigation measures to reduce impacts.

### Environmental Setting

#### Existing Conditions

Currently, the majority of the Project area is used for agricultural production or is undeveloped. It is likely that pesticides, herbicides, and other agricultural chemicals have been applied throughout the Project area.

There are no schools located within the Project vicinity.

#### Hazardous Materials

Hazardous materials and wastes are those substances that, because of their physical, chemical, or other characteristics, may pose a risk of endangering human health or safety or of endangering the environment (California Health and Safety Code Section 25260). Types of hazardous materials include petroleum hydrocarbons, pesticides, and volatile organic carbons (VOCs). Within the Project area, most potential hazardous waste sites are associated with agricultural production activities and may include storage facilities and agricultural pits or ponds contaminated with fertilizers, pesticides, or herbicides.

The locations of potential hazardous waste sites in the Project area were mapped by Environmental Data Resources (EDR) (see Appendix G). EDR queried federal, state, and local databases to search for contaminants within 1 mile of the Project area. Four sites where hazardous materials have been used or disposed were identified:

- Organic Choice Limited, 12622 Holiday Avenue, Rosamond, is listed in the HazNet database as a waste oil and mixed oil recycler.
- Wil Mar Farms, 1747 100th Street West, Rosamond, is listed in the state's Underground Storage Tank (UST) database.
- Weaver Ranch, Gaskell Road at 100th Street West, is listed in the state's UST database.



- Lancaster Ranches, Gaskell Road at 150th Street West, is listed in the state's UST database as having a 1,000-gallon diesel tank and a 1,000-gallon gasoline tank, both installed in 1965.

In addition to the database search, a specific assessment of the parcels that would be used for recharge basins was performed. The assessment included visual inspections, interviews with current property owners, 17 exploratory trenches, and the collection and analysis of six groundwater samples (two from irrigation wells and four from undeveloped boreholes). No indication of contamination was found. (WDS 2005 [Appendix B]).

## **Airport and Military Aviation Operations**

Edwards Air Force Base lies 15 miles to the east. A private airstrip, Skyotee Ranch Airport, is located just east of the area proposed for the recharge basins (Figure 4.6-1). The Kern County Airport Land Use Compatibility Plan (ALUCP) indicates that the proposed Project is located in an area associated with low-level military flight paths that are used to train personnel and test weapons systems associated with Edwards Air Force Base.

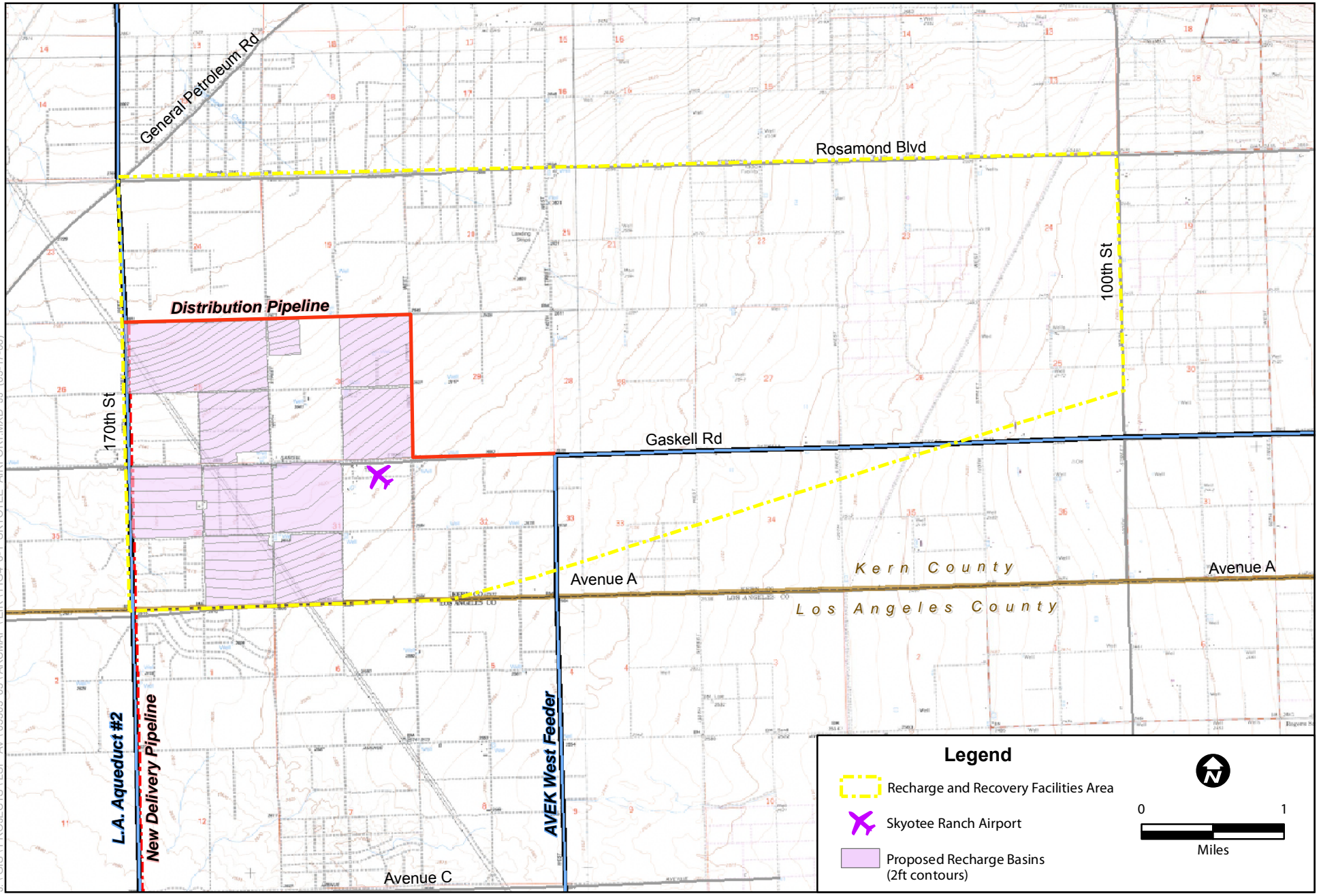
Skyotee Ranch Airstrip was originally a legal nonconforming crop dusting airstrip. A Conditional Use Permit (CUP No. 16, Map 232) was approved on December 10, 1992 to allow for the use of the property as a private airstrip. It is 2,640 feet long by 100 feet wide, allowing for single and some multi-engine aircraft to utilize the facility. The airport is intended for use by surrounding property owners and their guests.

## **Mosquito-Borne Diseases**

In addition to becoming a nuisance, mosquitoes can act as potential disease-carrying vectors. All species of mosquitoes require standing water to complete their growth cycle; therefore, any standing body of water represents a potential mosquito breeding habitat. Although mosquitoes will typically stay close to suitable breeding habitat and blood-meal hosts, they are known to travel up to 10 miles under breezy conditions.

The breeding period for mosquitoes depends on temperature but generally occurs March through October. Water quality also affects mosquito reproduction. Generally, poor-quality water (e.g., water with limited circulation, high temperature, and high organic content) produces greater numbers of mosquitoes than high-quality water (e.g., water with high circulation, low temperature, and low organic content) (Collins and Resh 1989). In addition, irrigation and flooding practices may influence the level of mosquito production associated with a water body. Typically, water bodies with water levels that slowly increase or recede produce greater numbers of mosquitoes than water bodies with water levels that are stable or that rapidly fluctuate.

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**Figure 4.6-1**  
**Skyotee Ranch Airport Location**

Mosquito-related impact mechanisms include habitat-type conversions and changes in open-water acreage and water management practices related to Project operation. The creation, removal, and/or management of habitat types, including irrigated agriculture, could increase or decrease the amount of potential breeding habitat for mosquitoes. Management and design of recharge basins could substantially affect mosquitoes' breeding success.

### **Mosquito Species of Concern**

In Kern County, two species of mosquito are primary targets for suppression (O'Rullian pers. comm.). These two species, *Culex pipiens quinquefaciatus* and *Culex tarsalis*, are potential vectors of encephalitis and West Nile Virus. Other species of mosquitoes exist in Kern County that can cause a substantial nuisance in surrounding communities, but the *Culex* mosquito is the primary vector species of concern.

Although the West Nile Virus can be transmitted by a number of mosquito species, *Culex* is the most common carrier. This disease is thought to be a seasonal epidemic that flares up in the summer and fall. West Nile Virus is spread when mosquitoes that feed on infected birds bite humans and other animals (U.S. Department of Health and Human Services 2005).

The encephalitis mosquito (*Culex tarsalis*) breeds in almost any freshwater pond. Birds appear to be the primary blood-meal hosts of this species, but the insect will also feed on domestic animals and humans (Bohart and Washino 1978). This species is the primary carrier in California of western equine encephalitis, St. Louis encephalitis, and California encephalitis, and is considered a significant disease vector of concern in the state.

The house mosquito (*Culex pipiens quinquefaciatus*) usually breeds in waters with a high organic material content. This species is often identified by its characteristic buzzing. Although the primary blood-meal host is birds, the house mosquito also can seek out humans. The house mosquito can be a vector of St. Louis encephalitis.

### **Mosquito Concerns at the Project Site**

Potential mosquito breeding sites in the Project area include agricultural ditches, tail water ponds and canals, as well as irrigated cropland.

The warmer months are typical mosquito problem periods. Mosquitoes begin reproducing in March, and their reproduction usually peaks in September. Reproduction rates diminish in the cooler winter months, but adults may overwinter in the area.

### **Mosquito Control and Abatement Districts**

Project features such as the recharge basins could provide potential breeding sites for mosquitoes. There are no established Mosquito Abatement Districts that currently serve the area proposed for the recharge basins.

## Valley Fever

Coccidioidomycosis, commonly known as Valley Fever, is primarily a disease of the lungs that is common in the southwestern United States and northwestern Mexico. The disease is of critical concern to Kern County. Valley Fever is caused by the fungus *Coccidioides immitis*, which grows in soils in areas of low rainfall, high summer temperatures, and moderate winter temperatures. These fungal spores become airborne when the soil is disturbed by winds, construction, farming, and other activities. In susceptible people and animals, infection occurs when a spore is inhaled. Valley Fever symptoms generally occur within 3 weeks of exposure. Valley Fever is not a contagious disease. Secondary infections are rare.

It is estimated that more than 4 million people live in areas where Valley Fever fungus is prevalent in the soils. Residents of Bakersfield and Phoenix, Arizona, have shown positive skin-test reaction rates of 30–40 percent, meaning that about one-third of residents tested have had Valley Fever sometime in the past. Among those who have never had Valley Fever, the chance of infection is about 3 percent per year, but the longer one resides in an endemic area, the greater the risk. In the southwestern U.S., there are approximately 100,000 new infections each year.

People working in certain occupations such as construction, agriculture, and archaeology have an increased risk of exposure and disease because these jobs result in the disturbance of soils where fungal spores are found. Valley Fever infection is highest in California from June to November. In addition, many domestic and native animals are susceptible to the disease, including dogs, horses, cattle, coyotes, rodents, bats, and snakes. Most Valley Fever cases are very mild. It is estimated that 60 percent or more of infected people either have no symptoms or experience flu-like symptoms and never seek medical attention.

## Regulatory Framework

### Federal Regulations

The principal federal regulatory agency responsible for the safe use and handling of hazardous materials is the EPA. Two key federal regulations pertaining to hazardous wastes are described below. Other applicable federal regulations are contained primarily in CFR Titles 29, 40, and 49.

### Resource Conservation and Recovery Act

The federal Resource Conservation and Recovery Act enables the EPA to administer a regulatory program that extends from the manufacture of hazardous materials to their disposal, thus regulating the generation, transportation, treatment, storage, and disposal of hazardous waste at all facilities and sites in the nation.

### **Comprehensive Environmental Response, Compensation, and Liability Act**

The Comprehensive Environmental Response, Compensation, and Liability Act (also known as Superfund) was passed to facilitate the cleanup of the nation's toxic waste sites. In 1986, the act was amended by the Superfund Amendment and Reauthorization Act Title III (community right-to-know laws). Title III states that past and present owners of land contaminated with hazardous substances can be held liable for the entire cost of the cleanup, even if the material was dumped illegally when the property was under different ownership.

### **State Regulations**

California regulations are equal to or more stringent than federal regulations. The EPA has granted the State of California primary oversight responsibility to administer and enforce hazardous waste management programs. State regulations require planning and management to ensure that hazardous wastes are handled, stored, and disposed of properly to reduce risks to human and environmental health. Several key laws pertaining to hazardous wastes are discussed below.

### **Hazardous Materials Release Response Plans and Inventory Act of 1985**

The Hazardous Materials Release Response Plans and Inventory Act, also known as the Business Plan Act, requires businesses using hazardous materials to prepare a plan that describes their facilities, inventories, emergency response plans, and training programs. *Hazardous materials* are defined as unsafe raw or unused materials that are part of a process or manufacturing step. They are not considered hazardous waste. Health concerns pertaining to the release of hazardous materials, however, are similar to those relating to hazardous waste.

### **Hazardous Waste Control Act**

The Hazardous Waste Control Act created the state hazardous waste management program, which is similar to but more stringent than the federal Resource Conservation and Recovery Act program. The act is implemented by regulations contained in Title 26 of the CCR, which describes the following required aspects for the proper management of hazardous waste:

- identification and classification;
- generation and transportation;
- design and permitting of recycling, treatment, storage, and disposal facilities;
- treatment standards;
- operation of facilities and staff training; and
- closure of facilities and liability requirements.

These regulations list more than 800 materials that may be hazardous and establish criteria for identifying, packaging, and disposing of such waste. Under

the Hazardous Waste Control Act and Title 26, the generator of hazardous waste must complete a manifest that accompanies the waste from generator to transporter to the ultimate disposal location. Copies of the manifest must be filed with the California Department of Toxic Substances and Control.

### **Unified Hazardous Waste and Hazardous Materials Management Regulatory Program**

Senate Bill 1082, introduced by Senator Charles Calderon (D-Whittier) and passed in 1993, created the Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program), which requires the administrative consolidation of six hazardous materials and waste programs (Program Elements) under one agency, a Certified Unified Program Agency (CUPA). The Program Elements consolidated under the Unified Program are:

- Hazardous Waste Generator and On-site Hazardous Waste Treatment Programs (a.k.a., Tiered Permitting),
- Aboveground Petroleum Storage Tank Spill Prevention Control and Countermeasure Plan (SPCC),
- Hazardous Materials Release Response Plans and Inventory Program (a.k.a., Hazardous Materials Disclosure or “Community-Right-To-Know”),
- California Accidental Release Prevention Program (Cal ARP),
- UST Program, and
- Uniform Fire Code Plans and Inventory Requirements.

The Unified Program is intended to provide relief to businesses complying with the overlapping and sometimes conflicting requirements of formerly independently managed programs. The Unified Program is implemented at the local government level by CUPAs. Most CUPAs have been established as a function of a local environmental health or fire department. Some CUPAs have contractual agreements with another local agency, a *participating agency*, that implements one or more Program Elements in coordination with the CUPA.

## **Local Regulations**

On a local or regional scale, the county Environmental Health Department handles and manages many local hazardous materials concerns. Many of the programs mentioned previously are delegated to local authorities such as the county Environmental Health Department; emergency response is often delegated to local fire districts.

### **Kern County General Plan**

The Kern County General Plan, adopted June 15, 2004, contains the following policies.

#### ***Safety Element***

*Wildland and Urban Fire*

**■ Policies**

- ❑ Require discretionary projects to assess impacts on emergency services and facilities.
- ❑ All discretionary projects shall comply with the adopted Fire Code and the requirements of the Fire Department.

**■ Implementation Measures**

- ❑ Require that all development comply with the requirements of the Kern County Fire Department or other appropriate agency regarding access, fire flows, and fire protection facilities.

**Kern County Airport Land Use Compatibility Plan (ALUCP)**

The Project is located within Kern County, which has developed an ALUCP that addresses land use compatibility for 16 public use airports, two military installations (China Lake Naval Weapons Station and Edwards Air Force Base), and the Joint Service R-2508 Airspace complex. The ALUCP identifies an airport influence area for each airport and policies that apply to military aviation and the military installations. Proposed development projects within these areas must be reviewed to determine their potential to affect the airport. If a project is proposed by the airport, the project should be reviewed for its potential to affect adjacent non-airport land within the airport influence area.

**Mosquito Abatement and Vector Control**

Project features that may provide potential breeding sites for mosquitoes only occur in Kern County. The eastern portion of Kern County is not currently located within a Mosquito Abatement District. In the past, the Antelope Valley Mosquito Abatement District (AVMAD) in Los Angeles County, located south of the recharge basins, has contracted with Kern County to treat sumps in Rosamond. AVMAD is willing to have the Project included in their District through annexation or a contractual relationship (Kratz pers. comm.)

Typical means of control are discussed below.

***Environmental Control***

A Mosquito Abatement District's preferred method of treatment is elimination or reduction of the source, including physical elimination of environmental conditions necessary for mosquito production. This method typically involves eliminating sources of standing water.

***Biological Control***

Mosquitofish are the primary biological control used by the Mosquito Abatement Districts. Mosquitofish are raised in captivity and used to stock open waters and flooded habitats where mosquito larvae may most likely be found. The effectiveness of mosquitofish can be limited by dense stands of emergent wetland vegetation, and management of these stands is often a required element of an integrated mosquito abatement program.

**Pesticides**

Pesticides are used by Mosquito Abatement Districts to control larval and adult mosquitoes. Larvicides, such as light-grade oils and *Bacillus thuringiensis israelensis*, a bacterial larvicide, are applied directly to water to control mosquito larvae. For adult mosquito suppression, and as a last resort, Mosquito Abatement Districts will use synthetic pyrethroids, a group of synthetic insecticides with relatively low mammalian toxicity that are modeled after the botanical pyrethrum insecticides (Amdur et al. 1991, O'Rullian pers. comm.).

**Willow Springs Specific Plan**

A relevant policy from the WSSP is provided below.

**Seismic and Safety Element****■ Goal**

- To promote a safe and healthful living environment.
- Protect human life and health.

**■ Policies**

- Sensitive and highly sensitive land uses should be minimized within the area subject to overflights from Edwards Air Force Base.

**Public Facilities Element****■ Mitigation/Implementation Measures**

- The projects shall comply with all applicable Kern County Code and ordinance requirements for construction, access, water mains, fire flows, and fire hydrants.

**Los Angeles County General Plan**

A relevant goal and relevant policies from the general plan are provided below.

**Safety Element/Hazardous Materials****■ Goal**

- Reduce threats to public health and safety from hazardous materials, especially threats induced by earthquakes.

**■ Policies**

- Review proposed development projects involving the use or storage of hazardous materials, and disapprove proposals which cannot properly mitigate unacceptable threats to public health and safety to the satisfaction of responsible agencies.
- Promote the safe transportation of hazardous materials.

**County of Los Angeles Fire Department Hazardous Waste Program**

The Health and Hazardous Materials Division of the county Fire Department administers the Hazardous Waste Programs component of the Unified Program throughout the county.



### **Antelope Areawide General Plan**

A relevant policy from this general plan is provided below.

#### ***Environmental Resource Management/Hazardous Areas***

##### **■ Policy**

- Support programs to reduce fire hazards in areas of high and extreme fire risk.

## **Impact Analysis**

This section describes the CEQA impact analysis relating to hazards and public health issues for the proposed Project. It describes the methods used to determine the proposed Project's impacts and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion.

## **Methodology**

The evaluation of potential impacts on public health and environmental hazards addresses the potential for health and safety hazards during Project construction and operation of Project facilities after construction. The analysis includes potential effects on airport safety and military operations related to operation and construction activities, an assessment of Project features that might be conducive to mosquito breeding and propagation, as well as general facility safety and hazards to the public posed by the new facilities and their operation. Mosquito breeding conditions and abatement requirements were evaluated based on mosquito ecology and control literature, communication with the Mosquito Abatement District staff at Kern County Mosquito and Vector Control and at Kern County Environmental Health Services, and on Project design and operational management specifications.

## **Thresholds of Significance**

The Kern County CEQA Implementation Document and Kern County Environmental Checklist state that a project would have a significant impact on hazards and hazardous materials, if it would:

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

- emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 1/4 mile of an existing or proposed school.
- 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 create a significant hazard to the public or the environment.
- for a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, result in a safety hazard for people residing or working in the project area.
- for a project within the vicinity of a private airstrip, result in a safety hazard for people residing or working in the project area.
- impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan.
- expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.
- generate vectors (flies, mosquitoes, rodents, etc.) or have a component that includes agricultural waste. Specifically, exceed the following qualitative threshold:
  - occur as immature stages and adults in numbers considerably in excess of those found in the surrounding environment; and
  - are associated with design, layout, and management of project operations; and
  - disseminate widely from the property; and
- cause detrimental effects on the public health or well being of the majority of the surrounding population.

## Impacts and Mitigation Measures

### Impact 4.6-1: Potential for Disturbance of Hazardous Materials or Wastes during Construction

The environmental database review conducted in July 2005 by Environmental Data Resources Inc. (EDR), revealed no potential hazardous waste sites on the parcels proposed for the recharge basins. Analyses of groundwater samples revealed no indications of contamination. The Project will not locate recovery pipelines and wells on or within 1 mile of known hazardous waste sites. Therefore, disturbance of hazardous materials or wastes is not anticipated as a result of the Project.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significant after Mitigation:** No Impact.

### **Impact 4.6-2: Potential for Inadvertent Release of Hazardous Materials during Construction and Operation**

During construction of the Project facilities, hazardous materials such as fuels and lubricants would be used to operate construction equipment and vehicles such as excavators, compactors, haul trucks, and loaders. In addition, operating and maintaining the pumps may include the use of fuels, lubricants, and other hazardous materials. Fuels and lubricants have the potential to be released into the environment at the Project site and along haul routes, causing environmental and/or human exposure to these hazards. The Project site has been used continuously for farming operations and contains soil amendments that make valley fever unlikely. Grading operations are of short duration and impacts on grading operators and surrounding scattered residences will be limited.

#### **Mitigation Measure**

***Mitigation Measure 4.6-1:*** Prior to any construction activities, the applicant shall develop and implement a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities for all contractors. The plan and methods shall be in conformance with all state and federal water quality regulations.

The applicable agency, Kern County Environmental Health Services Department and Los Angeles County Environmental Health Services, shall review the SPCCP before the onset of construction activities. The applicant shall provide for routine inspection of the construction area to verify that the measures specified in the SPCCP are properly implemented and maintained and further ensure that contractors are notified immediately if there is a noncompliance issue and will require compliance.

The federal reportable spill quantity for petroleum products, as defined in EPA's CFR (40 CFR 110), is any oil spill that 1) violates applicable water quality standards, 2) causes a film or sheen upon or discoloration of the water surface or adjoining shoreline, or 3) causes a sludge or emulsion to be deposited beneath the surface of the water or adjoining shorelines.

If a spill is reportable, the contractor's superintendent shall notify the applicant who shall inform the applicable County agency and arrange for the appropriate safety and cleanup crews to ensure the spill prevention plan is followed. A written description of reportable releases must be submitted to the Regional Water Quality Control Board and the applicable County agencies. This submittal must include a description of the release, including the type of material and an estimate of the amount spilled, the date of the release, an explanation of why the

spill occurred, and a description of the steps taken to prevent and control future releases. The releases would be documented on a spill report form.

If a spill has occurred, the applicant shall coordinate with responsible regulatory agencies to implement measures to control and abate contamination.

**Level of Significance after Mitigation:** Less than significant.

### **Impact 4.6-3: Potential to Increase the Risk of Wildlife Strikes to Aircraft**

Bird and other wildlife strikes to aircraft have caused over \$600 million in damage to U.S. civil and military aviation annually. Furthermore, these strikes can cause risks to the lives of aircraft crew members, passengers, and those on the ground. Birds can penetrate aircraft windshields and fuselages and can be ingested into engines to cause fires and malfunctions. (Bird Strike Committee USA 2005.)

The discussion below focuses on Edwards Air Force Base because the bird aircraft strike hazard has been assessed extensively for corridors under their jurisdiction over the recharge facility. This potential impact would also be a concern for the Skyotee Ranch Airport because of its proximity to the recharge basins.

During preparation of this document, the U.S. Air Force and U.S. Navy were consulted regarding their specific bird aircraft strike hazard concerns (Jeglum pers. comm., Deakin pers. comm., Parisi pers. comm., Hagan pers. comm., Dyas pers. comm., Griese pers. comm.). The U.S. military seeks to reduce wildlife strike hazards by providing guidance on facility development and habitat management, and the Air Force's BASH Team was established with the specific goal of preserving its war fighting capabilities through the reduction of wildlife hazards to aircraft operations.

Such consultation complies with Kern County's ALUCP, Policy 1.7.1(c), which states that:

Prior to the approval of a proposal involving any type of land use development as stated in section 10.3.3.3, specific findings shall be made that such development is compatible with the training and operational missions of the military aviation installations. Incompatible land uses that result in significant impacts to the military mission of Department of Defense installations or to the Joint Service Restricted R-2058 Complex that cannot be mitigated, shall not be considered consistent with this plan.

Available data pertaining to Edwards Air Force Base were reviewed to identify existing bird species that pose threats to military aircraft. Data for Edwards Air Force Base were reviewed because the site is the military facility nearest to the proposed Project. Avian species such as ravens, starlings, sparrows, and blackbirds were identified as posing hazards to aircraft generally at altitudes of

less than 500 feet. Species such as hawks and eagles were identified as posing hazards generally at altitudes to 1,000 feet, and vultures and buzzards were identified as posing hazards generally to altitudes of 2,000 feet, though they are capable of flying at much greater altitudes (U.S. Air Force 2003).

Because Edwards Air Force Base is located along the Pacific Flyway, birds are of greatest concern during the fall and spring migration seasons, when the hazard is considered moderate. Edwards Air Force Base includes portions of Rosamond Dry Lake (21 square miles) and Rogers Dry Lake (44 square miles), which, during wet years, retain water for many months. These features, as well as sewage evaporation ponds, can attract birds to Edwards Air Force Base (U.S. Air Force 2003).

The Project is located approximately 17 miles west of Edwards Air Force Base and, therefore, would not directly affect aircraft approaches or departures. However, most bird strikes to Air Force aircraft occur during the low-level cruise phase of flight (U.S. Air Force 2005). The low-level flight paths in Project area may be used only infrequently, but the paths are flown at least annually to confirm that they are free of obstructions, and use of the low-level flights paths can occur at any time of year (Griese pers. comm.)

The proposed Project has the potential to create up to approximately 1,500 acres of open water in an otherwise arid environment, and could attract the types of birds identified as posing hazards at Edwards Air Force Base. It is important, however, to note that the Project would not create permanent water bodies. It is expected that, on average, imported surface water would be available for application to the recharge basins in three out of 10 years. In most years when water is available, active recharge could be completed in less than 60 days. In unusual years, recharge could occur over several months. When not used for recharge purposes, the basins would be used for organic farming a minimum of 8 months of the year.

Several factors that have been incorporated into the design of the Project will discourage bird attraction, including:

- highly permeable soils that minimize the area required for recharge and the duration of recharge events,
- steep-sloped basins that provide sharp edges between different landscape types, and
- removal of vegetation that would otherwise provide loafing, foraging, or nesting habitat.

Additionally, operational factors will discourage bird attraction, including:

- minimizing the area used for recharge (this consideration minimizes disruption of agricultural operations and minimizes evaporative losses as well) and

- avoidance of crops that would otherwise support birds such as fruit, nuts, seeds, and grains.

In light of the above factors, the recharge basins will lack many of the characteristics (e.g., nesting and foraging habitat) that would otherwise make them attractive to birds. Additionally, according to the Air Space Management Office at Edwards Air Force Base, increased water flows to Harper Dry Lake, located southeast of Edwards Air Force Base and within the R-2508 Air Complex, have not resulted in a reported increase in bird hazards (Griese pers. comm.). Nonetheless, it is possible that birds will use the recharge basins. If the recharge basins attract birds, the birds could become hazard to aircraft. This potential impact is significant because it could result in a safety hazard for people residing or working in the Project area.

### **Mitigation Measures**

***Mitigation Measure 4.6-2:*** Prior to application of water to the recharge basins, the Project operator will notify Skyotee Ranch Airport and the Flight Safety Office for the R-2508 Air Complex of anticipated recharge operations.

**Level of Significance after Mitigation:** Less than significant.

***Mitigation Measure 4.6-3:*** Whenever water is present in the recharge basins, the Project operator will monitor the basins for bird activity. Monitoring will be particularly important during initial application of water because prey animals fleeing the advancing water could attract predatory bird species. Additionally, the Project operator will maintain routine coordination with the local Audubon Society chapters in Bakersfield and Ridgecrest regarding when and where bird migration activity should be expected during periods of recharge activity.

If large birds (e.g., geese, gulls, pelicans) or large flocks of small birds (e.g., starlings, blackbirds) are observed, the Skyotee Ranch Airport and the Flight Safety Office for the R-2508 Air Complex will be notified of the potential hazard immediately.

**Level of Significance after Mitigation:** Less than significant.

***Mitigation Measure 4.6-4:*** If flocks of large birds (e.g., geese, gulls, pelicans) or large flocks of small birds (e.g., starlings, blackbirds) are observed, the applicant or the Project operator will harass the birds through legal means to discourage use of the recharge basins, such as use of pyrotechnic equipment or depredation permitted by the California Department of Fish and Game (DFG).

**Level of Significance after Mitigation:** Less than significant.

#### **Impact 4.6-4: Potential for Increase in Adult Mosquito Populations**

Open-water areas are potential breeding areas for mosquitoes. Up to 1,500 acres of recharge basins would be flooded to an average depth of 1 to 2 feet and a maximum depth of 4 feet. The basins would have berms with 1:1.5 to 1:2 vertical-to-horizontal slopes. The proposed operational strategy offers some insight into the significance of these potential breeding habitats.

Months of operation would vary. When not used for recharge, the basins would be used for organic agriculture. After recharge periods, the soil would be tilled and cleared for crops of a similar type to the current crops. The same kind of operation would occur after the growing season in preparation for the recharge period. Recharge basins would typically cover 160 acres, subdivided into checks averaging 20 acres. With depths of up to 4 feet, available fetch over the surface of the individual cells would most likely generate wave action that would suppress development of mosquito larvae. Waves can disrupt the ability of mosquito larvae to penetrate the surface of water and take flight, thus effectively suppressing the population. Additionally, water levels will likely vary several feet every few days as operations are adjusted.

During pilot testing of recharge on the property, the applicant has observed that water percolates quickly. Thus, it is expected that mosquito production would be inhibited because, during application, water will be flowing through the recharge basins and generally will not persist after flows cease.

Emergent vegetation is a critical element of mosquito breeding habitat because the vegetation is used as a structure to place eggs and/or cover larvae. Emergent vegetation would be eliminated from the recharge basins during recharge periods whenever possible to further reduce the likelihood of mosquito production.

The Project design and proposed operational strategy would suggest limited mosquito production; however, varying mosquito ecology precludes a quantitative analysis of net mosquito production that would result from the Project. It is conceivable that a net increase in mosquito production and a resultant net increase in mosquito abatement could occur under specific sets of circumstances.

#### **Mitigation Measure**

***Mitigation Measure 4.6-5:*** Prior to the issuance of a grading permit, the applicant shall enter into an agreement with an existing or new Mosquito Abatement District. The agreement will consist of a Project-specific mosquito abatement program that would allow the existing or new Mosquito Abatement District to access the Project site and would also include quantitative abatement thresholds and financial compensation requirements for Mosquito Abatement District activities, if necessary. The agreement shall be to the satisfaction of the Kern County Environmental Health Services Department.

The Mosquito Abatement District would monitor mosquito larvae production in the recharge basins, drainages, and distribution. Larvae populations would be tracked using methods and thresholds approved by the Mosquito Abatement District, and suppression measures would be employed when thresholds are exceeded.

**Level of Significance after Mitigation:** Less than significant.

## Cumulative Impact

Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The cumulative impact scenario for the Project includes seven specific projects identified by Kern and Los Angeles Counties, and buildout of the Kern County General Plan. A detailed description of the cumulative impact scenario considered with the proposed Project is provided in Chapter 3, "Project Description," and the project list is presented below.

A cumulative impact analysis first identifies whether a cumulatively significant impact exists in the given resource area. If so, it determines whether the project will make a considerable contribution to that impact. Where a cumulative impact is severe, even a small contribution may be considerable (Section 15130(b) of the State CEQA Guidelines).



**Table 4.6-1.** Relevant Cumulative Projects

Case Number (if applicable)	Project Name	Project Location	Approximate Distance to Project Site	Project Type	Project Description
<b>Kern County</b>					
GPA 1, Map 218	Tejon Mountain Village Specific Plan	East of I-5 in the hills north and east of Castaic Lake	14 miles northwest of project site	Major Residential/commercial/recreational development	3,450 single family units (s.f.u.) homes on 23,000-acre planning area,
GPA, Map 255	Lebec Canyon Estates	East of Frazier Mountain Park Road/I-5 interchange	22 miles west of project site	Residential development	32 s.f.u on 1,000 acres
SPA 8, Map 254, Amend. Zone Map 254, Zone Change 6, SP 1, Map 254, Vesting Tent. Tract 6436	Frazier Park Estates	Southern boundary of Kern Co. and portion of LA County, west of I-5 south of Frazier Mountain Park Road	24 miles west of project site	Residential / Commercial development	705 s.f.u. and 135 thousand sq. ft of commercial on 847 acres in Kern County and 323 in LA County
GPA to 5.7, Map 215	Christine Bower	One quarter mile west of 105 <sup>th</sup> Street and McConnell Road near Rosamond	3 miles north of project site	General Plan Amendment and Zone	4 s.f.u on 20-acre site
ZC to A-1, Map 231	Julien and Assoc.	8684 Sweetser Road, Rosamond (APN 315-081-09)	3-1/2 miles northeast of project site	Commercial greenhouses	60-acre site
<b>Los Angeles County</b>					
N/A	Centennial Specific Plan	1 mile east of I-5, adjacent to SR-138	12 miles southwest of project site	Large-scale new community; including residential/commercial development	23,000 dwelling units and 14 million sq. ft. commercial on 11,700 acres
N/A	Gorman Ranch	Gorman Post Road, north of SR-138, east of I-5	17 miles southeast of project site	Residential	227 s.f.u. on 2,500 acres

## **Kern County General Plan and Relevant Projects**

The Kern County General Plan EIR did not identify significant and unavoidable impacts associated with hazards or hazardous materials. The Kern County General Plan EIR found that implementation of applicable goals, policies and regulations would reduce potential impacts to less-than-significant levels.

### **Hazardous Materials**

The Tejon Mountain Village, Level Canyon Estates, Frazier Park Estates, Centennial, and Gorman Ranch projects would occur on currently and previously undeveloped land; therefore, risks associated with upset of unknown buried hazardous materials would be minimal. As stated in Hazards and Hazardous Materials Impact 4.6-1, no hazardous material records were identified for the proposed Project site.

While Impact 4.6-2 identifies the potential for inadvertent release of materials during construction or operation, impacts related to hazardous materials are generally site-specific, and effects are usually limited to the immediate surrounding area. These effects would not be expected to contribute considerably to a release associated with any of the other projects considered under the cumulative scenario.

### **Bird Aircraft Strike Hazards**

Edwards Air Force Base has identified existing surface water bodies in Antelope Valley as bird aircraft strike hazards (BASH). Specifically, wastewater treatment ponds, Rogers Dry Lake Bed, and Rosamond Dry Lake Bed are identified as sources of the hazard. The current situation is described as a low-to-moderate hazard (United States Air Force 2003). Other projects considered under the cumulative scenario also could include open water bodies (such as those associated with golf courses, water storage, and wastewater treatment) that could attract birds. The current BASH, in the absence of the proposed Project, is considered a significant cumulative impact.

### **Mitigation Measures**

The Project has been designed and would be operated in such a fashion as to discourage attracting birds. Mitigation Measure 4.6-4 (discourage bird activity during recharge operations) would further discourage use of the recharge basins by birds. Implementation of Mitigation Measure 4.6-2 (notify Skyotee Ranch Airport and the Flight Safety Office for the R-2508 Air Complex of anticipated recharge operations) and Mitigation Measure 4.6-3 (monitor bird activity during recharge operations) would ensure that potential hazards are identified and brought to the attention of the Flight Safety Office.

### **Mosquito Production**

The potential for increases in mosquito production as a result of changes in land use, such as construction of golf courses, is a significant cumulative impact. The Project could result in a net increase in mosquito production. Other projects considered under the cumulative scenario also could include open water bodies

(such as those associated with golf courses, water storage, and wastewater treatment) that could provide breeding habitat for mosquitoes. As such the proposed Project could contribute considerably to potential health hazards associated with mosquitoes.

**Mitigation Measures**

The Project has been designed and would be operated in such a fashion as to discourage mosquito production. Nonetheless, as described above, the applicant shall implement Mitigation Measure 4.6-5 and enter into an agreement with a Mosquito Abatement District.

**Level of Significance after Mitigation:** Cumulative impacts would be less than significant.

## 4.7 Hydrology and Water Quality

### Introduction

This section describes the environmental setting for hydrology and water quality, the impacts on hydrology and water quality that could result from the Project, and any necessary mitigation measures that would reduce significant impacts.

The Project would store imported State Water Project (SWP) surface water from the Delta in the Neenach Sub-Basin of the west end of the Antelope Valley. Project participants, who have existing entitlements to available SWP water, would provide the water in accordance with authorized SWP operations. There would be no additional entitlements sought for this Project. The main focus of this Project is to enhance water supply reliability and flexibility through the storage of existing water allocations by Project participants in accordance with authorized SWP operations. Authorized SWP operations would not change due to the Project. Up to 90 percent of the stored water would be recovered for use when needed.

### Environmental Setting

This section discusses the existing conditions related to surface and groundwater hydrology and water quality in the Project area. Federal, state, and local regulations related to hydrology and water quality that would apply to the Project are discussed under Regulatory Framework.

### Existing Conditions

#### Surface Water

Antelope Valley is semiarid, averaging less than 10 inches of rain per year. There are no perennial streams in the area proposed for the recharge and recovery facilities, with the closest feature being the terminus of the distributary channel of ephemeral Cottonwood Creek 1 mile north, as indicated on Figure 4.7-1. There are three unnamed ephemeral drainages along the proposed alignment of the Phase 2 delivery pipeline (Figure 4.7-2). No wetland or riparian vegetation is associated with these drainages. The ephemeral drainages are characterized by a shallow bed and bank and are isolated waters that would not qualify as waters of the United States.

Water for the Project would be provided through the East Branch of the California Aqueduct, which is 7 miles south of the area proposed for the recharge and recovery facilities. The aqueduct is a concrete-lined canal that was constructed (in this area) by California Department of Water Resources (DWR)

to carry surface water from the Bay-Delta to contractors of the SWP. In this area, the aqueduct has a capacity of 2,010 cfs. Delta exports are the primary source of water in SWP facilities and reservoirs south of the Delta. Much of the SWP water is exported south during the winter and spring when the greatest freshwater outflow occurs; as a result, reservoirs south of the Delta are usually supplied with high quality water. San Luis Reservoir, the only SWP storage facility between the Delta and southern California, is usually filled by May 1.

The area proposed for recharge and recovery facilities is located within the service area of the Antelope Valley East Kern Water Agency (AVEK). In the area of the Project, SWP water is provided for irrigation, municipal, and industrial uses via the AVEK West Feeder (Figures 3-1 and 3-2). For Phase 1 of this Project, water from the California Aqueduct would be conveyed to the Project through distribution lines from the AVEK West Feeder, which passes 1 mile east of the area proposed for the recharge basins. The AVEK West Feeder is a 33- to 60-inch diameter, underground, steel pipeline installed by AVEK to convey SWP water from the California Aqueduct (Turnout 20A) to Rosamond, industrial users, and farmers (Figure 4.7-3). The pipeline has a conveyance capacity of 225 cfs. There are 4.5 miles of conveyance lines that carry water from the AVEK West Feeder to the area proposed for the recharge basins.

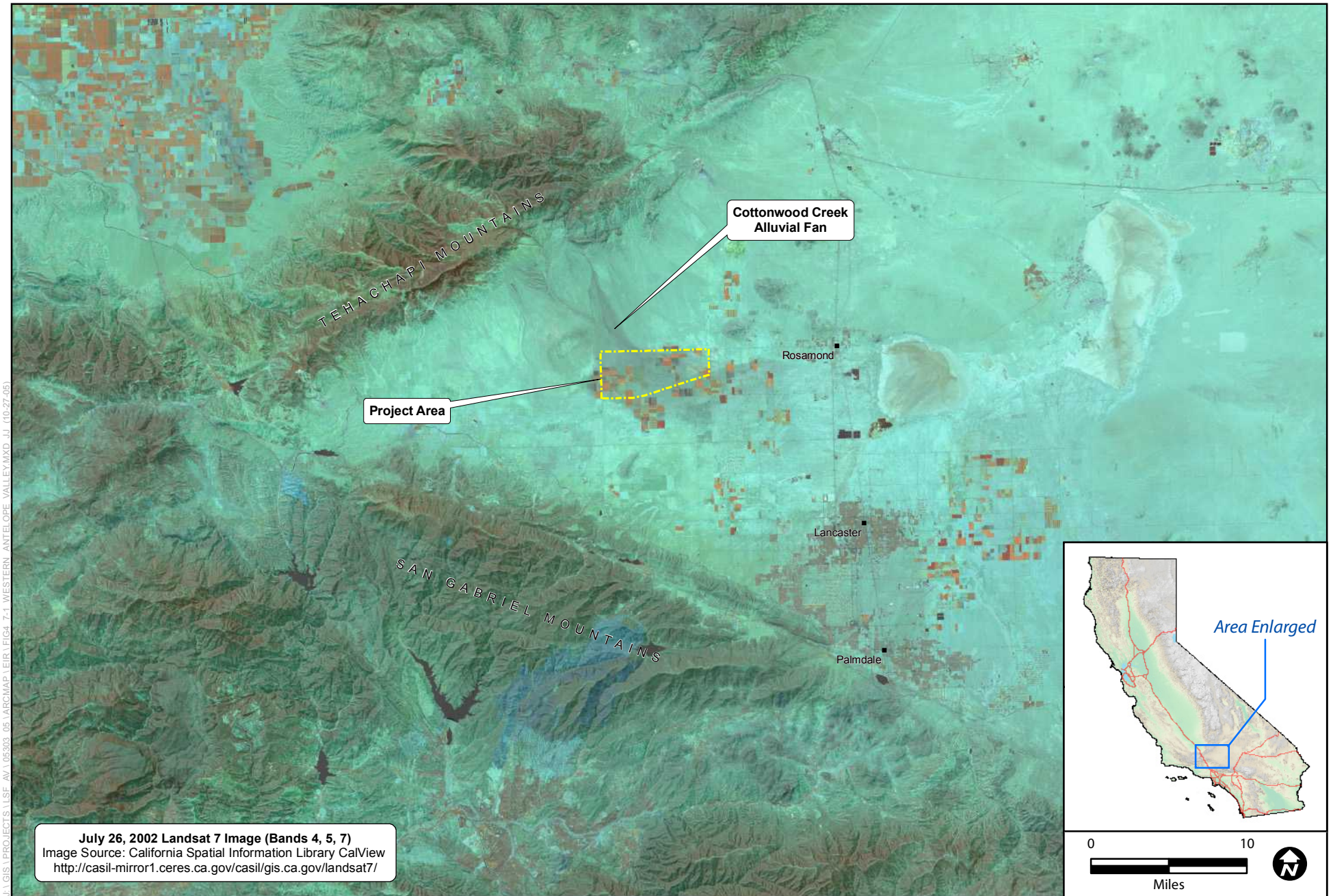
Other surface water conveyance facilities in the area include Los Angeles Aqueduct (LAA) #2 and LAA #1. LAA #2 is immediately adjacent to the west side of area proposed for the recharge basins. It is a 120-inch diameter, underground, steel pipeline installed in 1970 by the Los Angeles Department of Water and Power to convey water from the Owens Lake to Los Angeles. The pipeline typically operates less than 52 pounds per square inch and has a conveyance capacity of 290 cfs. During Phase 2, to expand recharge and recovery capacity, the owner/operator would connect the recharge and recovery facilities directly to the California Aqueduct by constructing a new delivery pipeline parallel to LAA #2 (Figures 3-1 and 3-5).

## Surface Water Quality

Surface water quality is dependent on the quality of water in the California Aqueduct because all of the surface water applied to the Project would be from the SWP. This same water has been used to irrigate the Project area since 1974.

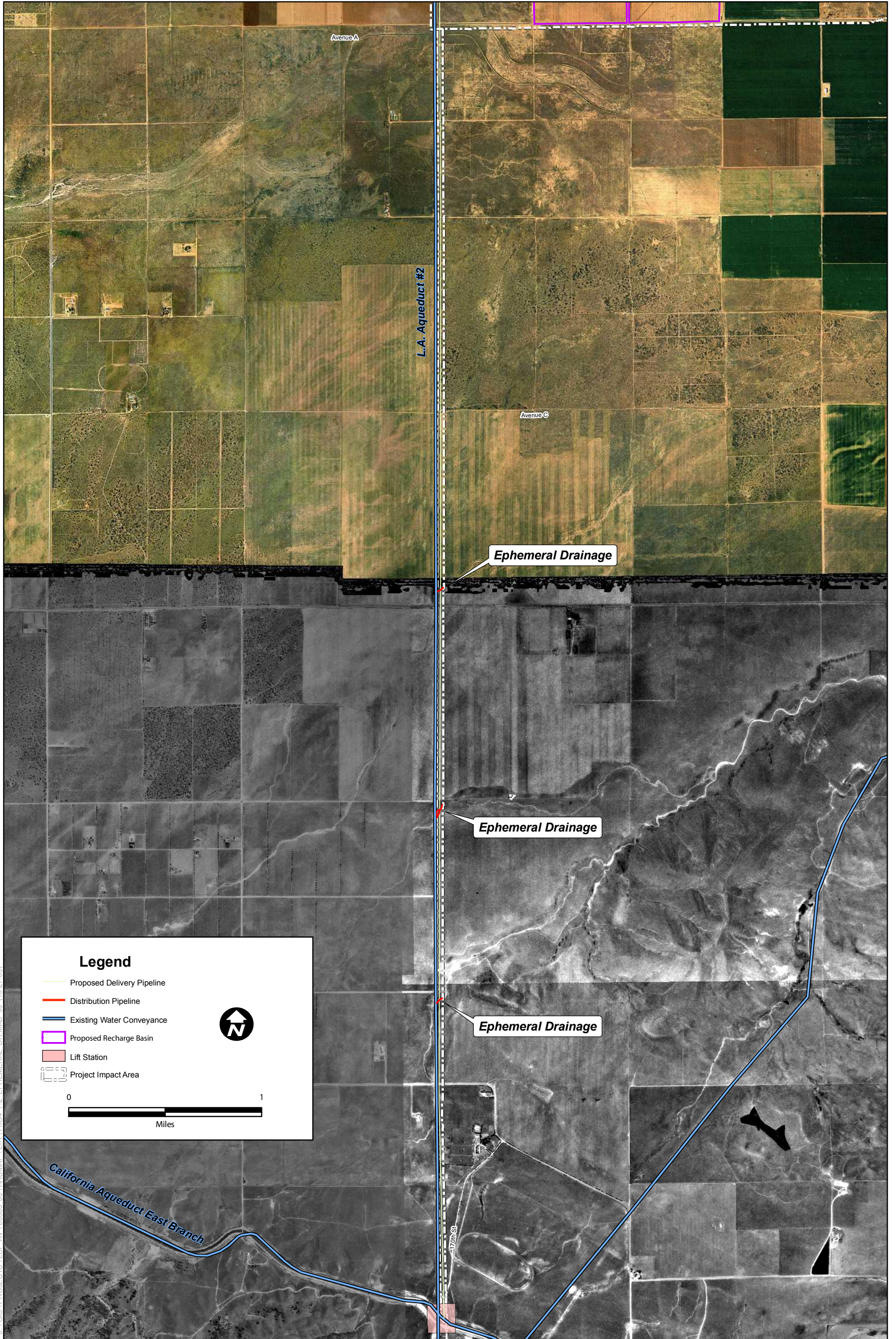
Water samples from 15 SWP stations are analyzed monthly by the DWR to determine levels of dissolved solids and concentrations of nutrients, chloride, sulfate, sodium, trace metals, and other constituents. SWP water quality data are available electronically through the DWR Internet home page ([www.water.ca.gov](http://www.water.ca.gov)) and reported monthly in the *State Water Project Operations Data Report* (<http://www.womwq.water.ca.gov/MonthlyReportsPage/index.cfm>). Yearly summaries of water quality are also available in Bulletin 132 (DWR 2004). Table 4.7-1 summarizes water quality data collected in 2002 at Check 41. Although more recent data have been collected, the 2002 data are the most current data that have been published. Check 41 is located in the Tehachapi Afterbay, approximately 18 miles upstream of AVEK's West Feeder diversion





**Figure 4.7-1**  
**Western Antelope Valley and Tehachapi and San Gabriel Mountains**

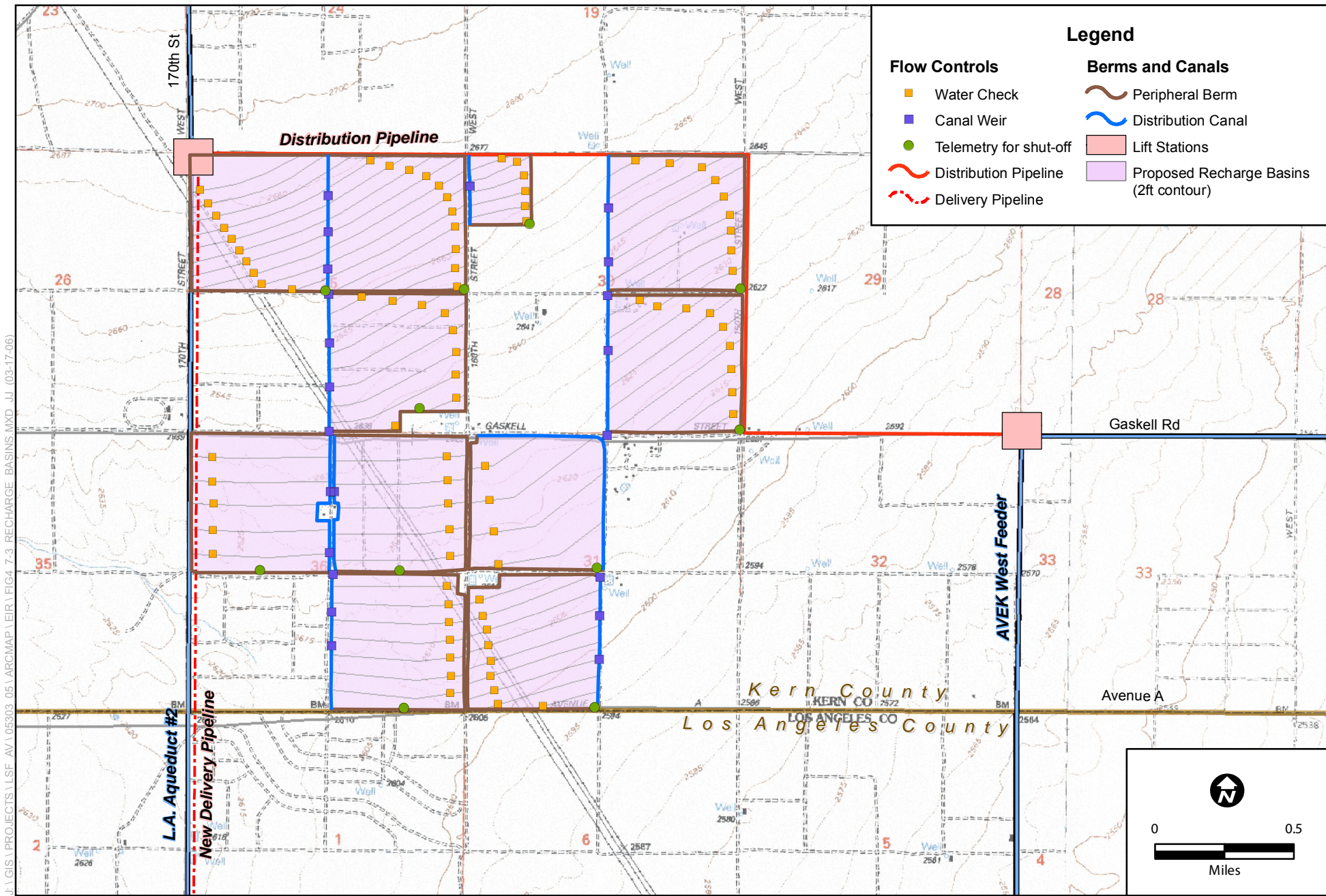




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**Figure 4.7-2**  
**Ephemeral Drainages along the Delivery Pipeline Alignment**





**Figure 4.7-3**  
**Recharge Basins**



from East Branch of the California Aqueduct. Although water is diverted from the California Aqueduct between Check 41 and the AVEK West Feeder, there are no known intentional inputs of water. (DWR 2004.)

Samples from Check 41 are analyzed for herbicides, pesticides, and other organic substances on a quarterly basis. The analyses for these constituents indicate that water quality in the aqueduct consistently meets primary drinking water quality standards. Raw data from DWR from 1988 to present at Check 41 did not indicate any detectable levels of pesticides or herbicides. As indicated in Table 4.7-1 below, SWP quality is similar to that of groundwater beneath the proposed Project area.

DWR also thoroughly reviewed the water quality information for aqueduct samples collected in 1998 and 1999 at Check 41, concluding that water quality for that time period also met primary drinking water quality standards (DWR 2000).

**Table 4.7-1. Summary of SWP and Groundwater Water Quality Data**

Analyte	Unit	SWP Check 41 (2002 Average)	Station Well (2005)	Field Well (2005)	EPA MCL	CA MCL
Alkalinity	mg/L	65	98	110		
Arsenic	mg/L	0.002	<0.002	<0.002	0.010	Pending
Boron	mg/L	<0.1	<0.1	<0.1		
Bromide	mg/L	0.10	--	--		
Calcium	mg/L	13	17	28		
Carbon-Total Organic	mg/L	3.4	<0.7	<0.7		
Chloride	mg/L	35	8.9	8.9	250 <sup>a</sup>	
Chromium	mg/L	0.001	0.016	0.010	0.100	0.050
Copper	mg/L	0.002	0.021	<0.10	1.3	1.3
Fluoride	mg/L	<0.1	0.3	0.2	4	2
Hardness	mg/L	65	52	85		
Iron mg/L	mg/L	<0.005	0.110	0.042	0.300 <sup>a</sup>	
Lead mg/L	mg/L	<0.001	<0.005	<0.005	0.015	0.002
Magnesium	mg/L	8	2	3.6		
Manganese	mg/L	<0.005	<0.005	<0.010	50 <sup>a</sup>	
Nitrate	mg/L	0.28 <sup>b</sup>	2.3	2.5	10	10-45
Phosphorus - Ortho	mg/L	0.08	--	--		
Phosphorus - Total	mg/L	0.11	<0.05	<0.05		
Selenium	mg/L	<0.001	<0.005	<0.005	0.05	0.05
Sodium	mg/L	26	36	30		

Analyte	Unit	SWP Check 41 (2002 Average)	Station Well (2005)	Field Well (2005)	EPA MCL	CA MCL
Specific Conductance	µS/cm	280	280	320		
Sulfate	mg/L	17	12	13		
Total Dissolved Solids	mg/L	170	180	210		
Turbidity	NTU	12	1.5	1.9		
Zinc	mg/L	0.015	<0.010	<0.010	5 <sup>a</sup>	

USEPA MCL = United States Environmental Protection Agency Maximum Contaminant Level for public water supplies.

CA MCL = California Maximum Contaminant Level for public water supplies.

Data sources: DWR 2004 Bulletin 132, page 49; WDS 2005 (Appendix B)

<sup>a</sup> secondary MCL

<sup>b</sup> Nitrate + nitrite value

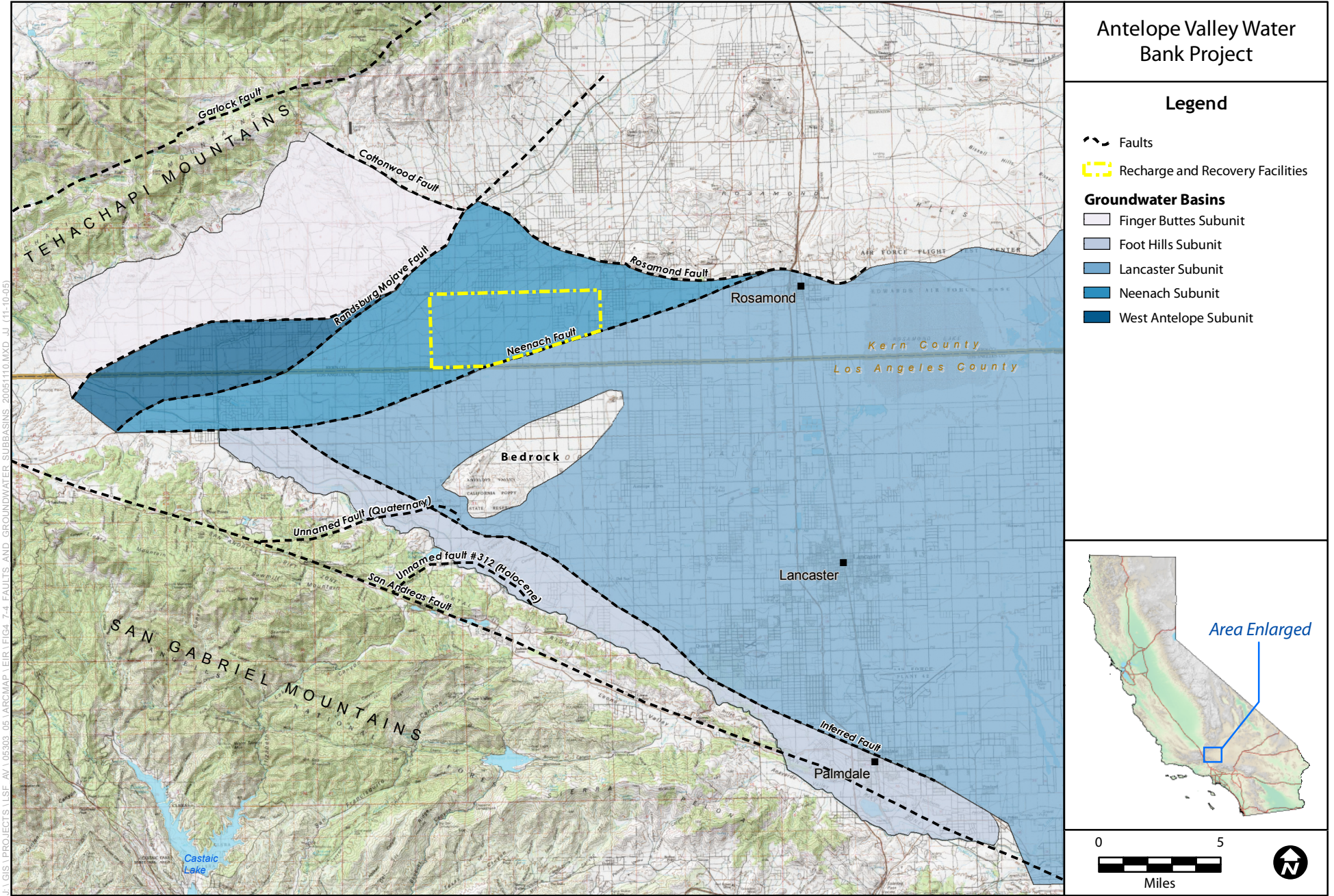
## Groundwater

The Project would store imported SWP surface water from the Delta in the Neenach Sub-Basin of the west end of the Antelope Valley in Kern County. The west end of the Antelope Valley basin is bounded by the Tehachapi Mountains on the north and the San Gabriel Mountains on the south—with these two features converging to form a triangular-shaped western terminus at the Sierra Pelona Range. The Antelope Valley is a *graben*, or an area that has dropped downward due to movement on the San Andreas and Gerlock faults that bound it. Over time, the basin has filled with several thousand feet of alluvial materials that have eroded from the bounding mountain ranges. The Antelope Valley aquifer is contained within these alluvial sands and gravels (DWR 2003)

The Antelope Valley basin is sub-divided into 12 sub-basins that are defined by faults that generally have no surface expression. The locations of these faults have been estimated largely through discontinuity of water levels caused by relatively low permeability of the fault zones. While these fault zones are not impermeable, they act as aquitards that restrict water flow between the sub-basins. The Neenach Sub-Basin is a 78-square-mile triangular area defined by the Neenach, Rosamond, and Randsburg-Mojave faults (Figure 4.7-4). (WDS 2005 [Appendix B]).

Prior to commencement of significant groundwater pumping for irrigation in the early 1900s, the water table was 150 to 200 feet bgs (WDS 2005 [Appendix B]). By the mid-1970s, the water table had dropped to approximately 350 feet bgs. Since that time, water levels have stabilized as delivery of SWP water by AVEK has partially replaced groundwater pumping. DWR data and recent modeling by U.S. Geological Survey indicate that the Project area has reached equilibrium, with water table levels varying little from year to year and averaging





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**Figure 4.7-4**  
**Faults and Groundwater Subbasins in Project Area**

approximately 340 feet bgs in the Project area (WDS 2005 [Appendix B]). The Project would store water in the portion of the aquifer that was dewatered by historic over-pumping. WDS and others estimate that there is at least 500,000 af of storage space available. The Neenach Sub-Basin aquifer is highly transmissive, wells consistently yield more than 1,000 gpm, and the water quality is excellent (Table 4.7-1). WDS estimates that the Project could support at least 0.5 foot/day (likely greater than 1.0 foot/day) of recharge totaling at least 100,000 af/year. Evaporative and aquifer losses would likely vary from 5 to 15 percent. These estimates are consistent with earlier estimates by Psomas and Hydrosience (Psomas 1998 and Hydrosience 1998 in WDS 2005 [Appendix B]).

Groundwater wells supplement water imported by AVEK to serve the irrigation and drinking water needs of the area. According to records maintained by DWR, there are hundreds of groundwater wells within 10 miles of the Project area. Many of these wells are located outside of the Neenach Sub-Basin. However, 10 wells are located within the area of the proposed recharge areas basins, and they range in depth from approximately 700 to 850 feet bgs (WDS 2005 [Appendix B]).

### **Adjudication of the Antelope Valley Groundwater Basin**

In 1999, W.M. Bolthouse Farms, Inc. and Diamond Farming Company initiated lawsuits against various municipal groundwater pumpers within the Antelope Valley, claiming that the ability of agricultural interests to pump groundwater in a cost-effective manner was being impaired due to increased pumping by municipal users. In September 2004, the Los Angeles Department of Public Works filed a cross-complaint seeking to quantify the rights to groundwater in the Antelope Valley. These complaints may result in a form of management of the groundwater basin called court adjudication. The courts study available data and arrive at a decision that guarantees to each party with rights to the groundwater a proportionate share of the water that is available each year.

The applicant believes that the Project could be developed in parallel with any adjudication process because the Project would store imported surface water only and therefore would not be subject to any limitations on groundwater supplies imposed by adjudication (WDS 2005 [Appendix B]). Operation of the Project would contribute 10 percent of all recharged water to the basin, providing a proposed net increase in available groundwater supplies.

### **Groundwater Quality**

Groundwater quality in the Antelope Valley has been assessed through sampling and chemical analyses by the U.S. Geological Survey (DWR 2003; WDS 2005 [Appendix B]). Results for samples collected from the basin indicate that the groundwater is of excellent quality. However, data were not available for groundwater samples analyzed for a complete suite of drinking water and ionic



parameters from wells in the immediate Project vicinity. Therefore, WDS collected and analyzed groundwater samples from two irrigation wells located in the area proposed for the recharge and recovery facilities. Results of those analyses are presented in Table 4.7-1. In addition to the results summarized in Table 4.7-1, the groundwater samples also were analyzed for pesticides (EPA Methods 507 and 508), herbicides (EPA Method 515.3), and volatile organic compounds (EPA Method 524.2); no contaminants were detected. Table 4.7-1 indicates that groundwater quality in the Project area does not exceed drinking water criteria and is of similar quality to the SWP water that has been used for irrigation on the land since 1974.

## Regulatory Framework

### Federal Regulations

The following sections describe federal water quality control programs, plans, and policies applicable to the Project site and environs.

#### Clean Water Act

Federal water quality regulations are primarily established in the Clean Water Act and administered by the EPA. The State Water Board, the Corps, and other state agencies implement these regulations as appropriate (refer to State Regulations below).

#### **Section 404**

Section 404 of the Clean Water Act regulates the discharge of dredged or fill material into waters of the United States. Under Section 404, the Corps is responsible for issuing permits (Section 404 permits) authorizing the placement of dredged or fill materials into jurisdictional waters. The ephemeral drainages that cross the proposed alignment of the delivery pipeline are characterized by a shallow bed and bank. They appear to be isolated waters that would not qualify as waters of the United States and therefore would not be subject to regulation by the Corps under Sections 401 and 404 of the federal Clean Water Act.

#### **Section 402**

The 1972 amendments to the federal Water Pollution Control Act established the NPDES permit program to control discharges of pollutants from point sources (Section 402). The 1987 amendments to the Clean Water Act created a new section of the act devoted to stormwater permitting (Section 402[p]). The EPA has granted the State primacy in administering and enforcing the provisions of the Clean Water Act and the NPDES permit program. The NPDES permit program is the primary federal program that regulates point-source and nonpoint-source discharges to waters of the United States.

The State Water Board issues both general and individual permits for certain activities. Relevant general and individual NPDES permits are discussed below.

**Construction Activities.** Construction activities are regulated under the General Construction Permit, provided that the total amount of ground disturbance during construction exceeds 1 acre. The Lahontan Regional Water Quality Control Board enforces the General Construction Permit in this area. Coverage under a General Construction Permit requires the preparation of an SWPPP. The SWPPP includes pollution prevention measures (erosion and sediment control measures and measures to control non-stormwater discharges and hazardous spills), demonstration of compliance with all applicable local and regional erosion and sediment control standards, identification of responsible parties, a detailed construction timeline, and a BMPs monitoring and maintenance schedule. Permittees are required to conduct annual monitoring and reporting to ensure that BMPs are correctly implemented and effective in controlling the discharge of stormwater-related pollutants. The owner/operator would obtain coverage under the NPDES General Construction Permit prior to any construction activities exceeding 1 acre.

## State Regulations

The following sections describe state water quality control programs, plans, and policies applicable to the Project.

### State Water Resources Control Board

Section 13260(a) of the Porter-Cologne Water Quality Control Act (contained in the California Water Code) requires that any person discharging waste or proposing to discharge waste within any region—other than to a community sewer system—that could affect the quality of the waters of the State file a report of waste discharge. The discharge of dredged or fill material may constitute a discharge of waste that could affect the quality of waters of the State.

Historically, California relied upon its authority under Section 401 of the federal Clean Water Act to regulate discharges of dredged or fill material to California waters. That section requires an applicant to obtain “water quality certification” from the State Water Board through its Regional Water Quality Control Boards to ensure compliance with state water quality standards before certain federal licenses or permits may be issued. The permits subject to Section 401 include permits for the discharge of dredged or fill materials (Clean Water Act Section 404 permits) issued by the Corps. Waste discharge requirements under the Porter-Cologne Water Quality Control Act were typically waived for projects that required certification.

In 2004, the State Water Board issued Water Quality Order No. 2004-004-DWQ. This order addresses general waste discharge requirements for discharges of dredged or fill material to waters deemed by the Corps to be outside of its jurisdiction and therefore not subject to Section 404 of the Clean Water Act. In general, these are waters found to be “isolated.” These requirements are restricted to discharges of less than 0.2 acre. If a discharge does not qualify for general waste discharge requirements, then a report of waste discharge must be filed using a 401 Certification Application.

The ephemeral drainages that cross the proposed alignment of the delivery pipeline are characterized by a shallow bed and bank and may be regulated by the State Water Board and the California Fish and Game Code (Arron pers. comm.).

### **Lahontan Regional Water Quality Control Board**

The Lahontan Regional Water Quality Control Board designates beneficial uses of surface and groundwater resources for the Project area and establishes applicable water quality objectives in the Water Quality Control Plan for the Lahontan Region, North and South Basins (California Regional Water Quality Control Board, Lahontan Region 1994). The jurisdiction of the Lahontan Regional Water Quality Control Board extends from the Oregon border to the northern Mojave Desert and includes all of California east of the Sierra Nevada crest. The Lahontan Region is further divided into the North and South Basins. Most of the waters of the North Lahontan Basin drain into closed basins that were previously part of Lake Lahontan. Waters of the South Lahontan Basin also drain into closed basin remnants of prehistoric lakes. The Antelope Valley Hydrologic Unit and the Neenach Sub-basin are in the South Lahontan Basin.

The Water Quality Control Plan for the Lahontan Region (California Regional Water Quality Control Board, Lahontan Region 1994) was reviewed for issues or objectives that would affect the Project. According to the plan, surface water can be beneficially used to recharge groundwater and also for delivery to the California Aqueduct and the Los Angeles Aqueduct. It should be noted that these approved beneficial uses apply to water originating within the basin and do not apply to imported SWP water. Groundwater can be used for agricultural, municipal, and industrial use. Both waters can also be used for fresh water replenishment. There are no special water quality objectives that apply to the Project area. The region-wide water quality objectives are consistent with the primary drinking water quality standards, which both the SWP surface water and the Neenach Sub-basin groundwater meet or exceed. No permits are necessary from the Lahontan Regional Water Quality Control Board for recharging SWP Aqueduct water into the Neenach Sub-basin.

## **Local Regulations**

### **Kern County General Plan**

The Kern County General Plan, adopted June 15, 2004, contains the following policies.

#### ***Land Use/Conservation/Open Space Element Resource***

##### **■ *Policies***

- To encourage effective groundwater resource management for the long-term economic benefit of the County the following shall be considered:
  - (a) Promote groundwater recharge activities in various zone districts.

- (b) Support for the development of Urban Water Management Plans and promote Department of Water Resources grant funding for all water providers.
  - (c) Support the development of groundwater management plans.
  - (d) Support the development of future sources of additional surface water and groundwater, including conjunctive use, recycled water, conservation, additional storage of surface water and groundwater and desalination.
- Minimize the alteration of natural drainage areas. Require development plans to include necessary mitigation to stabilize runoff and silt deposition through utilization of grading and flood protection ordinances.

### *Surface Water and Groundwater*

#### ■ *Policies*

- Ensure that water quality standards are met for existing users and future development
- Ensure that adequate water storage, treatment, and transmission facilities are constructed concurrently with planned growth.
- Encourage the development of the County's groundwater supply to sustain and ensure watery quality and quantity for existing users, planned growth, and maintenance of the natural environment.
- Review development proposals to ensure adequate water is available to accommodate projected growth.
- Drainage shall conform to the Kern County Development Standards and the Grading Ordinance.
- Discretionary projects shall analyze watershed impacts and mitigate for construction-related and urban pollutants, as well as alterations of flow patterns and introduction of impervious surfaces as required by the California Environmental Quality Act, to prevent the degradation of the watershed to the extent practicable.

#### ■ *Implementation Measures*

- Encourage effective groundwater resource management for the long-term benefit of the County through the following:
  - Promote groundwater recharge activities in various Zone districts.
  - Support for the development of Urban Water Management Plans and promote Department of Water Resources grant funding for all water providers.
  - Support the development of Groundwater Management Plans.
  - Support the development of future sources of additional surface water and groundwater including conjunctive use, recycled water,



conservation, additional storage of surface water, and groundwater and desalination.

### **Kern County Groundwater Export Ordinance**

The Kern County Board of Supervisors adopted Ordinance No G-6502 on June 11, 1998, to regulate the export or transfer of native groundwater outside of Kern County. This ordinance requires a conditional use permit for export of water to areas both outside the County and within the watershed areas of underlying aquifers in the County. The ordinance applies only to the southeastern drainage of the Sierra Nevada and Tehachapi mountains in the South Lahontan Hydrologic Region in eastern Kern County. Water banks and recharge projects are specifically excluded from the ordinance.

This Project is designed with the intent of this ordinance in mind, and will not export any native groundwater. Additionally, this Project will satisfy the requirements not to harm any groundwater user by establishing a committee of landowners and officials to monitor the operation of the groundwater bank such that any possible impacts are proactively mitigated. One such self-imposed measure is to ensure, through adequate monitoring and accounting, that no more than 90 percent of the water delivered to the groundwater bank be withdrawn. Not only would this ensure that no native groundwater was extracted, but it would also ensure that adjacent landowners are not negatively affected by the Project.

### **Willow Springs Specific Plan**

A relevant mitigation/implementation measure from the WSSP (Kern County Planning Department 1992) is provided below.

### **Water Quality and Availability**

#### ■ *Mitigation/Implementation Measure*

- As required by state law, water conservation measures identified in the Environmental Impact Report shall be incorporated into the individual projects. The following water conservation measures shall be implemented where applicable and feasible:

Exterior:

- Landscape with low-water-consuming plants wherever feasible.
- Minimize use of lawn by limiting it to lawn-dependent uses, such as playing fields. When lawn is used, require warm season grasses.
- Group plants of similar water use to reduce over irrigation of low-water-using plants.
- Provide information to occupants regarding benefits of low-water-using landscaping and sources of additional assistance.
- Use mulch extensively in all landscape areas. Mulch applied on top of soil will improve the water-holding capacity of the soil by reducing evaporation and soil compaction.

- Preserve and protect existing trees and shrubs. Established plants are often adapted to low-water-using conditions, and their use saves water needed to establish replacement vegetation.
- Install efficient irrigation systems which minimize runoff and evaporation and maximize the water which will reach the plant roots. Drip irrigation, soil moisture sensors, and automatic irrigation systems are a few methods to consider in increasing irrigation efficiency and may be feasible for the projects.
- Use pervious paving material whenever feasible to reduce surface water runoff.
- Investigate the feasibility of utilizing reclaimed wastewater, stored rain water, or gray water for irrigation.

### **Los Angeles County General Plan**

A relevant goal and policies from the Los Angeles County General Plan (Los Angeles County 1993) are provided below.

#### ***Ecological Resources***

##### **■ *Goal***

- To conserve water and protect water quality.

##### **■ *Policies***

- Protect groundwater recharge and watershed areas, conserve storm and reclaimed water, and promote water conservation programs.
- Encourage the maintenance, management, and improvement of the quality of imported domestic water, groundwater supplies, natural runoff, and ocean water.
- Protect watershed, streams, and riparian vegetation to minimize water pollution, soil erosion, and sedimentation, maintain natural habitats, and aid in groundwater recharge.

### ***Antelope Valley–East Kern Water Agency Urban Water Management Plan***

AVEK sells imported water from the California Aqueduct as part of the SWP. Currently, AVEK has an allocation for purchasing up to 141,400 af of water per year from the SWP. AVEK is a wholesaler of SWP water to urban water retailers and does not have production groundwater wells. As a wholesaler of SWP water, AVEK is required to submit an urban water management plan. The AVEK Urban Water Management Plan was adopted on December 20, 2005.

The plan discusses the agency's supplies, possible reasons for reductions in supplies, and measures that can be implemented to reduce the severity of those reductions. AVEK does not have plans to provide additional groundwater storage of surface water supplies at this time; however, according to the urban water management plan, it is "...actively involved with the planning stages and coordination of a fully regional water banking program." (AVEK 2005). The Project could assist AVEK and its customers by providing additional storage for

their water allocations from the SWP. Water stored in a water bank in the Neenach Sub-basin could reduce the severity of water shortages during drought years, adding an additional tool for AVEK and its customers to use.

### **Antelope Areawide General Plan**

Relevant policies from the Antelope Areawide General Plan (Kern County Planning Department 1992) are provided below.

### ***Environmental Resource Management***

#### ***Managed Resource Production***

##### **■ Policies**

- Maintain, where feasible, aquifer recharge zones to assure water quality and quantity.
- Protect and manage watershed areas to maximize water yield in combination with public needs for fire protection, maintenance of habitat and recreation.

## **Impact Analysis**

This section describes the CEQA impact analysis relating to hydrology and water quality for the Project. It describes the methods used to determine the Project's impacts and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion.

## **Methodology**

Regulations and policies presented above guide the approach and assumptions used to assess the impacts of the Project. Several issues related to potential effects on hydrology and water quality were considered as impact assessment variables. This section specifically addresses surface water and groundwater supplies and quality from local and regional perspectives.

As discussed in the Chapter 3, "Project Description," the operating conditions and the ability of the Project to store water would be determined primarily by:

- availability of SWP water,
- availability of conveyance capacity in the California Aqueduct and in the AVEK West Feeder,
- the percolation rate and total area available to recharge water,
- the ability of the groundwater basin to store and transmit water,
- hydrologic conditions that would influence the volume and timing of diversions of water for storage at the Project from the SWP operations,

- farmer irrigation demand within the Project's service area, and
- maintaining adequate groundwater quality.

It is anticipated that the Project would store existing entitlements to imported surface water from the California Aqueduct. As such, there would be no additional entitlements sought for this Project. The main focus of this Project is to enhance water supply reliability and flexibility through the storage of existing imported surface water allocations by Project participants in accordance with authorized SWP operations. Authorized SWP operations would not change due to the Project. The impact analysis below focuses on issues related to water quality, groundwater supplies and pumping, and drainage.

## Thresholds of Significance

The Kern County CEQA Implementation Document and Kern County Environmental Checklist state that a project would have a significant impact on hydrology or water quality, if it would:

- violate any water quality standards or waste discharge requirements;
- substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level;
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on or off site;
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off site;
- create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- otherwise substantially degrade water quality;
- place housing within a 100-year flood hazard area as mapped on the federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;
- place within a 100-year flood hazard area structures which would impede or redirect flood flows;
- expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam; or
- cause inundation by seiche, tsunami, or mudflow.

## Impacts and Mitigation Measures

### Impact 4.7-1: Degradation of Water Quality Resulting from Construction Runoff

The Project would potentially cause degradation of water quality from construction-related activities. Construction and installation of recharge basins, pipelines, recovery wells, and support buildings would require grading and excavation. Although construction would be intermittent, stormwater runoff could cause soil erosion—which would result in sediment conveyance—and transport of other construction-related contaminants (e.g., fuels, soil, concrete, and paint) to nearby receiving waters. This potential impact is significant because it could result in violation of established federal and state water quality standards.

#### Mitigation Measures

**Mitigation Measure 4.7-1:** To reduce or eliminate construction-related water quality effects, before onset of any construction activities, the owner/operator or its contractor will obtain coverage under the NPDES General Construction Permit. The owner/operator will be responsible for ensuring that construction activities comply with the conditions in this permit, which will require development of a SWPPP, implementation of BMPs identified in the SWPPP, and monitoring to ensure that effects on water quality are minimized.

As part of this process, the owner/operator will implement erosion and sediment control BMPs in areas with potential to drain to surface water. These BMPs will be selected to achieve maximum sediment removal and represent the best available technology that is economically achievable. BMPs to be implemented as part of this mitigation measure may include, but are not limited to, the following measures.

- Temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover) will be employed to control erosion from disturbed areas.
- Drainage facilities in downstream offsite areas will be protected from sediment using BMPs acceptable to the Lahontan Regional Water Quality Control Board.

The owner/operator or its agent will perform routine inspections of the construction area to verify that the BMPs specified in the SWPPP are properly implemented and maintained. The owner/operator will notify its contractors immediately if there is a noncompliance issue and will require compliance.

**Mitigation Measure 4.7-2:** Prior to any construction activities, the applicant shall develop and implement a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities for all contractors.

The plan and methods shall be in conformance with all state and federal water quality regulations.

The applicable agency, Kern County Environmental Health Services Department and Los Angeles County Environmental Health Services, shall review the SPCCP before the onset of construction activities. The applicant shall provide for routine inspection of the construction area to verify that the measures specified in the SPCCP are properly implemented and maintained and further ensure that contractors are notified immediately if there is a noncompliance issue and will require compliance.

The federal reportable spill quantity for petroleum products, as defined in EPA's CFR (40 CFR 110), is any oil spill that 1) violates applicable water quality standards, 2) causes a film or sheen upon or discoloration of the water surface or adjoining shoreline, or 3) causes a sludge or emulsion to be deposited beneath the surface of the water or adjoining shorelines.

If a spill is reportable, the contractor's superintendent shall notify the applicant who shall inform the applicable County agency and arrange for the appropriate safety and cleanup crews to ensure the spill prevention plan is followed. A written description of reportable releases must be submitted to the Regional Water Quality Control Board and the applicable County agencies. This submittal must include a description of the release, including the type of material and an estimate of the amount spilled, the date of the release, an explanation of why the spill occurred, and a description of the steps taken to prevent and control future releases. The releases would be documented on a spill report form.

If a spill has occurred, the applicant shall coordinate with responsible regulatory agencies to implement measures to control and abate contamination.

**Level of Significance after Mitigation:** Less than significant.

### **Impact 4.7-2: Depletion of Groundwater Supplies within Antelope Valley**

The Project would store water in the portion of the aquifer that was dewatered by historical over-pumping. A portion of water applied to recharge ponds would be lost to evaporation, and an additional portion of the recharged water would not be recoverable because of retention in the currently unsaturated aquifer materials and lateral migration away from the Project well field.

Recharge basins are operated with fairly shallow water levels of only a few feet. The water in these basins heats up, and a portion is lost to evaporation. The applicant estimates that 2–3 percent of recharge pond water would be lost to evaporation during the November through April time frame and that 6–7 percent would be lost during the May through October time frame. Water applied to the recharge basins but then lost to evaporation is not accounted for as stored water (WDS 2005 [Appendix B]).

During the first year of recharge, there is an initial loss of recharged water that is bound to aquifer materials by a surface tension that prevents gravity drainage (commonly known as specific retention). This is typically a first-year impact that is not experienced in subsequent years. The applicant indicates that first year specific retention losses may be approximately 5 percent. Additionally, there is typically a lag of 1–3 years between recharge and recovery. Recovery events usually do not recover the entire banked amount (reserving stored water for infrequent, severe droughts). The banked water (or the mound) migrates laterally during these lag times, with a portion flowing beyond the reach of Project recovery wells. Therefore, as a practical matter, it can be expected that a portion of the stored water would migrate beyond the reach of the Project recovery well field and become inaccessible as a result of constraints imposed by the monitoring committee (WDS 2005 [Appendix B]).

The applicant proposes to estimate evaporative losses based on the season of application and then subtract evaporative losses from the amount of water applied to the recharge basins to arrive at the amount of water *stored* in the bank. Because the owner/operator would leave at least 10 percent of the *stored* water in the aquifer, there would be a beneficial impact on groundwater levels in the Neenach Sub-basin.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant

### **Impact 4.7-3: Substantial Impacts on Surrounding Groundwater Wells Attributable to Recovery Operations**

During recharge operations, nearby groundwater wells may experience an increase in static groundwater surface elevation; a beneficial effect in this over-drafted area. During recovery, the owner/operator will preferentially operate wells that draw from the recharge mound. However, nearby wells may experience a temporary decrease in static water surface elevation to near or below baseline (pre-Project) levels. This latter effect, if it occurs, would be localized and temporary. The effect would be localized because it would be limited to the area within the influence of the recovery wells being pumped. Because the transmission of water between the sub-basins in Antelope Valley is impeded by faults, impacts are not expected outside of this Neenach Sub-basin.

The effect would be temporary because the water surface elevation would stabilize after recovery operations ceased and recover during subsequent recharge operations. In the long-term, the aquifer will have more water than it would in the absence of the Project, and neighboring groundwater users will benefit. Nonetheless, this potential impact is significant because it could result in a lowering of the local groundwater table level. A mitigation measure has been imposed requiring a monitoring committee. This potential impact is less than significant because (1) in the long-term the aquifer would have more water than it would in the absence of the Project, (2) neighboring groundwater users would

benefit, and (3) the monitoring committee would ensure that recovery operations do not cause unacceptable short-term impacts on adjacent landowners.

### **Mitigation Measure**

***Mitigation Measure 4.7-3:*** A monitoring committee shall be formed to monitor the impact of operations on groundwater levels and quality and to ensure that adjacent landowners are protected. The monitoring committee would be responsible for development of a detailed monitoring and operational constraints plan and would ensure that it is implemented. The plan shall include the following:

- monitoring recovery operations to ensure that 10 percent of the stored water is left behind to help alleviate overdraft;
- monitoring water quality in recovered water and in groundwater flowing away from the Project to ensure that water quality remains appropriate for designated beneficial uses;
- during recharge operations, monitoring water levels in perimeter wells, and shutting down recharge operations in the event that offsite water levels rise to within 20 feet of the ground surface; and
- during recovery operations, monitoring water levels in offsite wells and adjusting operations, providing compensation, or providing an alternate source of water in the event that water levels drop to unacceptable levels in offsite wells as a consequence of operations.

Composition of the monitoring committee shall include the following representatives:

- the owner/operator,
- the Rosamond Community Service District,
- the Antelope Valley State Water Project Contractors Association (a joint powers authority including AVEK, Palmdale Water District, and Littlerock Creek Irrigation District),
- neighboring landowners and/or other selected representatives, and
- Kern County and Los Angeles County representatives.

The monitoring committee would meet monthly during recharge/recovery periods and semiannually during other periods when the Project is not in operation.

**Level of Significance after Mitigation:** Less than Significant.



#### **Impact 4.7-4: Substantially Alter the Existing Drainage Pattern or Contribute to Existing Local or Regional Flooding**

There are no perennial streams in the area proposed for the recharge and recovery facilities, with the closest feature being the terminus of the distributary channel of ephemeral Cottonwood Creek 1 mile north, as indicated on Figure 4.7-1. There are three unnamed ephemeral drainages along the proposed alignment of the delivery pipeline.

Currently, farmers in the area proposed for the recharge basins direct runoff water away from their fields, and it flows along the roadways. It is not proposed that the existing drainage patterns would change. The berms and canals that are proposed for construction would contain and convey imported surface water, not capture or redirect local runoff. As such, the applicant anticipates that any new project features would be less than 1 foot higher in elevation than the 100-year flood elevation (as predicted at the upslope edge of the project, i.e., near Holiday Avenue). Local runoff would continue to flow along existing roadways.

The proposed delivery and distribution pipelines would be buried, and construction areas would be recontoured to be consistent with preconstruction conditions. The pipelines would not alter existing drainage patterns.

There would be no impact because the Project would not alter existing drainage patterns or contribute to local or regional flooding.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

#### **Impact 4.7-5: Potential Impacts on Groundwater or Surface Water Quality from Recharge or Recovery Operations**

Imported surface water from the SWP would be used to recharge the groundwater basin in the Neenach Sub-basin. As described under Environmental Setting, the source of the water being recharged (SWP water) and the receiving water (groundwater in the Neenach Sub-basin) meet state and federal drinking water standards. The recharge of SWP water would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade water quality. This analysis is confirmed in that SWP water has been applied to the Project area since the 1974, without degradation to the groundwater quality. Likewise, the recovery of stored water from the aquifer and its subsequent discharge into the SWP would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade water quality.

There are no known hazardous waste sites located on areas proposed for recharge (Appendix G), and, as noted above, analyses of groundwater samples from the

Project area do not indicate contamination. Additionally, there is no indication that soils in the area are saline or would otherwise contribute solids to the aquifer as a result of recharge. In light of what is known, potential impacts on groundwater or surface water quality from recharge or recovery operations are expected to be less than significant. However, because the volume of water being recharged would exceed historic water application rates, unexpected impacts could result. Therefore, this potential impact is significant.

**Mitigation Measures:** Implement Mitigation Measures 4.7.1 and 4.7-2

**Level of Significance after Mitigation:** Less than Significant.

## Cumulative Impact

Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The cumulative impact scenario for the Project includes seven specific projects identified by Kern and Los Angeles Counties, and buildout of the Kern County General Plan. A detailed description of the cumulative impact scenario considered with the proposed Project is provided in Chapter 3, "Project Description," and the project list is presented below.

A cumulative impact analysis first identifies whether a cumulatively significant impact exists in the given resource area. If so, it determines whether the project will make a considerable contribution to that impact. Where a cumulative impact is severe, even a small contribution may be considerable (Section 15130(b) of the State CEQA Guidelines).

**Table 4.7-2. Relevant Cumulative Projects**

Case Number (if applicable)	Project Name	Project Location	Approximate Distance to Project Site	Project Type	Project Description
<b>Kern County</b>					
GPA 1, Map 218	Tejon Mountain Village Specific Plan	East of I-5 in the hills north and east of Castaic Lake	14 miles northwest of project site	Major Residential/commercial/recreational development	3,450 single family units (s.f.u.) homes on 23,000-acre planning area,
GPA, Map 255	Lebec Canyon Estates	East of Frazier Mountain Park Road/I-5 interchange	22 miles west of project site	Residential development	32 s.f.u on 1,000 acres
SPA 8, Map 254, Amend. Zone Map 254, Zone Change 6, SP 1, Map 254, Vesting Tent. Tract 6436	Frazier Park Estates	Southern boundary of Kern Co. and portion of LA County, west of I-5 south of Frazier Mountain Park Road	24 miles west of project site	Residential / Commercial development	705 s.f.u. and 135 thousand sq. ft of commercial on 847 acres in Kern County and 323 in LA County
GPA to 5.7, Map 215	Christine Bower	One quarter mile west of 105 <sup>th</sup> Street and McConnell Road near Rosamond	3 miles north of project site	General Plan Amendment and Zone	4 s.f.u on 20-acre site
ZC to A-1, Map 231	Julien and Assoc.	8684 Sweetser Road, Rosamond (APN 315-081-09)	3-1/2 miles northeast of project site	Commercial greenhouses	60-acre site
<b>Los Angeles County</b>					
N/A	Centennial Specific Plan	1 mile east of I-5, adjacent to SR-138	12 miles southwest of project site	Large-scale new community; including residential/commercial development	23,000 dwelling units and 14 million sq. ft. commercial on 11,700 acres
N/A	Gorman Ranch	Gorman Post Road, north of SR-138, east of I-5	17 miles southeast of project site	Residential	227 s.f.u. on 2,500 acres

## **Kern County General Plan and Relevant Projects**

The draft Program EIR for the Kern County General Plan Update (July 2003) (GP PEIR) Kern County General Plan Update EIR did not specifically address cumulative impacts on hydrology and water quality. The large projects in the cumulative scenario are located considerable distances from the Project site and are located in different groundwater subbasins and local drainage basins.

Impact 4.7-1 identifies the potential for the Project to degrade water quality as a result of construction runoff, although mitigation requires the preparation of a SWPPP to minimize these potential effects through the use of best management practices (BMPs). Similar requirements will be applied to all other projects in the cumulative scenario meeting specified criteria (i.e., disturbance of more than 1 acre of soil), resulting in the avoidance of significant cumulative impacts related to surface water quality.

### **Groundwater Considerations**

Prior to commencement of significant groundwater pumping for irrigation in the early 1900s, the water table was 150 to 200 feet bgs. By the mid-1970s, the water table had dropped to approximately 350 feet bgs. Since that time, water levels have stabilized as delivery of SWP water by AVEK has partially replaced groundwater pumping. Nonetheless, the historical overdraft condition persists.

In 1999, W.M. Bolthouse Farms, Inc. (Bolthouse) and Diamond Farming Company (Diamond) initiated lawsuits against various municipal groundwater pumpers in the Antelope Valley, claiming that the ability of agricultural interests to pump groundwater in a cost-effective manner was being impaired by increased pumping by municipal users. In September 2004, LADPW filed a cross-complaint seeking to quantify the rights to groundwater in the Antelope Valley, which is essentially a call for adjudication, a legal process that allocates the right to produce water from the available natural groundwater supply (WDS 2005).

In light of the persistent aquifer overdraft condition and the ongoing legal challenges concerning groundwater pumping, groundwater overdraft is a significant cumulative impact without the Project. Although Project impacts will be evaluated by both Los Angeles County and Kern County on a project-specific level and efforts will be made to avoid or minimize any impact, the cumulative scenario in aggregate would amplify this effect.

The Project would recover only up to 90% of the surface water that is recharged. The Project is therefore expected, in the long term, to reduce the rate of aquifer overdraft, which is a beneficial impact. With respect to potential short-term, localized impacts, a Monitoring Committee would monitor water levels in perimeter wells and impose operational constraints to avoid or minimize impacts. The incremental effect of the Project would not result in a considerable contribution to cumulative impacts.

**Mitigation Measures:**

Implementation of Mitigation Measures 4.7-1 (comply with NPDES general construction permit), 4.7-2 (implement an SPCCP), and 4.7-3 (develop and implement a monitoring and operational constraints plan) will reduce the impacts of the proposed Project and therefore eliminate any potential for a cumulative effect.

**Level of Significance after Mitigation:** Cumulative impacts would be less than significant.

## 4.8 Land Use and Planning

### Introduction

This section describes the environmental setting for land use and planning, the impacts on land use and planning that could result from the Project and any necessary mitigation measures that would reduce significant impacts.

### Environmental Setting

#### Existing Conditions

##### Project Vicinity

The Project area is located in an unincorporated area of eastern Kern County and northern Los Angeles County, about 10 miles west of the community of Rosamond and 17 miles northwest of the City of Lancaster. The Kern County/and Los Angeles county line bisects Antelope Valley and lies immediately south of the area proposed for the recharge and recovery facilities.

#### Existing Land Uses and Designations

The recharge and recovery facilities are proposed for areas that are subject to the Willow Springs Specific Plan (WSSP) (Kern County Department of Planning and Development Services 1992). One of the goals of the WSSP is to foster the development of industrial parks, though such development has not occurred at or near the recharge and recovery facilities. Of the 10 parcels planned for recharge basin construction, four are designated for Intensive Agricultural Uses. The other six parcels (approximately 988 acres) have the current land use designations of Resource Management, Residential, and Light Industrial. The Kern County Zoning Ordinance indicates a zoning designation for the entire recharge and recovery facilities area of A (Kern County Department of Planning and Development Services 1969). The Project would not be consistent with the existing Specific Plan designations but would be consistent with the zoning designation for the area and current uses of the area. As part of this Project, the WDS is requesting a Specific Plan amendment to change the Specific Plan land use designations to Intensive Agriculture. The six parcels requested for redesignation are currently under cultivation or fallow.

The alignment of the proposed new delivery pipeline extends south from the recharge area into Los Angeles County. The parcels immediately adjacent to the pipeline alignment are primarily agricultural lands or undeveloped. The Los Angeles County General Plan's General Development Policy Map designates the

area as part of a large area of land intended for agricultural or other non-urban development (Los Angeles County Department of Regional Planning 1980).

## Surrounding Land Uses

Surrounding the recharge area are lands zoned by the Kern County General Plan as A (Exclusive Agriculture), E (Estate [1/4 to 20 acres]), C (Commercial), R (Residential), and SP (Special Planning). The WSSP designates the land uses as 5.3, 5.6, and 5.7 (Residential), 7.1 (Light Industrial), 8.1 (Intensive Agriculture), and 8.5 (Resource Management). Actual land use in the area is limited primarily to agriculture and scattered rural residences. A private airstrip, Skyotee Ranch Airport, is located just east of the area proposed for the recharge basins. A mortuary/cemetery is located north of Buckhorn Avenue between 188<sup>th</sup> Street and 120 Street (Figure 3-5). Much of the nearby lands are undeveloped. There are no public buildings (schools, fire or police stations, libraries), parks, or golf courses in the vicinity of the Project.

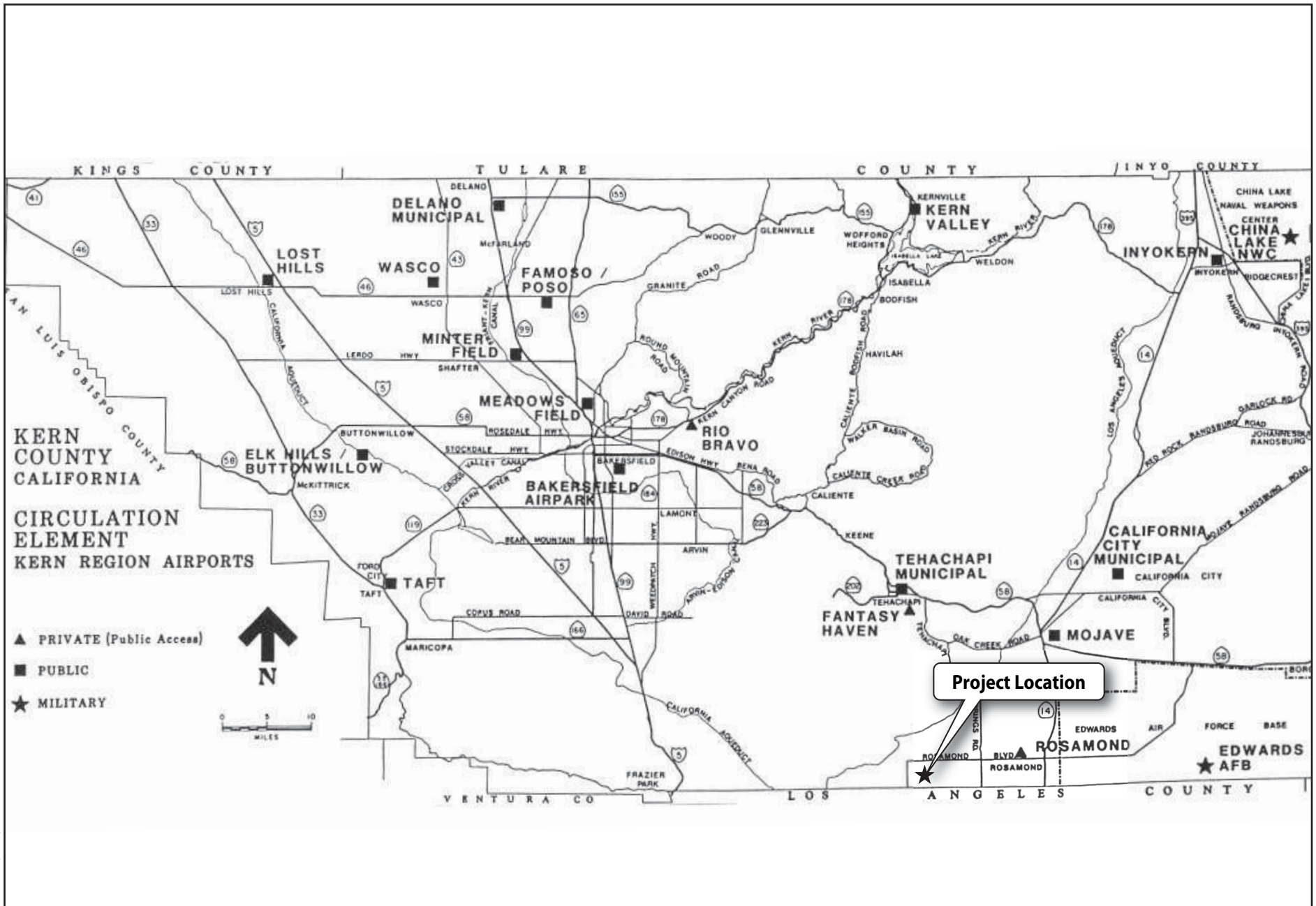
According to a survey of land uses throughout the Antelope Valley, agriculture is also the predominant land use (outside of the urbanized areas) across northern Los Angeles County. The Antelope Valley Areawide General Plan identifies a broad expanse of agricultural uses that extends from the community of Gorman in the northwest to the City of Lancaster, which lies approximately 17 miles East-Southeast of the pipeline route. Crops historically grown in this area have been dry-farmed wheat in the west, progressing to irrigated alfalfa and onions on the Valley floor (Los Angeles County Department of Regional Planning 1986). Actual land use along the alignment of the proposed new delivery pipeline is primarily limited to agriculture and scattered rural residences, and most of the limited development lies at the south end of the alignment (Figure 3-5). There are no public facilities or features in the area except for the Antelope Valley Poppy Preserve, which lies approximately 1 mile east of the pipeline alignment.

Edwards Air Force Base (AFB) lies 15 miles to the east. Rosamond Skypark, a privately operated airport that is open for public use and provides aircraft parking and fueling facilities, lies approximately 10 miles east of the (see Figure 4.8-1). Bird aircraft strike hazards are addressed in Section 4.6, Hazards and Hazardous Materials.

## Regulatory Framework

### State Regulations

The State of California recognizes the military's needs for low-level flight paths special use airspace to train personnel and test weapon systems effectively. The State also recognizes that the development of certain land uses may impair the military's ability to train personnel and test weapon systems. As such, Senate Bill 1462 requires state agencies to consider the effects of civilian land uses that may be incompatible with the military's use of its assets. The Bill authorizes any



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**Figure 4.8-1  
Kern County Airport Location Map**



branch of the U.S. Armed Forces to consult with a public agency and a project applicant to discuss the potential alternatives, mitigation measures, and the effects of the Project on its military installations.

The California Military Land Use Compatibility Analyst (CMLUCA) was developed by the Governor's Office and Planning and Research to help Project sponsors determine whether a proposed project has the potential to affect military readiness and requires local planning agencies to notify the military whenever of proposed development is located within 1,000 feet of a military installation, within special use airspace, or beneath a low-level flight plan. The Joint Service Restricted Air Space was created by the Department of Defense and the Federal Aviation Administration (FAA) in recognition that aircraft associated with these military installations extends well beyond their boundaries. The area covered by the Joint Service Restricted R-2508 Complex includes 20,000 square miles in which unrestricted military flights are permitted at near ground level in some locations. The area also includes other restricted airspaces, such as R-2515, which is adjacent to Edwards AFB and includes the Project site.

Research was also performed using the CMLUCA. According to CMLUCA records, the proposed Project is located in a low-level flight path. Follow up discussions with a representative from Edwards AFB confirmed that the proposed Project is located in an area in which military aircraft associated with both the U.S. Air Force and U.S. Navy travel at heights of approximately 200 feet above ground level (Deakin pers. comm.).

### **Kern County General Plan**

Land use within the area proposed for recharge basins is governed by the *Kern County General Plan* (Kern County Planning Department 2004), which contains policies, goals, and guidelines for implementation with regards to future land uses, growth patterns, and development within the county. Policies applicable to land use are discussed throughout Chapter 4 in the various resource sections.

### **Circulation Element**

The County's Circulation Element identifies the general location of major thoroughfares, transportation routes, utilities, and facilities. Section 2.5.2, Airport Land Use Compatibility Plan addresses the issues, goals, policies, and implementation measures associated with Kern County's Airport Land Use Compatibility Plan (ALUCP), which was developed to comply with the State Aeronautics Act (Public Utilities Code, Section 21670 *et. seq.*). The primary goal of the ALUCP is to plan for land uses that are compatible with public airports and military bases. The County reviews discretionary land use development applications within an airport influence area and the military base operating area shown in the ALUCP to determine consistency with the General Plan.

### **Airport Land Use Compatibility Plan**

The Kern County Airport Land Use Compatibility Plan, which was originally adopted by the County Board of Supervisors in 1996 and amended in 2003, is a guidance document for the regulation of land uses around the public use airports found in the County. The document supplements the County's General Plan and

the specific area plans or general plans associated with specific cities in which public use airports reside. The plan addresses 14 public airports, two private airports that are open to the public, the Joint Service R-2508 Military Airspace Complex and two military installations—Edwards AFB and the China Lake NWC.

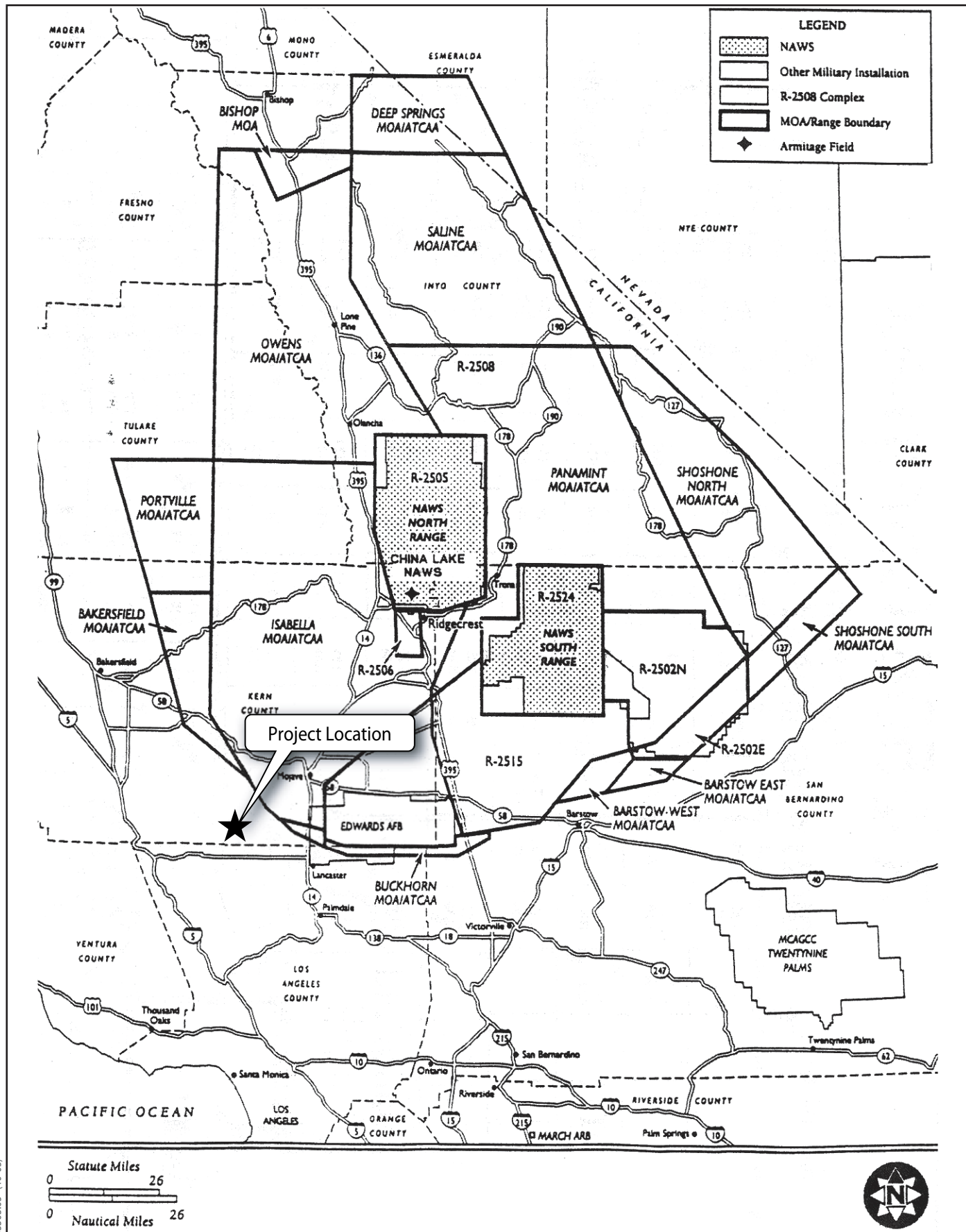
The ALUCP identifies the following:

- properties on which the land uses could be affected by present or future aircraft operations at the airports included in the plan;
- properties on which the land uses could affect operations at the airports identified
- a specific influence area for each airport; and
- properties underlying military aviation flights, including military aircraft and weapons.

The purpose of the ALUCP is to establish procedures and criteria by which the County and any affected cities can address compatibility issues when making decisions regarding airports and the land uses around them. The land use compatibility criteria included in the ALUCP are intended to ensure that local General Plans, specific plans, and zoning ordinances should be made consistent with the ALUCP. The ALUCP is also considered a source document under CEQA. In addition to those items noted specifically in the State of California Public Utilities Code (Section 21676), proposals for land use developments within an airport influence area that have the potential to substantially affect nearby airport activities or be substantially affected by those activities shall be subject to review to determine their compatibility with airport activities (Kern County 2003).

Based on the extreme needs of the military aircraft, military officials and the County remain concerned about land development that compromises the mission of the installations while addressing the need to preserve public health, safety, quality of life, and economic stabilities. Military officials have identified specific types of land develop that have the potential to compromise the mission on its facilities and must be reviewed, including: high-density residential use, commercial development that creates structures or towers that create obstructions into protected airspace, noise impacts, airspace conflicts, environmental pressures, and radio frequency conflicts. Environmental conflicts can include a myriad of potential impacts, such as activities that generate dust, steam or smoke; activities that create new lakes or golf courses that can attract large flocks of birds which can pose wildlife strike hazards (Kern County 2003).

According to the ALUCP, the Project site is outside of the area of influence associated with Rosamond Skypark. However, the proposed Project would be located within the areas of influence associated with the China Lake NAWS and Edwards AFB Joint Service Restricted R-2058 Complex (see Figure 4.8-2). The primary mission of each facility is to test military aircraft and weapon systems. Based on their missions, aircraft from these facilities travel at supersonic speeds



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**Figure 4.8-2**  
**Areas of Influence -**  
**China Lake NAWS and Edwards AFB Joint Service Restricted Complex**

and need to fly as low as 200 feet above the ground floor. (Kern County 2003.) According to the ALUCP, China Lake NAWS and Edward AFB staff must be notified about projects that have the potential to affect protected airspace.

Bird aircraft strike hazards are addressed in Section 4.6, Hazards and Hazardous Materials.

### ***Military Readiness Element (In Progress)***

The County is preparing a new Military Readiness Element to address the impact of new growth on military readiness activities. The Element recognizes that Naval Air Warfare Station (NAWS) China Lake, Edwards AFB, and the Joint Service Restricted R2508 Airspace Complex as essential components in California's integrated system of military installations and special use airspace, as well as their importance in the County's economy.

The Governors Office of Planning and Research is currently preparing guidelines for the formulation and implementation of military readiness elements, which the County would use to complete this element and incorporate it into the General Plan. Upon completion, the new element would address the impact of new growth on military readiness activities carried out on military bases, on property adjacent to the military facilities, and underlying designated military aviation routes and airspace.

Bird aircraft strike hazards are addressed in Section 4.6, Hazards and Hazardous Materials.

### ***Willow Springs Specific Plan***

Kern County recognizes that certain areas within their jurisdiction may not be adequately serviced by such a broad document as a General Plan and may therefore require specialized treatment. Specific Plans and Rural Community Plans are accepted tools for providing this individual attention, and the recharge and recovery area falls within the boundaries of the WSSP.

Appendix A to the *Kern County General Plan* states that all Specific Plans adopted prior to the 2004 update of the General Plan are thereby incorporated by reference into the General Plan (Kern County Planning Department 2004). The WSSP was adopted in 1992.

The WSSP (Kern County Planning Department 1992) contains goals, policies and standards that are compatible with the General Plan but are designed specifically to meet the needs of the Willow Springs area. The WSSP governs the land use in the Project area and defines land use designations consistent with those set forth in the County's General Plan. The Project site contains parcels designated as Residential, Light Industrial, and Resource Management. The WSSP identifies the following relevant goals and policies with respect to land use in the Project area:

**Resource Element****■ Goal**

- Encourage retention of productive agricultural and dormant mineral resources by imposing a restriction on allowing urban type land uses on nearby adjacent lands.

**■ Policy**

- Require review of discretionary projects in those areas designated for Resource use by the appropriate agency to determine potential resource loss.

**Land Use  
Industrial****■ Goal**

- To encourage development of industrial parks, with appropriate buffers, particularly where an industrial use lies adjacent to all sensitive and residentially designated land uses.

**■ Policy**

- The expansion of industrial development will be encouraged when such expansion maintains continuity of existing development, allows for incremental expansion of infrastructure and public services, minimizes impacts on natural environmental resources, and provides a high quality environment for industry.

Despite the WSSP's goal to foster industrial development at the proposed recharge basin sites, land within the Project area has been historically, and is currently engaged in agricultural uses. Much of the site is currently planted with field and row crops (carrots, onions, barley, and wheat). In order to facilitate use of the land for the Project, an amendment to the Specific Plan has been requested by WDS to redesignate all parcels within the area proposed for recharge basins as Intensive Agriculture.

**Kern County Zoning Ordinance**

The land use categories set forth in the General Plan and Specific Plan are implemented by the *Kern County Zoning Ordinance* (Kern County Planning Department, 2005). Most of the land in the Project area is zoned A, or Estate (E). The Project proponents propose to rezone the Project area to either A, or Light Agriculture, both of which permits construction and operation of water storage and groundwater recharge facilities (Kern County Zoning Ordinance Sec. 19.12.020F & 19.14.020G).

**Los Angeles County General Plan**

A relevant goal and policy from the Los Angeles County General Plan are provided below.

**Land Use****Quality, Compatible Design****■ Goal**

- To encourage high quality design in all development projects, compatible with, and sensitive to, the natural and manmade environment.

**■ Policy**

- Promote planned industrial development in order to avoid land use conflicts with neighboring activities.

**Antelope Valley Areawide General Plan**

The Antelope Valley Areawide General Plan (County of Los Angeles Department of Regional Planning 1986) is a component of the Los Angeles County General Plan and sets forth the following relevant policies.

**Land Use****Environmental Sensitivities****■ Policies**

- Designate significant plant and wildlife habitats in the Antelope Valley as Significant Ecological Areas (SEAs) and establish appropriate measures for their protection.
- Minimize environment degradation by enforcing controls on pollutants (including visual pollution) and noise.
- Protect underground water supplies by enforcing controls on sources of pollutants.
- Ensure conservation of natural resources through the establishment of public programs to encourage continued agricultural production and to control energy consumption, mineral extraction, groundwater recharge, construction, and other public and private activities which affect the future availability and quality of such resources.

**Los Angeles County Zoning Ordinance**

According to the County of Los Angeles Department of Regional Planning, the land along the pipeline alignment is zoned as a combination of A-1 (Light Agriculture) at a variety of densities and A-2 (Heavy Agriculture), also at a variety of densities (Lin pers. comm.). The Los Angeles County Code lists uses that are permitted within the various zoning districts. Zoning districts A-1 and A-2 allow the following subject to a CUP:

Water reservoirs, dams, treatment plants, gauging stations, pumping stations, tanks, wells, and any use normal and appurtenant to the storage and distribution of water (County of Los Angeles, 2005, §22.24.100)

Installation of a water pipeline is not specifically prohibited in any of the above zoning districts.

## Impact Analysis

This section describes the CEQA impact analysis relating to land use and planning for the Project. It describes the approach and methods used to guide the analysis of the Project's impacts and lists the thresholds used to determine whether an impact would be considered significant.

## Methodology

Existing land use conditions were identified by examining the Kern County General Plan, the Antelope Valley Areawide General Plan, and the Los Angeles County General Plan, as well as aerial photography of the Project vicinity and information from the Los Angeles County Assessor's Office. Future planned uses for the Project vicinity were identified by examination of the Kern County and Los Angeles County General Plans, Kern County Zoning Maps, and Los Angeles County General Plan Policy Maps. The determination of impacts was made by evaluating existing and planned land uses and reviewing how each resource would be affected by implementation of the Project based on the thresholds described below. Impacts specifically relating to agriculture and Williamson Act contracts are discussed in Section 4.1, Agricultural Resources.

## Thresholds of Significance

The Kern County CEQA Implementation Document and Kern County Environmental Checklist state that a project would have a significant impact on land use and planning resources, if it would:

- physically divide an established community;
- conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect; or
- conflict with any applicable habitat conservation plan or natural community conservation plan.

## Impacts and Mitigation Measures

### Impact 4.8-1: Physically Divide an Established Community

The Project would be located in a rural area, surrounded by active agricultural lands and undeveloped/dryland grazing lands, and would not physically divide an established community near or within the Project area as no community is established in the immediate Project vicinity.

Project construction and operation would not restrict movement through or around the area because the Project does not include construction of new roads, bridges, or other common physical barriers to movement through the area.

Project construction is expected to result in minor and temporary traffic disruption along area roadways, including 170<sup>th</sup> Street and West Avenue A. It is anticipated that Project construction activities would not result in road closures or other traffic disruptions that would be considered to physically divide an established community. Further, the proposed pipelines that would be constructed would be belowground and would not restrict movement along their alignment once installed. The Project would not result in the division of an established community, and there would be no impact.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** No impact

## **Impact 4.8-2: Conflict with Any Applicable Land Use Plan, Policy, or Regulation of an Agency**

### **Kern County**

The Project area is governed by the WSSP (Kern County Department of Planning and Development Services 1992), which specifies Agricultural, Industrial, Resource Management, and Residential land uses within the Project site. Six parcels (approximately 988 acres) are not classified for Intensive Agriculture use, and a water banking project is therefore inconsistent with the Specific Plan in this regard. The Zoning Ordinance specifies Exclusive Agriculture (A) for the parcels proposed for the recharge basins, which allows, for water storage and groundwater recharge facilities. Though the construction of the water bank would be in conflict with the Specific Plan, the Project is an amendment to the Specific Plan that would redesignate these parcels as 8.1 (Intensive Agriculture), which permits uses consistent with the operation of a water bank project.

### **Los Angeles**

Most of the land in the area through which the proposed pipeline would pass is currently, and has historically been, engaged in agricultural use. Permitted and prohibited uses for agriculturally zoned properties in Los Angeles County are listed in Title 22 of the Los Angeles County Code of Ordinances. The installation of a water pipeline is not prohibited by the ordinance and can be considered to be “normal and appurtenant” to water storage and distribution (§22.24.100).

The proposed pipeline passes through several areas designated by the Los Angeles County General Plan as SEAs. These areas are defined for the purpose of preserving ecological resources and habitat areas in natural conditions. Residential, light commercial, public works projects, agriculture, and mineral extraction are allowed in SEAs if determined by a biotic survey to be compatible (County of Los Angeles Department of Regional Planning 1993). The proposed



pipeline would be underground and would pose only a temporary disturbance to local wildlife, during the period of construction. Its operation would not threaten sensitive species, and being located underground, it would pose no barrier to natural movement patterns.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

### **Impact 4.8-3: Conflict with Any Applicable Habitat Conservation Plan or Natural Community Conservation Plan**

The West Mojave Habitat Conservation Plan is being processed by Kern County and San Bernardino County with the Cities of Barstow, Lancaster, and Palmdale along with two other counties (Los Angeles and Inyo) and 12 other cities. In conjunction with a complimentary federal land use plan amendment, it presents a comprehensive strategy to conserve and protect the desert tortoise, the Mohave ground squirrel, and more than 100 other sensitive plants and animals. After approval by USFW and DFG and the issuance of a 10a and 2081 permit, a mitigation strategy will be implemented that includes a mitigation fee paid prior to grading activities that will be used for acquisition of habitat and specific activities to benefit the identified species.

As described in Section 4.3, Biological Resources, the proposed Project would not conflict with the West Mojave Plan. There would be no impact.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

## **Cumulative Impact**

Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The cumulative impact scenario for the Project includes seven specific projects identified by Kern and Los Angeles Counties, and buildout of the Kern County General Plan. A detailed description of the cumulative impact scenario considered with the proposed Project is provided in Chapter 3, "Project Description," and the project list is presented below.

A cumulative impact analysis first identifies whether a cumulatively significant impact exists in the given resource area. If so, it determines whether the project will make a considerable contribution to that impact. Where a cumulative impact is severe, even a small contribution may be considerable (Section 15130(b) of the State CEQA Guidelines).

**Table 4.8-1. Relevant Cumulative Projects**

Case Number (if applicable)	Project Name	Project Location	Approximate Distance to Project Site	Project Type	Project Description
<b>Kern County</b>					
GPA 1, Map 218	Tejon Mountain Village Specific Plan	East of I-5 in the hills north and east of Castaic Lake	14 miles northwest of project site	Major Residential/ commercial/ recreational development	3,450 single family units (s.f.u.) homes on 23,000-acre planning area,
GPA, Map 255	Lebec Canyon Estates	East of Frazier Mountain Park Road/I-5 interchange	22 miles west of project site	Residential development	32 s.f.u on 1,000 acres
SPA 8, Map 254, Amend. Zone Map 254, Zone Change 6, SP 1, Map 254, Vesting Tent. Tract 6436	Frazier Park Estates	Southern boundary of Kern Co. and portion of LA County, west of I-5 south of Frazier Mountain Park Road	24 miles west of project site	Residential / Commercial development	705 s.f.u. and 135 thousand sq. ft of commercial on 847 acres in Kern County and 323 in LA County
GPA to 5.7, Map 215	Christine Bower	One quarter mile west of 105 <sup>th</sup> Street and McConnell Road near Rosamond	3 miles north of project site	General Plan Amendment and Zone	4 s.f.u on 20- acre site
ZC to A-1, Map 231	Julien and Assoc.	8684 Sweetser Road, Rosamond (APN 315-081-09)	3-1/2 miles northeast of project site	Commercial greenhouses	60-acre site
<b>Los Angeles County</b>					
N/A	Centennial Specific Plan	1 mile east of I-5, adjacent to SR-138	12 miles southwest of project site	Large-scale new community; including residential/ commercial development	23,000 dwelling units and 14 million sq. ft. commercial on 11,700 acres
N/A	Gorman Ranch	Gorman Post Road, north of SR-138, east of I-5	17 miles southeast of project site	Residential	227 s.f.u. on 2,500 acres

## **Willow Springs Specific Plan, Kern County General Plan, and Relevant Projects**

Land use decisions are evaluated primarily on a project-by-project basis, rarely having the capability of affecting land use decisions of other projects. However, a cumulative land use impact might occur if the combination of cumulative projects would result in substantial inconsistencies with the County's General Plan, zoning, or other planning programs; result in physical division of communities; or conflict with habitat conservation plans (HCPs).

Physical division of a community generally occurs with roadway projects or some other type of linear infrastructure that would physically block passage or require other physical methods of travel. None of the projects in the area would result in this type of impact.

Several of the projects would result in inconsistencies with existing land use and zoning designations. However, as part of the respective project applications, each project includes appropriate General Plan Amendments or Zone Changes that would bring the project into conformity with the land use designations. Thus, if the appropriate land use designations are modified accordingly, the decision to allow the proposed land use is purely a discretionary policy left to the lead agency, and impacts would not occur. Such policy decisions would be on a project-by-project basis, thereby not having the potential to affect other projects.

The WSSP identifies development of commercial, industrial, and residential uses in southeast Kern County as a significant environmental effect (Kern County 1992). Although the proposed Project would require amendment of the WSSP to change various map code designations, it would be consistent with current land use and zoning and would not involve commercial, industrial, and residential uses. Therefore, the proposed Project would not contribute considerably to the significant environmental effect identified in the WSSP.

**Mitigation Measures:** No additional mitigation measures are proposed.

**Level of Significance after Mitigation:** Cumulative impacts would be less than significant.

## 4.9 Mineral Resources

### Introduction

This section describes the mineral resources present in the Project area and potential impacts of the Project on those resources, as well as the regulations that apply to such issues. This section concludes with a discussion of the potential impacts of the Project with respect to these resources.

### Environmental Setting

This section discusses the existing conditions related to mineral resources in the Project area, including both physical conditions and the regulatory framework.

### Existing Conditions

General geologic conditions in the Project area are described in Section 4.5, “Geology and Soils.”

Major production of aggregate takes place in the Palmdale area southeast of the Project area. No major production of sand or aggregate takes place in the Project area (Kohler 2002). Project area substrates are not a good source of gravel. Although some gravel is present, it constitutes only 5 to 20 percent of the substrate, which is primarily sand. The Project area could be quarried for the production of sand to mix with aggregate, but sandy gravels are generally mined for this purpose.

No other mineral resource is known or likely to occur in the Project area.

### Regulatory Framework

#### State Regulations

Mineral resource zones are designated by the California Geological Survey where access to important mineral resources may be threatened by urbanization, according to provisions of the California Surface Mining and Reclamation Act of 1975. These resources are primarily aggregate resources (sand, gravel, and rock suitable for crushing) used extensively in the construction industry. Local agencies are required to use the classification information when developing land use plans and when making land use decisions.

The portion of the Project area in Kern County is not included in any state-designated production-consumption region for sand and gravel resources;

therefore, no mineral resource zones for aggregate resources have been assigned to it. The Project area in Kern County is within an area evaluated for limestone, borates, dimension stone, silica, and gold resources, but none of the mineral resource zones established for these resources involves the Project area. An area classified as a mineral resource zone for gold lies 2 to 3 miles northeast of the Project area.

The portion of the Project area in Los Angeles County is within the Palmdale Production-Consumption Region for sand and gravel resources. However, the Project area lies north of the area where these resources are mined and substantially consumed. Accordingly, the state has not assigned any mineral resource zone classifications to the portion of the Project area in Los Angeles County (Joseph et al. 1987; Miller 1994).

## **Local Regulations**

### **Kern County General Plan**

The Kern County General Plan, adopted on June 15, 2004, contains the following goals, policy, and implementation measures concerning mineral resources.

#### ***Land Use/Conservation/Open Space Element Resource***

##### **■ Goals**

- To contain new development within an area large enough to meet generous projections of foreseeable need, but in locations that will not impair the economic strength derived from the petroleum, agriculture, rangeland, or mineral resources, or diminish the other amenities that exist in the County.
- Protect areas of important mineral, petroleum, and agricultural resource potential for future use.
- Ensure the development of resource areas minimize effects on neighboring resource lands.

##### **■ Policy**

- Emphasize conservation and development of identified mineral deposits.

##### **■ Implementation Measures**

- Use the California Geological Survey's latest maps to locate mineral deposits until the regional and statewide importance mineral deposits map has been completed, as required by the Surface Mining and Reclamation Act.
- Protect oilfields and mineral extraction areas through the use of appropriate implementing zone districts: A (Exclusive Agriculture), DI (Drilling Island), NR (Natural Resource), or PE (Petroleum Extraction).

**Willow Springs Specific Plan**

A relevant goal, policy, and mitigation/implementation measure from the WSSP are provided below.

**Resource Element****■ Goal**

- Encourage retention of productive agricultural and dormant mineral resources by imposing a restriction on allowing urban type land uses on nearby adjacent lands.

**■ Policy**

- Require review of discretionary projects in those areas designated for Resource use by the appropriate agency to determine potential resource loss.

**■ Mitigation/Implementation Measure**

- Amendment to the plan within areas presently designated Map Code 8.4 (Mineral and Petroleum—Minimum 20 Acres), which allow uses other than mineral production, may be permitted upon certification by a State of California certified geologist or mining engineer that significant mineral deposits are not present, and the proposed use would not hinder potential development of any adjacent mineral resources.

**Los Angeles County General Plan**

*The following are a relevant goal and policy from the Los Angeles County General Plan.*

**Conservation, Open Space, and Recreation  
Mineral Resources****■ Goal**

- To protect mineral resources.

**■ Policy**

- Protect and conserve existing mineral resources, evaluate the extent and value of additional deposits, and require future reclamation of depleted sites.

**Antelope Areawide General Plan**

*A relevant policy from the Antelope Valley Areawide General Plan is provided below.*

**Environmental Resource Management  
Managed Resource Production****■ Policy**

- Protect important mineral resources by a long-range approach toward mineral resource utilization.

## Impact Analysis

This section describes the CEQA impact analysis relating to mineral resources for the Project. It describes the methods used to determine the Project's impacts and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion.

## Methodology

The following assessment was developed using best professional judgment based on examination of elements of the proposed Project construction and long-term operation in relation to known mineral resources.

## Thresholds of Significance

The Kern County CEQA Implementation Document and Kern County Environmental Checklist state that a project would have a significant impact on mineral resources if it would:

- 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; or
- 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.

## Impacts and Mitigation Measures

### Impact 4.9-1: Potential Loss of Availability of Sand and Gravel Resources

As described in Section 4.9.2.1, "Existing Conditions," the Project area does not contain significant gravel resources. Sand from the Project area could possibly be used in the production of construction aggregate, but sand is widespread in the area. The Project would have no effect on the availability of sand and gravel resources. No other mineral resources are known to occur in the Project area.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** No Impact

## Cumulative Impact

Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The cumulative impact scenario for the Project includes seven specific projects identified by Kern and Los Angeles Counties, and buildout of the Kern County General Plan. A detailed description of the cumulative impact scenario considered with the proposed Project is provided in Chapter 3, “Project Description,” and the project list is presented below.

A cumulative impact analysis first identifies whether a cumulatively significant impact exists in the given resource area. If so, it determines whether the project will make a considerable contribution to that impact. Where a cumulative impact is severe, even a small contribution may be considerable (Section 15130(b) of the State CEQA Guidelines).



**Table 4.9-1. Relevant Cumulative Projects**

Case Number (if applicable)	Project Name	Project Location	Approximate Distance to Project Site	Project Type	Project Description
<b>Kern County</b>					
GPA 1, Map 218	Tejon Mountain Village Specific Plan	East of I-5 in the hills north and east of Castaic Lake	14 miles northwest of project site	Major Residential/ commercial/ recreational development	3,450 single family units (s.f.u.) homes on 23,000- acre planning area,
GPA, Map 255	Lebec Canyon Estates	East of Frazier Mountain Park Road/I-5 interchange	22 miles west of project site	Residential development	32 s.f.u on 1,000 acres
SPA 8, Map 254, Amend. Zone Map 254, Zone Change 6, SP 1, Map 254, Vesting Tent. Tract 6436	Frazier Park Estates	Southern boundary of Kern Co. and portion of LA County, west of I-5 south of Frazier Mountain Park Road	24 miles west of project site	Residential / Commercial development	705 s.f.u. and 135 thousand sq. ft of commercial on 847 acres in Kern County and 323 in LA County
GPA to 5.7, Map 215	Christine Bower	One quarter mile west of 105 <sup>th</sup> Street and McConnell Road near Rosamond	3 miles north of project site	General Plan Amendment and Zone	4 s.f.u on 20- acre site
ZC to A-1, Map 231	Julien and Assoc.	8684 Sweetser Road, Rosamond (APN 315-081- 09)	3-1/2 miles northeast of project site	Commercial greenhouses	60-acre site
<b>Los Angeles County</b>					
N/A	Centennial Specific Plan	1 mile east of I-5, adjacent to SR-138	12 miles southwest of project site	Large-scale new community; including residential/ commercial development	23,000 dwelling units and 14 million sq. ft. commercial on 11,700 acres
N/A	Gorman Ranch	Gorman Post Road, north of SR-138, east of I-5	17 miles southeast of project site	Residential	227 s.f.u. on 2,500 acres

## **Kern County General Plan and Relevant Projects**

The draft Program EIR for the Kern County General Plan Update (July 2003) (GP PEIR) does not specifically address cumulative impacts on mineral resources. The locations of mineral resources are generally well mapped and designated as Mineral Resource Zones by the Department of Conservation and recognized by the County. The placement of incompatible uses that would prevent the ultimate recovery of these resources would be considered to have a cumulative effect if occurring in multiple locations; however, mineral land use designations assist decision-makers in identifying and avoiding such conflicts.

The proposed Project would not result in the loss of availability of a known mineral resource valuable to the region or identified in a land use plan. Implementation of the Project would not result in a cumulative impact.

**Mitigation Measures:** No additional mitigation measures are proposed.

**Level of Significance after Mitigation:** Cumulative impacts would be less than significant.

## 4.10 Noise

### Introduction

This section describes the environmental setting for analyzing noise impacts, including a discussion of the relevant regulations that apply to noise. The section concludes with an analysis of the potential environmental impacts and proposed mitigation measures.

### Concepts and Terminology

The following is a brief discussion of common noise terminology and descriptors used in this report.

- **Sound:** A vibratory disturbance created by a vibrating object, which, when transmitted by pressure waves through a medium such as air, can be detected by a receiving mechanism like human ears or a microphone.
- **Noise:** Sound that is loud, unpleasant, unexpected, or otherwise undesirable.
- **Decibel (dB):** A measure of sound or vibration amplitude on a logarithmic scale that indicates the squared ratio of sound pressure or vibration velocity root-mean-squared amplitude to a reference sound pressure or vibration amplitude. For sound, the reference pressure is 20 micropascals.
- **A-weighted decibel (dBA):** An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
- **Equivalent sound level ( $L_{eq}$ ):** The equivalent steady-state sound or vibration level that would contain the same acoustical or vibration energy in a stated period of time.
- **Day-night level ( $L_{dn}$ )** is the energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring during the period from 10:00 p.m. to 7:00 a.m. A noise source that has an  $L_{eq}$  that is constant throughout a 24-hour period would have an  $L_{dn}$  that is 6 dB higher than the  $L_{eq}$ . For example, a noise source that operates is 60  $L_{eq}$  and operates 24 hours a day would have an  $L_{dn}$  of 66 dB.
- **Community noise equivalent level (CNEL)** is the energy average of the A-weighted sound levels occurring during a 24-hour period, with 5 dB added to the A-weighted sound levels occurring between 7:00 p.m. and 10:00 p.m. and 10 dB added to the A-weighted sound levels occurring between 10:00 p.m. and 7:00 a.m.

$L_{dn}$  and CNEL values rarely differ by more than 1 dB. As a matter of practice,  $L_{dn}$  and CNEL values are considered to be equivalent and are treated as such in this assessment. In general, human sound perception is such that a change in

sound level of 3 dB is just noticeable, a change of 5 dB is clearly noticeable, and a change of 10 dB is perceived as doubling or halving the sound level (Cowan 1994).

## Environmental Setting

### Existing Conditions

The Project area is located in an unincorporated area of eastern Kern County and northern Los Angeles County, about 10 miles west of the community of Rosamond and 17 miles northwest of the city of Lancaster. The Project area is rural in character with areas of agricultural and undeveloped land. Sources of noise in the area include distant traffic, wildlife, wind, agricultural activities, and aircraft noise associated with low-level military flight paths that are used to train personnel and test weapons systems.

Sensitive noise receptors in the Project area include scattered single-family residences.

### Regulatory Setting

#### Local

##### **Kern County General Plan**

The Kern County General Plan, adopted on June 15, 2004, contains the following goal, policies, and implementation measures concerning noise.

##### **Noise Element**

##### *Noise Sensitive Areas*

##### ■ **Goal**

- Ensure that residents of Kern County are protected from excessive noise and that moderate levels of noise are maintained.

##### ■ **Policies**

- Review discretionary industrial, commercial, or other noise-generating land use projects for compatibility with nearby noise-sensitive land uses.
- Require noise level criteria applied to all categories of land uses to be consistent with the recommendations of the California Division of Occupational Safety and Health (DOSH).
- Employ the best available methods of noise control.

##### ■ **Implementation Measures**

- Review discretionary development plans, programs, and proposals, including those initiated by both the public and private sectors, to

ascertain and ensure their conformance to the policies outlined in this element.

- Require proposed commercial and industrial uses or operations to be designed or arranged so that they will not subject residential or other noise sensitive land uses to exterior noise levels in excess of 65 dB  $L_{dn}$  and interior noise levels in excess of 45 dB  $L_{dn}$ .
- At the time of any discretionary approval, such as a request for a General Plan Amendment, zone change or subdivision, the developer may be required to submit an acoustical report indicating the means by which the developer proposed to comply with the noise standards. The acoustical report shall:
  - Be the responsibility of the applicant.
  - Be prepared by a qualified acoustical consultant experienced in the fields of environmental noise assessment and architectural acoustics.
  - Be subject to the review and approval of the Kern County Planning Department and the Environmental Health Services Department. All recommendations therein shall be completed with prior to final approval of the project.
- Noise analyses shall include recommended mitigation, if required, and shall:
  - Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions.
  - Include estimated noise levels for existing and projected future (10 to 20 years hence) conditions, with a comparison made to the adopted policies of the Noise Element.
  - Include recommendations for appropriate mitigation to achieve compliance with the adopted policies and standards of the Noise Element.
  - Include estimates of noise exposure after the prescribed mitigation measures have been implemented. If compliance with the adopted standards and policies of the Noise Element will not be achieved, a rationale for acceptance of the project must be provided.[E11]

### **Willow Springs Specific Plan**

Relevant goals, policies, and mitigation/implementation measures from the WSSP are provided below.

#### **Noise Element**

##### **■ Goals**

- To protect the health and welfare of Kern County residents.
- To minimize disruption to the quality of life resulting from excessive noise.

### ■ Policies

- Noise emissions from new development will be controlled and off-site levels limited to the standards of the Kern County General Plan Noise Element.
- Noise attenuation mitigation will be required of all new development within areas subject to excessive noise levels.
- Land uses will be categorized in the following manner, and the noise level standards adopted in accordance with the Kern County Noise Element:
  - Insensitive Land Uses—Noise level does not affect the successful operation of these particular activities. A wide variety of uses can be included in this category, including public utilities, transportation systems, and other noise-related uses.
  - Moderately Sensitive Land Uses—Some degree of noise control must be present if these activities are to be successfully carried out. Included here are general business and recreational uses.
  - Sensitive Uses—Lack of noise control will severely impact these uses, reducing the quality of life. This category primarily contains residential uses.
  - Highly Sensitive Uses—A high degree of noise control is necessary for the successful operation of these activities. Examples include hospitals and churches.

### ■ Mitigation/Implementation Measures

- The following standards are established, as the maximum desired ambient noise levels. Noise shall be attenuated so as not to exceed these standards.

**Figure 2.** Noise Level Standards – Willow Springs Specific Plan Update

	L <sub>50</sub> dB(A) Day	L <sub>50</sub> dB(A) Night	L <sub>dn</sub> /CNEL
Insensitive Uses	65	60	75
Moderately Sensitive Uses	60	55	70
Sensitive Land Uses	55	45	65
Highly Sensitive Land Uses	50	40	60

### Antelope Areawide General Plan

A relevant policy from the Antelope Valley Areawide General Plan is provided below.

**Noise Abatement****Land Use and Development Controls**■ **Policy**

- Use “worst case,” or highest potential noise exposure levels within the planning period as the basis of land use and development controls to prevent future noise-use incompatibilities.

## Impact Analysis

### Approach and Methodology

Potential sources of noise associated with the Project include:

- activities associated with construction of the wells, pipelines, ditches, and recharge basins;
- drilling of the recovery wells; and
- operation of the well pumps and lift stations.

Sound levels produced by these various sources are based on data from standard references, previous studies, and equipment manufacturers’ data. Projected sound levels from these sources are then estimated using a point-source attenuation model. With this model, noise from the source is assumed to attenuate at a rate of 6 dB for each doubling of distance. Additional attenuation resulting from acoustical ground absorption is also included (Federal Transit Administration 1995). To determine potential noise impacts, the distances needed for noise to attenuate to Kern County General Plan and Willow Springs Specific Plan noise-level standards of  $L_{50}$  Night 45 dBA and  $L_{50}$  Day 55 dBA as well as the  $L_{dn}$  of 65 dB are assessed for each source.

### Thresholds of Significance

The Kern County CEQA Implementation Document and Kern County Environmental Checklist state that a project would have a significant impact on noise, if it would result in:

- exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance or applicable standards of other agencies;
- exposure of persons to, or generation of, excessive ground borne vibration or ground borne noise levels;
- a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;

- a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- for a project located within the Kern County Airport Land Use Compatibility Plan, exposure of people residing or working in the project area to excessive noise levels; or
- for a project within the vicinity of a private airstrip, exposure of people residing or working in the project area to excessive noise levels.

## Impacts and Mitigation Measures

### Impact 4.10-1: Exposure of Residences to Noise from Grading and Construction Activities

Construction of the pipelines and grading to develop the recharge basins and ditches would involve the use of heavy construction equipment. Table 4.10-1 summarizes typical noise levels produced by heavy equipment.

**Table 4.10-1.** Typical Noise Levels Produced by Heavy Equipment

Equipment	Typical Noise Level (dBA) 50 Feet from Source
Backhoe	80
Dozer	85
Grader	85
Scraper	89
Truck	88

Source: Federal Transit Administration 1995.

To assess a typical reasonably foreseeable construction noise condition, a scenario in which a grader (85 dBA) and a scraper (89 dBA) operate concurrently and continuously in the same area has been assessed. The combined sound level of these two pieces of equipment would be approximately 90 dBA at a distance of 50 feet from the construction site.

Table E-1 in Appendix E indicates construction-period noise levels at various distances based on a source level of 90 dBA (measured at 50 feet). Distance attenuation and acoustical ground absorption are accounted for in the calculation (Federal Transit Administration 1995).

The results in Table E-1 indicate that noise from construction activities could exceed County noise thresholds at sensitive receptors. The distances needed for a source of this level to attenuate to County noise-level standards are:

- 2,800 feet for L<sub>50</sub> 45 dBA (nighttime standard),



- 1,200 feet for  $L_{50}$  55 dBA (daytime standard), and
- 800 feet for the 65-dBA  $L_{dn}$  standard.

This potential impact is considered significant because noise levels could exceed Kern County standards at noise-sensitive receptors.

**Mitigation Measure:**

***Mitigation Measure 4.10-1:*** If residences are present within the threshold distances determined above, the construction contractor will employ noise-reducing construction practices so that noise from construction does not exceed Kern County noise-level standards at adjacent residences. Measures to be implemented may include the following:

- providing construction equipment with sound-control devices no less effective than those provided on the original equipment (no equipment will have an unmuffled exhaust);
- restricting construction to beyond 2,800 feet from residences during nighttime hours (10 p.m. to 7 a.m.) and beyond 1,200 feet at all other times; and
- in the event that construction activities occur close to sensitive noise receptors, implementing appropriate additional noise mitigation measures, including but not limited to:
  - changing the location of stationary construction equipment,
  - shutting off idling equipment,
  - rescheduling construction activity,
  - notifying adjacent residents in advance of construction work, and
  - installing acoustic barriers around stationary construction noise sources.

**Level of Significance after Mitigation:** Less than significant.

### **Impact 4.10-2: Exposure of Residences to Noise from Well Drilling Operations**

At each well site, well drilling could involve initial drilling 24 hours a day for several days, then intermittent drilling during daytime hours for several days. The specific types of drilling units to be used are not known. Experience from previous studies indicates that a source level of 85 dBA at 50 feet is a reasonably conservative assumption for well drilling operations. The distances needed for a source of this sound level to attenuate to Kern County noise-level standards are:

- 1,800 feet for 45 dBA ( $L_{50}$  nighttime standard),
- 700 feet for 55 dBA ( $L_{50}$  daytime standard), and

- 500 feet for the 65 dB  $L_{dn}$  standard.

Although the exact locations of all Project features are not yet known, this analysis indicates that noise from drilling could exceed Kern County noise standards at noise-sensitive receptors within these distances. This potential impact is therefore considered significant.

#### **Mitigation Measure:**

***Mitigation Measure 4.10-2:*** If sensitive noise receptors are present within the threshold distances cited above, the drilling contractor will employ noise-reducing construction practices so that noise from drilling does not exceed Kern County noise-level standards at adjacent residences. Measures to be implemented may include the following:

- restricting well drilling to beyond 1,800 feet from residences during nighttime hours (10 p.m. to 7 a.m.), and 700 feet during daytime hours; or
- using sound attenuation enclosures around noise-generating elements of the drilling operation.

**Level of Significance after Mitigation:** Less than significant.

### **Impact 4.10-3: Exposure of Residences to Noise from Operation of Engines at Wells**

Well pumps may be operated by electric motors or propane engines, with horsepower that may range from 150 to 466 horsepower. For the purpose of this analysis, it was conservatively assumed that a single pump with a propane engine rating of up to 466 horsepower would be used at each wellhead. The sound level of the maximum-sized pump operated by a propane-fueled reciprocating engine was calculated using the equations for reciprocating engines from *Noise Control for Buildings, Manufacturing Plants, Equipment and Products* (Hoover and Keith 1996). Based on these calculations, a 466-horsepower propane-fueled engine would produce a sound level of 82 dBA at 50 feet. This sound level would represent the highest potential noise level from well pumping activities or the worst-case scenario at the well locations. Smaller engines would have lower sound levels, and electric engines would have considerably lower sound levels. Based on prior studies, the decibel levels produced by electric engines of similar sizes are 16 dB less than the propane-powered equivalents (Jones & Stokes 2005).

The distances needed for a source of this level to attenuate to Kern County noise-level standards are:

- 1,200 feet for  $L_{50}$  45 dBA (nighttime standard),
- 500 feet for  $L_{50}$  55 dBA (daytime standard), and
- 400 feet for the 65-dBA  $L_{dn}$  standard.

All wells would be located at least 0.25 mile apart. Accordingly, no meaningful cumulative addition of pump noise is anticipated. This analysis indicates that there is the potential for noise from well pumps with the maximum horsepower rating to exceed Kern County noise standards at residences located within 1,600 feet of a well. Therefore, this potential impact is considered significant.

**Mitigation Measure:**

**Mitigation Measure 4.10-3:** If wells are to be located within the distance and noise thresholds cited above for residences, the owner/operator will employ noise-reducing practices so that noise from well operations does not exceed Kern County noise-level standards at adjacent residences. Measures to be implemented may include:

- restricting well installations to beyond 1,600 feet from residences, where feasible;
- using electric pumps when feasible where well installations are within 1,600 feet of residences; and
- using sound attenuation enclosures designed to achieve noise reductions sufficient to comply with Kern County standards for noise-generating elements of the well operation when no other feasible control method is available.

**Level of Significance after Mitigation:** Less than significant.

#### **Impact 4.10-4: Exposure of Residences to Noise from Operation of Engines at Lift Stations**

As with wells, lift stations may be operated by electric motors or propane engines with horsepower that may range up to 5,041 horsepower. For the purpose of this evaluation, it was assumed that the largest booster pump is located at the AVEK West Feeder, operated by a propane engine with a rating of 5,041 horsepower. The calculated reference noise level and the attenuation distances are based on the use of a propane-powered pump. The calculated noise level for a 5,041-horsepower propane-powered pump is 92 dBA at 50 feet, based on assumptions and equations for reciprocating engines (Hoover and Keith 1996). In the event that an electric motor is used, reference noise levels would be substantially lower. Previous noise analysis studies have shown similarly sized electric motors to be more than 15 dB below the equivalent propane-powered engine (Jones & Stokes 2005). The attenuation distances presented below represent the worst-case attenuation distances. The distances needed to attenuate the pump noise levels to the applicable Kern County noise standards are:

- 2,800 feet for 45 dBA (nighttime standard),
- 1,200 feet for 55 dBA (daytime standard), and
- 900 feet for the 65-dBA  $L_{dn}$  standard.

This analysis indicates that, under the maximum horsepower scenario, there is potential for noise from the lift stations to exceed Kern County noise standards at residences. This potential impact is therefore considered significant.

**Mitigation Measure:**

**Mitigation Measure 4.10-4:** If the noise and distance thresholds cited above are to be exceeded, the owner/operator will employ noise-reducing practices so that noise from lift station operations does not exceed Kern County noise-level standards at adjacent residences. Measures to be implemented may include:

- restricting lift station installations to beyond 2,800 feet from residences, where feasible;
- using electric pumps where lift station installations are within 2,800 feet of residences; and
- using sound attenuation enclosures designed to achieve noise reductions sufficient to comply with Kern County standards for noise-generating elements of the lift station operation when no other feasible control method is available.

**Level of Significance after Mitigation:** Less than significant.

**IMPACT 4.10-5: Increases in Ambient Noise Levels in the Project Vicinity.**

Impacts 4.10-1 through 4.10-4 present information on the maximum noise levels expected to result from Project construction and operations. Noise impacts associated with construction would be temporary and would cease when construction is completed. Noise impacts associated with operations would be periodic because recharge and recovery activities would be periodic. When recharge and recovery activities are not taking place, normal farming practices would continue as they do today. As such, the Project would not result in a substantial permanent increase in ambient noise levels in the Project vicinity.

Ambient noise levels without the project would range from 40 to 50 dB. Based on the analysis of the noise sources associated with the proposed Project, the Project could result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the Project. This potential impact is therefore considered significant.

**Mitigation Measures:**

**Mitigation Measure 4.10- 1:** If residences are present within the threshold distances determined above, the construction contractor will employ noise-reducing construction practices, so that noise from construction does not exceed Kern County noise-level standards at adjacent residences. Measures to be implemented may include the following:

- providing construction equipment with sound-control devices no less effective than those provided on the original equipment (no equipment will have an unmuffled exhaust);
- restricting construction to beyond 2,800 feet from residences during nighttime hours (10 p.m. to 7 a.m.) and beyond 1,200 feet at all other times; and
- in the event that construction activities occur close to sensitive noise receptors, implementing appropriate additional noise mitigation measures, including but not limited to:
  - changing the location of stationary construction equipment,
  - shutting off idling equipment,
  - rescheduling construction activity,
  - notifying adjacent residents in advance of construction work, and
  - installing acoustic barriers around stationary construction noise sources.

***Mitigation Measure 4.10-2:*** If sensitive noise receptors are present within the threshold distances cited above, the drilling contractor will employ noise-reducing construction practices so that noise from drilling does not exceed Kern County noise-level standards at adjacent residences. Measures to be implemented may include the following:

- restricting well drilling to beyond 1,800 feet from residences during nighttime hours (10 p.m. to 7 a.m.), and 700 feet during daytime hours; or
- using sound attenuation enclosures around noise-generating elements of the drilling operation.

***Mitigation Measure 4.10-3:*** If wells are to be located within the distance and noise thresholds cited above for residences, the owner/operator will employ noise-reducing practices so that noise from well operations does not exceed Kern County noise-level standards at adjacent residences. Measures to be implemented may include:

- restricting well installations to beyond 1,600 feet from residences, where feasible;
- using electric pumps when feasible where well installations are within 1,600 feet of residences; and
- using sound attenuation enclosures designed to achieve noise reductions sufficient to comply with Kern County standards for noise-generating elements of the well operation when no other feasible control method is available.

***Mitigation Measure 4.10-4:*** If the noise and distance thresholds cited above are to be exceeded, the owner/operator will employ noise-reducing practices so that noise from lift station operations does not exceed Kern County noise-level standards at adjacent residences. Measures to be implemented may include:

- restricting lift station installations to beyond 2,800 feet from residences, where feasible;
- using electric pumps where lift station installations are within 2,800 feet of residences; and
- using sound attenuation enclosures designed to achieve noise reductions sufficient to comply with Kern County standards for noise-generating elements of the lift station operation when no other feasible control method is available.

**Level of Significance after Mitigation:** Less than significant.

### **IMPACT 4.10-6 Exposure of People Working or Residing in the Project Area to Excessive Noise Levels Attributable to Air Traffic from Nearby Airports or Airstrips.**

Kern County requires an evaluation of noise impacts for a project located within the Kern County Airport Land Use Compatibility Plan. There are no residential units proposed as part of the Project, so no additional residents would be exposed to excessive noise. Only 10 employees would work in the Project area (similar to the number of agricultural workers currently there), and the Project is not immediately adjacent to a public airport. The Skyotee Ranch airstrip is a private airstrip that serves small private planes on an infrequent basis. Air traffic associated with military operations in the area is similarly infrequent.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

## **Cumulative Impact**

Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The cumulative impact scenario for the Project includes seven specific projects identified by Kern and Los Angeles Counties, and buildout of the Kern County General Plan. A detailed description of the cumulative impact scenario considered with the proposed Project is provided in Chapter 3, "Project Description," and the project list is presented below.

A cumulative impact analysis first identifies whether a cumulatively significant impact exists in the given resource area. If so, it determines whether the project will make a considerable contribution to that impact. Where a cumulative impact is severe, even a small contribution may be considerable (Section 15130(b) of the State CEQA Guidelines).

**Table 4.10-2.** Relevant Cumulative Projects

Case Number (if applicable)	Project Name	Project Location	Approximate Distance to Project Site	Project Type	Project Description
<b>Kern County</b>					
GPA 1, Map 218	Tejon Mountain Village Specific Plan	East of I-5 in the hills north and east of Castaic Lake	14 miles northwest of project site	Major Residential/ commercial/ recreational development	3,450 single family units (s.f.u.) homes on 23,000-acre planning area,
GPA, Map 255	Lebec Canyon Estates	East of Frazier Mountain Park Road/I-5 interchange	22 miles west of project site	Residential development	32 s.f.u on 1,000 acres
SPA 8, Map 254, Amend. Zone Map 254, Zone Change 6, SP 1, Map 254, Vesting Tent. Tract 6436	Frazier Park Estates	Southern boundary of Kern Co. and portion of LA County, west of I-5 south of Frazier Mountain Park Road	24 miles west of project site	Residential / Commercial development	705 s.f.u. and 135 thousand sq. ft of commercial on 847 acres in Kern County and 323 in LA County
GPA to 5.7, Map 215	Christine Bower	One quarter mile west of 105 <sup>th</sup> Street and McConnell Road near Rosamond	3 miles north of project site	General Plan Amendment and Zone	4 s.f.u on 20-acre site
ZC to A-1, Map 231	Julien and Assoc.	8684 Sweetser Road, Rosamond (APN 315-081-09)	3-1/2 miles northeast of project site	Commercial greenhouses	60-acre site
<b>Los Angeles County</b>					
N/A	Centennial Specific Plan	1 mile east of I-5, adjacent to SR-138	12 miles southwest of project site	Large-scale new community; including residential/ commercial development	23,000 dwelling units and 14 million sq. ft. commercial on 11,700 acres
N/A	Gorman Ranch	Gorman Post Road, north of SR- 138, east of I-5	17 miles southeast of project site	Residential	227 s.f.u. on 2,500 acres

## Kern County General Plan

The draft Program EIR for the Kern County General Plan Update (July 2003) (GP PEIR) says the following regarding cumulative noise impacts:

Implementation of the General Plan Update is anticipated to result in a general increase in ambient noise levels within the General Plan area, including exacerbation of current noise standards and significance criteria, exceedances at numerous locations, potentially exposing existing and residential areas to noise levels greater than 65 CNEL. Following implementation of goals, policies and implementation measures contained in the General Plan Update, significant and unavoidable noise impacts would remain for roadway traffic and along railroad corridors.

This is a *significant and unavoidable* impact of the project (General Plan).

Construction of the proposed Project would require the use of heavy equipment for pipeline installation and development of the recharge basins. In addition, well drilling during construction would be a noisy activity, and operation of well motors during pumping would generate noise. The proposed Project, in conjunction with the cumulative scenario, could potentially contribute to a cumulative noise impact if mitigation measures are not imposed.

### Relevant Projects

All projects in the cumulative scenario are located several miles from the proposed Project. Although construction and traffic noise associated with these projects may be significant, the proposed Project would not contribute considerably to cumulative noise impacts because of this distance.

### Mitigation Measures:

Potential noise impacts would be minimized through the implementation of Mitigation Measures 4.10-1 (employ noise-reducing methods during well-drilling operations) and 4.10-2 and 4.10-3 (employ noise-reducing methods during well-pumping and lift-station operations).

**Level of Significance after Mitigation:** Cumulative impacts would be less than significant.



## 4.11 Population and Housing

### Introduction

This section describes the environmental and regulatory setting for population and housing, and the impacts on population and housing that would result from the proposed Project and alternatives. The Project's potential for resulting in environmental effects is examined in the context of the regulatory environment.

It was determined in the Notice of Preparation/Initial Study for the Project that no people or housing would be displaced by any of the proposed Project facilities or by the Project operation. Therefore, this environmental impact report (EIR) does not discuss this issue further.

Potential direct growth-inducing impacts are addressed below. Potential indirect growth inducing impacts are addressed in Chapter 5, "Mandatory CEQA Considerations."

### Environmental Setting

#### Existing Conditions

##### General

The Project area is located in unincorporated portions of eastern Kern County and northern Los Angeles County, about 10 miles west of the community of Rosamond and 17 miles northwest of the City of Lancaster. The Project area is rural in character with scattered homesteads and areas of agricultural and undeveloped land.

##### Kern County

Kern County covers approximately 8,202 square miles, the third largest county (in acreage) in California. According to the U.S. Census Bureau, the population of Kern County was 732,846 in 2004. In 2005, the population was recorded as 753,070, reflecting a population increase of 2.8% between 2004 and 2005 (U.S. Census Bureau 2005). There are 11 incorporated cities in Kern County; none is contiguous. The Regional Housing Allocation Plan (RHAP) generated by the Kern Council of Governments (Kern COG), stated that more than 184,000 acres of vacant residential land were identified within the unincorporated county areas that could support the development of nearly 60,000 units between 2000 and 2007. The RHAP is a housing goal for that period of time, based on estimated population increase and housing demand. The goal may or may not be met, depending on market factors. Among the nine subareas addressed under the RHAP, the Antelope Valley subarea was assigned the largest share of units, with a goal of approximately 38,000 potential units (Kern COG 2001). Table 4.11-1

describes the current and future population projections for Kern and Los Angeles Counties.

### Los Angeles County

Los Angeles County covers approximately 4,061 square miles and is the most populous county in the United States. In 2004, the U.S. Census Bureau recorded the population as 10,107,451. In 2005, the population increased by 1.2 percent to a population of 10,226,506 (U.S. Census Bureau 2005). The entire southern portion of the county is heavily urbanized.

The county contains 88 incorporated cities and many unincorporated areas. Approximately one million of the county's residents live in its unincorporated areas, which constitute roughly 65 percent of the county land area. Much of the northeastern portion of the county, adjacent to Kern County, consists of these lightly populated unincorporated areas. Currently, growth rates in Antelope Valley exceed Los Angeles County-wide growth rates. (Southern California Association of Governments [SCAG] 2004.) Much of the recent growth is attributed to the availability of open space and affordable housing in the area.

The Regional Housing Needs Assessment (RHNA) generated in 2000 by the Southern California Association of Governments (SCAG) quantifies the need for housing within each region of Los Angeles County from 1998 to 2005. The RHNA estimated that out of 46,654 housing units needed in Los Angeles County, 65 percent of them—30,174 units—were allocated to the northern part of the county, in Antelope Valley (SCAG 2000).

**Table 4.11-1. County Population Projections**

Geographic Area	January 2004 <sup>a</sup>	January 2005 <sup>a</sup>	Percent Change (2004–2005)	Projected Population 2010 <sup>b</sup>	Projected Population 2020 <sup>b</sup>
State of California	36,271,198	36,810,358	+ 1.5	39,246,767	43,851,741
Kern County	732,401	753,070	+ 2.8	808,808	950,112
Los Angeles County	10,107,451	10,226,506	+ 1.2	10,46,007	10,885,092

<sup>a</sup> Source: Census Bureau 2005  
<sup>b</sup> Source: California Department of Finance (DOF) 2005

## Regulatory Framework

### State Regulations

State law requires each city and county to adopt a general plan for its future growth. This plan must include a housing element that identifies housing needs for all economic segments and that provides opportunities for housing

development to meet those needs. At the state level, the Housing and Community Development Department (HCD) estimates the relative share of California's projected population growth that will occur in each county supported by the California Department of Finance's (DOF's) population estimates. These estimates are provided to the regional governments (e.g., Kern COG and SCAG) and are the basis for their regional housing needs allocations.

Each city and county must update its general plan housing element to address its regional housing share. Among other things, the housing element must incorporate policies and identify potential sites that will accommodate the city's share and the county's share of the regional housing need. Prior to adopting a general plan update for housing, the city or county must submit the draft to HCD for its review. HCD advises the local jurisdiction whether its housing element complies with provisions of the California Housing Element Law.

## Local Regulations

### County of Kern Housing Element, 2002–2007

The County's housing plan for addressing the identified housing needs is detailed according to the following five goals and associated policies.

- **Goal 1:** To conserve and improve the quality of existing housing and residential neighborhoods in the County.
  - **Policy 1.1** Maintain and improve the quality of residential properties by ensuring compliance with housing and property maintenance standards.
  - **Policy 1.2** Provide home improvement and rehabilitation assistance to lower and moderate income households, seniors, disabled persons, and farmworkers.
  - **Policy 1.3** Promote the repair, rehabilitation, or improvement of residential structures that are substandard or in disrepair.
  - **Policy 1.4** Continue participation in State and federal programs designed to maintain housing affordability, including Section 8, HOME, CDBG, and Rural Development.
  - **Policy 1.5** Preserve the existing stock of assisted rental housing for long term occupancy by lower income households.
- **Goal 2:** To assist in the provision of adequate housing to meet the needs of County residents. Establish a balanced approach to meeting housing needs of both owners and renters.
  - **Policy 2.1** Encourage the production of housing that meets the needs of all economic segments of the community.
  - **Policy 2.2** Provide financial and/or regulatory incentives where feasible to encourage the development of affordable housing.
  - **Policy 2.3** Participate in homeownership assistance programs to enable lower income households to purchase homes.

- ❑ **Policy 2.4** Support the provision of rental housing for large families and farmworkers.
- ❑ **Policy 2.5** Pursue State, federal, and other housing funds to leverage local funds and maximize assistance.
- **Goal 3:** To provide adequate housing sites through appropriate land use and zoning designations to accommodate the County's share of regional housing needs.
  - ❑ **Policy 3.1** Maintain an up-to-date inventory of potential sites available for future housing development, and provide the inventory to the development community.
  - ❑ **Policy 3.2** Provide adequate housing sites for special needs groups, including farmworkers, large families, homeless persons, and elderly households, through appropriate zoning designations and regulations.
- **Goal 4:** To mitigate potential governmental constraints to housing production and affordability.
  - ❑ **Policy 4.1** Offer financial and/or regulatory incentives, where feasible, to offset or reduce the costs of developing housing.
  - ❑ **Policy 4.2** Periodically review County regulations, ordinances, and residential fees to ensure that they do not unduly constrain housing development.
- **Goal 5:** To promote equal opportunity for all residents to reside in housing of their choice.
  - ❑ **Policy 5.1** Continue to support the enforcement of fair housing laws prohibiting arbitrary discrimination in the building, financing, selling, or renting of housing.
  - ❑ **Policy 5.2** Continue to financially support the provision of fair housing services to County residents.
  - ❑ **Policy 5.3** Promote housing that meets the needs of farmworkers, large families, homeless persons, persons with disabilities, and elderly households.

### **Kern County General Plan**

The Kern County General Plan, adopted June 15, 2004, contains the following policies.

#### ***Land Use/Conservation/Open Space Element***

##### ***Residential***

##### ■ **Goals**

- ❑ Guide the development of new residential uses within the County so as to ensure that the supply of land designated for residential use is extensive enough to meet anticipated demand.
- ❑ Discourage scattered urban density development within Kern County that is not supported by adequate infrastructure.

- ❑ Promote higher-density residential development within the County of Kern in areas with adequate public services and infrastructure.

- **Policies**

- ❑ Provide for an orderly outward expansion of new urban development so that it maintains continuity of existing development, allows for the incremental expansion of infrastructure and public service, minimizes impacts on natural environmental resources, and provides a high-quality environment for residents and business.

## **Kern County Ordinances**

A relevant ordinance concerning population and housing is provided below.

### **Ordinance 14.10.010**

Building permit applicant must be able to show the ability to furnish potable and adequate water supply.

Prior to issuance of a building permit to construct one (1) or more dwelling units or a permit to install or occupy one (1) or more mobile homes, the applicant shall submit to the building official evidence showing that the applicant will be able to furnish or obtain a supply of safe, pure, wholesome and potable water which is adequate in amount to supply the domestic needs and to operate the method of sewage disposal to be connected thereto, all as determined by the health officer.

### **Willows Springs Specific Plan**

The WSSP contains goals, policies, and standards that are compatible with the Kern County General Plan but are designed specifically to meet the needs of the Willow Springs area. The WSSP governs the land use in the Project area and defines land use designations consistent with those set forth in Kern County's General Plan.

- **Goal (within the Housing Element):**

- ❑ Promote an adequate supply of housing, in a range of types and prices.

### **Los Angeles County General Plan**

A relevant goal in this general plan is provided below.

- **Goal**

- ❑ Manage growth, development, and public investment in a strategic manner to sustain the livability of the region over time.

### **Antelope Valley Areawide Plan**

The Antelope Valley Areawide General Plan is a component of the Los Angeles County General Plan and sets forth the following relevant land use policies.

### ***Accommodation of Projected Land Use and Urban Growth***

#### ■ Policies

- Accommodate year 2000 population and land use demand as projected for the Antelope Valley, designating sufficient area for appropriate use and a “reasonable” excess to provide adequate flexibility.
- Closely monitor growth in the Antelope Valley to maintain a balance between development and the capacity of the environmental, economic, and manmade or social systems.

## **Impact Analysis**

This section describes the CEQA impact analysis relating to population and housing for the proposed Project and alternatives. It describes the methods used to determine the proposed Project’s impacts and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion.

As noted previously, potential direct growth-inducing impacts are addressed below. Potential indirect growth-inducing impacts are addressed in Chapter 5, “Mandatory CEQA Considerations.”

## **Methodology**

Population and housing information for the Project area was obtained from the DOF (2005) and the U.S. Census Bureau (2005). In addition, the general and specific plans for Kern and Los Angeles Counties were consulted for housing and growth projections.

The assessment of construction-related impacts involves analyzing whether the relative magnitude of temporary and permanent jobs that would be created by the Project would be large enough to require additional housing, or would otherwise spur economic growth in the area surrounding the Project.

## **Thresholds of Significance**

The Kern County CEQA Implementation Document and Kern County Environmental Checklist state that a project would have a significant impact on population or housing resources, if it would:

- induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure);

- displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere; or
- displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

## Impacts and Mitigation Measures

### Impact 4.11-1: Potential Growth-Inducing Impacts Related to Construction

Approximately 60 workers would be employed during the construction phase of the Project. The increase in population created by construction workers would be temporary, lasting for up to 6 months each year over 2 to 3 years. This increase in employment is expected to cause the population in the Project area to increase by fewer than 20 people. This increase in population would not be expected to cause housing or other economic development and, therefore, would not result in the Project being considered growth inducing.

With more than 85,000 housing units in the Antelope Valley alone (U.S. Census Bureau 2000), the increase in demand for housing attributable to the Project construction would be minimal and would not result in the Project being considered growth inducing.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

## Cumulative Impact

Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The cumulative impact scenario for the Project includes seven specific projects identified by Kern and Los Angeles Counties, and buildout of the Kern County General Plan. A detailed description of the cumulative impact scenario considered with the proposed Project is provided in Chapter 3, "Project Description," and the project list is presented below.

A cumulative impact analysis first identifies whether a cumulatively significant impact exists in the given resource area. If so, it determines whether the project will make a considerable contribution to that impact. Where a cumulative impact is severe, even a small contribution may be considerable (Section 15130(b) of the State CEQA Guidelines).

**Table 4.11-2. Relevant Cumulative Projects**

Case Number (if applicable)	Project Name	Project Location	Approximate Distance to Project Site	Project Type	Project Description
<b>Kern County</b>					
GPA 1, Map 218	Tejon Mountain Village Specific Plan	East of I-5 in the hills north and east of Castaic Lake	14 miles northwest of project site	Major Residential/commercial/recreational development	3,450 single family units (s.f.u.) homes on 23,000-acre planning area,
GPA, Map 255	Lebec Canyon Estates	East of Frazier Mountain Park Road/I-5 interchange	22 miles west of project site	Residential development	32 s.f.u on 1,000 acres
SPA 8, Map 254, Amend. Zone Map 254, Zone Change 6, SP 1, Map 254, Vesting Tent. Tract 6436	Frazier Park Estates	Southern boundary of Kern Co. and portion of LA County, west of I-5 south of Frazier Mountain Park Road	24 miles west of project site	Residential / Commercial development	705 s.f.u. and 135 thousand sq. ft of commercial on 847 acres in Kern County and 323 in LA County
GPA to 5.7, Map 215	Christine Bower	One quarter mile west of 105 <sup>th</sup> Street and McConnell Road near Rosamond	3 miles north of project site	General Plan Amendment and Zone	4 s.f.u on 20-acre site
ZC to A-1, Map 231	Julien and Assoc.	8684 Sweetser Road, Rosamond (APN 315-081-09)	3-1/2 miles northeast of project site	Commercial greenhouses	60-acre site
<b>Los Angeles County</b>					
N/A	Centennial Specific Plan	1 mile east of I-5, adjacent to SR-138	12 miles southwest of project site	Large-scale new community; including residential/commercial development	23,000 dwelling units and 14 million sq. ft. commercial on 11,700 acres
N/A	Gorman Ranch	Gorman Post Road, north of SR-138, east of I-5	17 miles southeast of project site	Residential	227 s.f.u. on 2,500 acres



## **Kern County General Plan and Relevant Projects**

All projects in the cumulative scenario would contribute to cumulative population and housing growth except for the Julien (greenhouse) project. Growth associated with buildout of the General Plan would also contribute to population and housing growth, but this growth has been approved by Kern County decision-makers and is not considered a significant cumulative impact.

The proposed Project would not result in population or housing growth. Implementation of the proposed Project is not expected to result in displacement of existing housing or population. The project is not anticipated to result in a cumulative impact on population and housing.

**Mitigation Measures:** No additional mitigation measures are proposed.

**Level of Significance after Mitigation:** Cumulative impacts would be less than significant.

## 4.12 Transportation and Traffic

### Introduction

This section describes the environmental setting for transportation and traffic, the impacts on transportation and traffic that would result from the proposed Project and alternatives, and the mitigation measures that would reduce these impacts.

### Concepts and Terminology

#### Roadway Level of Service

Level of service (LOS) measures the quality of service provided by a roadway. LOS criteria established by the Transportation Research Board are shown in Table 4.12-1. LOS criteria for roadways account for numerous variables, including annual average daily traffic, roadway capacity, grade, and environment (urban versus rural). These criteria use a letter rating to describe the peak-period driving conditions for a particular facility. The roadway traffic conditions become progressively worse from A to F.

**Table 4.12-1.** Roadway Level of Service Definitions

Level of Service Rating	Definition
A	Free flow; insignificant delays
B	Stable operations; minimal delays
C	Stable operations; acceptable delays
D	Approaching unstable; queues develop rapidly but no excessive delays
E	Unstable flow; significant delays
F	Forced flow; low operating speeds.

Source: Transportation Research Board 2002.

### Environmental Setting

This section discusses the existing conditions related to transportation and traffic in the Project area. Federal, state, and local regulations that would apply to the proposed Project are discussed in Section 4.12.4.2, “Regulatory Framework.”

The Project area lies between 170<sup>th</sup> Street to the west and 100<sup>th</sup> Street to the east. The area proposed for the recharge and recovery facilities lies between Rosamond Boulevard to the north and West Avenue A to the south. Avenue A

also marks the boundary between Kern and Los Angeles Counties. The proposed Phase 2 delivery pipeline extends from the recharge area south to the California Aqueduct. The pipeline alignment generally parallels the east side of 170<sup>th</sup> Street until that street's intersection with Lancaster Road, at which point the alignment crosses Lancaster Road and continues south to the California Aqueduct.

## Existing Conditions

### Regional

Regional access to the Project area is primarily via State Route 14, which extends north from Interstate 5 near Los Angeles, through the City of Lancaster, and into Kern County. Rosamond Boulevard, which passes just north of the Project area, provides access to the community of Rosamond and Edwards Air Force Base. State Route 138 (also referred to as West Avenue D), crosses the route of the Project's proposed pipeline in Los Angeles County and serves as a major east-west arterial for the Antelope Valley.

The area is also connected to the rest of the state through rail access. The nearest rail line to the Project site is Main Line of the Southern Pacific Railroad, which passes through Rosamond, 10 miles to the east of the Project area (Kern County Planning Department 2004).

### Local

The Project area is located in a rural agricultural setting. There are no established public transportation routes, commercial airports, transit hubs, sidewalks, or bikeways in the Project area.

Rosamond Boulevard, Avenue A, 170<sup>th</sup> Street, and 100<sup>th</sup> Street are paved, two-lane, local arterial roadways owned and maintained by Kern County. Each has a 110-foot-wide right-of-way. Locally, the Project would be accessed via Avenue A and 170<sup>th</sup> Street. Gaskell Road is owned by Kern County and paved between 100<sup>th</sup> Street and 130<sup>th</sup> Street. The new delivery pipeline is aligned parallel to 170<sup>th</sup> Street, which is paved in both Kern County and Los Angeles County.

All the paved roads in the Project area are owned and maintained by the respective counties in which they are located, with the exception of West Avenue D between 170<sup>th</sup> and 100<sup>th</sup> Streets, which aligns with State Route 138. Unpaved roads within the area proposed for the recharge and recovery facilities are privately owned. Access to the recharge site for construction and maintenance would be from 170<sup>th</sup> Street and Avenue A. As shown in Table 4.12-2, projections indicate that all Kern County roadways potentially affected by the Project are currently operating at LOS A and are operating at acceptable levels.

**Table 4.12-2. Roadway Characteristics**

Roadway	Responsibility	Functional Classification	Average (vehicles per day)	Peak Hourly	Level of Service <sup>b</sup>
West Avenue A (west of 90 <sup>th</sup> St. W.)	Kern County <sup>c</sup>	Arterial <sup>c</sup>	490 <sup>a</sup>	–	A <sup>c</sup>
Rosamond Boulevard (west of 90 <sup>th</sup> St. W.)	Kern County <sup>c</sup>	Arterial <sup>c</sup>	660 <sup>a</sup>	–	A <sup>c</sup>
100 <sup>th</sup> Street W. (north of W. Ave. A)	Kern County <sup>c</sup>	Arterial <sup>c</sup>	130 <sup>a</sup>	–	A <sup>c</sup>
170 <sup>th</sup> Street W. (north of W. Ave. A)	Kern County <sup>c</sup>	Arterial <sup>c</sup>	130 <sup>a</sup>	–	A <sup>c</sup>
170 <sup>th</sup> Street W. (south of W. Ave. A)	Los Angeles County	Secondary Rural <sup>d</sup>	–	–	–
Lancaster Road (east of 170 <sup>th</sup> Street W)	Los Angeles County	Limited Secondary Rural <sup>d</sup>	–	–	–
SR-138 (West Ave. D)	California Department of Transportation	State Highway	4,300 <sup>e</sup>	450 <sup>e</sup>	–

<sup>a</sup> Data is from 2004 traffic counts. Source: Kern County Roads Department.

<sup>b</sup> Levels of service are defined in Table 4.12-1.

<sup>c</sup> Source: Nienke pers. comm.

<sup>d</sup> Source: Tong pers. comm.

<sup>e</sup> Data is from 2004 traffic counts. Source: California Department of Transportation.

## Regulatory Framework

### Federal Regulations

There are no federal regulations that are applicable to traffic in the Project vicinity.

### State Regulations

Under Sections 660–672 of the California Streets and Highways Code, permits would be required from Caltrans for portions of the Project that encroach on California Department of Transportation rights-of-way.

### Local Regulations

#### Kern County General Plan

Under Title 12.16 of the Kern County Code, permits would be required for portions of the Project that encroach on improved roadways in Kern County.

The Circulation Element of the Kern County General Plan (Kern County Planning Department 2004) sets a countywide goal of maintaining a Level of Service Standard on county roads of LOS D.

### **Willow Springs Specific Plan Circulation Element**

The Willow Springs Specific Plan circulation element designates all section lines as arterial highways. Arterial highways are 110-foot-wide County routes designed to carry a high volume of traffic. When constructed to its ultimate standard, it is typically two lanes of traffic and a parking lane in each direction, separated by a wide median. Mid-section lines are designated as collector highways. The right-of-way width of collectors is typically 90 feet, with a cross section showing two travel lanes and a parking lane each way with no median.

In addition, the Willow Springs Specific Plan (Kern County Planning Department 1992) contains the following relevant goals and policy:

#### ■ **Goals:**

- To maintain adequate traffic safety.
- To reduce potential traffic impacts to adjacent jurisdictions, such as Los Angeles County.
- To provide an adequate circulation system which will support the proposed land uses.

#### ■ **Policy:**

10. At such time as the area within the plan supports a population of 35,000, the County shall reevaluate the plan. Adjustments and amendments shall be made as warranted to ensure a Level of Service (LOS) "C" or better.

### **Los Angeles County General Plan**

Under Title 16.18 of the Los Angeles County Code, permits would be required for portions of the Project that encroach on improved roadways in Kern County.

### **Antelope Valley Areawide General Plan**

Lancaster Road and 170<sup>th</sup> Street are designated as limited secondary rural roadway and secondary rural roadway, respectively. Both 170<sup>th</sup> Street and Lancaster Road east of 170<sup>th</sup> Street have 100-foot-wide rights-of-way (Tong pers. comm.). The Antelope Valley Areawide General Plan (County of Los Angeles Department of Regional Planning 1986) contains the following relevant policy regarding transportation and traffic.

#### **Circulation**

##### *Rural Circulation*

#### ■ **Policy**

- Implement an arterial network that will adequately serve the rural farm-to-market, recreational, emergency, and circulation needs of Antelope Valley rural residents.

## Impact Analysis

This section describes the CEQA impact analysis relating to transportation and traffic for the proposed Project. It describes the methods used to determine the proposed Project's impacts and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion.

## Methodology

Information for this analysis was primarily taken from the Kern County General Plan Circulation Element, the Antelope Valley Areawide General Plan, traffic studies conducted by the Kern County Roads Department, and personal communications with the Kern County Roads Department and the County of Los Angeles Department of Public Works. The discussion focuses on the four roads immediately surrounding the recharge and recovery area in Kern County, as this area will require the heaviest equipment and generate the greatest increase in traffic during construction. The Phase 2 delivery pipeline route into Los Angeles County travels through mostly undeveloped land, though it does cross SR-138 (West Avenue D).

The following section describes the methods used to assess transportation and traffic impacts associated with the Project. As described under Existing Conditions above, recent traffic counts are used to provide traffic data for roadways in the Project vicinity. Consequently, these traffic data are used to characterize the baseline traffic condition for this transportation and traffic analysis.

## Trip Generation

To assess the magnitude and directional variation of vehicle trips associated with construction of the Project, vehicle-trip generation was analyzed using an estimate of the required construction-related workforce. Assuming a worst-case scenario, construction of the Project could require up to 60 construction workers. Implementation of the Project could generate up to 3,600 heavy-truck trips during construction of the recharge basins. Table 4.12-3 provides an estimate of the total number of construction-related vehicle trips that would be generated by the Project, including the peak and average daily vehicle trips.

The transportation and traffic analysis also assumes a worst-case scenario in which each of the 60 workers would drive a separate vehicle to the Project site, making two trips per day, or one round-trip from home to the site and back. Under this scenario, construction of the Project would result in an average of approximately 176 vehicle trips per day and about 68 total vehicle trips per day during each of the peak morning and afternoon traffic periods (Table 4.12-3).

In addition, it is estimated that construction-related activities would include the use of several types of equipment, including backhoes, scrapers, water trucks, pickup trucks, and front loaders. It is assumed that equipment would be stored onsite while in use and would not result in a substantial increase in the overall daily Project trip generation.

During non-operational periods, the site would be farmed in a fashion similar to current operations, with farm traffic similar to current conditions. There would be periodic care-taker visits to wells, lift stations and other facilities to perform routine inspections, monitoring, maintenance, exercising of valves, monitoring and turning over of motors and engines. During recharge and recovery periods, there would be a full-time staff, likely less than 10-people, present to regulate flows, monitor conditions, and maintain ditches/berms. This staffing is significantly less than that required for current farming operations. Therefore, operations and maintenance-related activities would not affect the operating conditions of existing roadways. Consequently, operations-related traffic is not addressed further in this analysis.

**Table 4.12-3. Construction Vehicle Trip Generation and Workforce Distribution**

Vehicle Origin City	% Distribution of Local Workforce	Daily Workforce	Daily Vehicle Trips <sup>a</sup>	Daily Peak-Hour Vehicle Trips <sup>a, b</sup>
Antelope Valley				
Construction Workers	75 <sup>c</sup>	45 <sup>d</sup>	90	45
Heavy Trucks	75 <sup>c</sup>	21 <sup>d</sup>	42	6
Bakersfield				
Construction Workers	25	15	30	15
Heavy Trucks	25	7	14	2
<b>Total</b>	<b>100</b>	<b>88</b>	<b>176</b>	<b>68</b>

<sup>a</sup> Vehicles and trucks accessing the Project site generate two daily trips (one inbound and one outbound).

<sup>b</sup> Peak-hour trip generation is based on 50% of the resultant daily passenger-vehicle generation and 15% of the daily heavy-truck generation.

<sup>c</sup> The transportation and traffic analysis assumes that 75% of the construction workers and heavy-truck trips would originate from the Antelope Valley area; the remaining 25% would originate from Bakersfield.

<sup>d</sup> Estimated daily workforce includes 100% of the construction workers and an estimate of the average daily number of heavy-truck trips generated by the Project.

## Thresholds of Significance

The Kern County CEQA Implementation Document and Kern County Environmental Checklist state that a project would have a significant impact on transportation resources or traffic, if it would:

- cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections);
- exceed, either individually or cumulatively, a Level of Service standard established by the county congestion management agency or adopted County threshold for designated roads or highways;
- result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- result in inadequate emergency access; or
- result in inadequate parking capacity.

## Impacts and Mitigation Measures

### **Impact 4.12-1: Cause an Increase in Traffic That is Substantial in Relation to the Existing Traffic Load and Street System Capacity**

The Project proposes no permanent population increase in the immediate area, nor would the Project provide permanent employment for a substantial number of workers during operations. However, Project construction would require the presence of construction workers, along with heavy trucks and equipment used for excavation of the site. This would generate up to an estimated 176 daily vehicle trips on local roads until construction is completed. While substantial relative to the volume of traffic loads, the increase would be temporary and would not be substantial enough to change the current LOS A rating for the roads. This potential impact is less than significant.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

### **Impact 4.12-2: Exceed a Level of Service Standard Established by the County**

Kern County currently requires a LOS rating of D in order for a road to be in compliance with the Circulation Element of the County's General Plan and LOS rating of C for compliance with the Circulation Element of the Willow Springs Specific Plan. Currently, all the roads surrounding the Kern County portion of the Project are operating at LOS ratings of A, primarily due to the extremely low level of traffic (see Table 4.12-2 for traffic counts). According to the Kern County Roads Department, several thousand vehicles would have to be added to



the average daily count to cause the Level of Service on these roads to drop below LOS standards. As the Project would not generate increased traffic on that scale, even during construction, this potential impact is less than significant.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant.

### **Impact 4.12-3: Result in a Change in Air Traffic Patterns, Including an Increase in Traffic Volume or Change in Location that Results in Substantial Safety Risks**

The Project does not propose the alteration of any air traffic patterns, nor does it include the construction of any structures or design features that are considered a direct hazard to air navigation. There would be no impact.

Potential bird air strike hazards are addressed in Section 4.8, "Land Use and Planning."

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** No impact.

### **Impact 4.12-4: Substantially Increase Hazards Attributable to a Design Feature or Incompatible Use**

The Project does not propose any changes to existing roads that would constitute a traffic hazard. Heavy equipment traffic, however, could create conditions that would be incompatible with general purpose traffic in the area. This potential impact would be significant.

**Mitigation Measure:**

**Mitigation Measure 4.12-1:** The owner/operator will require the construction contractor to prepare and implement a traffic safety plan before the onset of the construction phase of the Project. The traffic safety plan shall be reviewed and approved by the Kern County Roads Department for affected roads in Kern County and the Los Angeles County Public Works Department for affected roads in Los Angeles County. The plan shall address:

- appropriate vehicle size and speed,
- travel routes,
- detour or lane-closure plans,
- flagperson requirements,
- locations of turnouts to be constructed,

- coordination with law enforcement and fire control agencies,
- coordination with California Department of Transportation personnel (for work affecting state road rights-of-way),
- emergency access to ensure public safety, and
- traffic and speed limit signs.

**Level of Significance after Mitigation:** Less than significant.

### **Impact 4.12-5: Result in Inadequate Emergency Access**

During the construction phase of the Project, slow-moving traffic in the area could affect emergency response times on roads in the Project vicinity. Additionally, temporary road closures or detours would be required where proposed pipeline alignments cross roadways. This potential impact would be significant.

**Mitigation Measure:**

***Mitigation Measure 4.12-2:*** Before beginning construction activities, the applicant or the construction contractor shall contact local emergency-response agencies (Kern County and Los Angeles County Sheriff and Fire Departments) to provide information on the timing and location of any traffic control measures required to complete the Project. Emergency-response agencies would be notified of any change to traffic control measures as the construction phases proceed, so that emergency-response providers can modify their response routes to ensure that response time would not be affected.

**Level of Significance after Mitigation:** Less than significant.

### **Impact 4.12-6: Result in Inadequate Parking Capacity**

The Project would require parking for approximately less than 10 employees during operations. Existing parking areas would be adequate. During construction, equipment staging areas and commuter parking areas would be located on private property and would not encroach on roadways.

**Mitigation Measure:**

***Mitigation Measure 4.12-3:*** Prior to issuance of a grading permit, the applicant shall submit a plot plan detailing the location of buildings to be used for operational staff. The plan shall have a minimum of 10 parking spaces and shall comply with Chapter 19.82 (Off-Street Parking) of the Kern County Zoning Ordinance.

**Level of Significance after Mitigation:** No impact

### **Impact 4.12-7: Conflict with Adopted Policies, Plans, or Programs Supporting Alternative Transportation (e.g., Bus Turnouts, Bicycle Racks)**

The Project is neither a residential nor employment-generating land use, and there is no need for alternative transportation facilities. There are no pedestrian walkways, bikeways, or roads designated as bike routes that could be potentially affected by Project construction. Additionally, while plans for the area support the expansion of alternative transportation, the area is sparsely populated, and alternative means of transportation have not developed in the Project vicinity. The Project would also not preclude the expansion of alternative transportation in the area at some future date. There would be no impact.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** No impact

## **Cumulative Impact**

Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The cumulative impact scenario for the Project includes seven specific projects identified by Kern and Los Angeles Counties, and buildout of the Kern County General Plan. A detailed description of the cumulative impact scenario considered with the proposed Project is provided in Chapter 3, "Project Description," and the project list is presented below.

A cumulative impact analysis first identifies whether a cumulatively significant impact exists in the given resource area. If so, it determines whether the project will make a considerable contribution to that impact. Where a cumulative impact is severe, even a small contribution may be considerable (Section 15130(b) of the State CEQA Guidelines).

**Table 4.12-4. Relevant Cumulative Projects**

Case Number (if applicable)	Project Name	Project Location	Approximate Distance to Project Site	Project Type	Project Description
<b>Kern County</b>					
GPA 1, Map 218	Tejon Mountain Village Specific Plan	East of I-5 in the hills north and east of Castaic Lake	14 miles northwest of project site	Major Residential/ commercial/ recreational development	3,450 single family units (s.f.u.) homes on 23,000-acre planning area,
GPA, Map 255	Lebec Canyon Estates	East of Frazier Mountain Park Road/I-5 interchange	22 miles west of project site	Residential development	32 s.f.u on 1,000 acres
SPA 8, Map 254, Amend. Zone Map 254, Zone Change 6, SP 1, Map 254, Vesting Tent. Tract 6436	Frazier Park Estates	Southern boundary of Kern Co. and portion of LA County, west of I-5 south of Frazier Mountain Park Road	24 miles west of project site	Residential / Commercial development	705 s.f.u. and 135 thousand sq. ft of commercial on 847 acres in Kern County and 323 in LA County
GPA to 5.7, Map 215	Christine Bower	One quarter mile west of 105 <sup>th</sup> Street and McConnell Road near Rosamond	3 miles north of project site	General Plan Amendment and Zone	4 s.f.u on 20- acre site
ZC to A-1, Map 231	Julien and Assoc.	8684 Sweetser Road, Rosamond (APN 315-081-09)	3-1/2 miles northeast of project site	Commercial greenhouses	60-acre site
<b>Los Angeles County</b>					
N/A	Centennial Specific Plan	1 mile east of I-5, adjacent to SR-138	12 miles southwest of project site	Large-scale new community; including residential/ commercial development	23,000 dwelling units and 14 million sq. ft. commercial on 11,700 acres
N/A	Gorman Ranch	Gorman Post Road, north of SR-138, east of I-5	17 miles southeast of project site	Residential	227 s.f.u. on 2,500 acres

## Kern County General Plan and Relevant Projects

Growth and development associated with buildout of the Kern County General Plan would result in substantial increases in traffic; however, decision-makers have approved this growth, and transportation planning to accommodate this growth should be conducted concurrently with this growth. The large projects in the cumulative scenario in both Kern and Los Angeles Counties would add to increased traffic conditions but will also require land use entitlements and associated transportation improvements.

Projections of future traffic conditions incorporate regional population and employment growth that is expected to occur by the future analysis year, independent of the proposed Project. Because of this, future condition scenarios *without the proposed Project* capture the effects of cumulative projects. Future condition scenarios *with the proposed Project* capture the effects of both cumulative projects and those of the proposed Project.

Construction and operation of the proposed Project would not result in a cumulative impact on traffic. Project construction would not cause a substantial increase in traffic or exceed existing levels of service. Heavy equipment traffic could create conditions incompatible with general-purpose traffic and potentially interfere with emergency response vehicles; however, these effects would be temporary and mitigated. These effects could be cumulatively significant when considered in conjunction with other projects in the area. However, the two small projects in the cumulative scenario would not be large traffic generators. The large projects (Tejon Mountain Village Specific Plan, Centennial) in the cumulative scenario would contribute to a cumulative traffic impact; however, they are located more than 10 miles away and would not use the same roadways as the proposed Project. Therefore, the traffic impacts of the Project would not contribute considerably to cumulative traffic impacts. Mitigation to avoid any impairment of emergency response vehicles during construction is provided to avoid any potential Project impact.

### **Mitigation Measures:**

Mitigation Measures 4.12-1 (develop and implement a traffic safety plan) and 4.12-2 (notify emergency response agencies of proposed traffic-route changes) would minimize project impacts and therefore reduce the potential for a significant cumulative effect.

**Level of Significance after Mitigation:** Cumulative impacts would be less than significant.

## 4.13 Utilities and Service Systems

### Introduction

This section describes the environmental setting for utilities and service systems, the impacts on utilities and service systems that would result from the proposed Project, and any mitigation measures that would reduce significant impacts.

### Environmental Setting

This section discusses the existing conditions related to utilities and service systems in the Project area. Federal, state, and local regulations related to utilities and service systems that apply to the proposed Project are discussed under Regulatory Framework.

### Existing Conditions

The Project site is not currently served by public wastewater or stormwater facilities, and no schools are located within the immediate vicinity of the Project area. Therefore, these services and facilities are not discussed further here.

#### Water Service

According to the WSSP, private groundwater wells provide drinking water in the area. The AVEK West Feeder pipeline, which runs along Gaskell Road, provides imported SWP surface water for irrigation. The low availability of water for both agricultural and domestic purposes has historically been a primary factor in keeping the area undeveloped (Kern County Planning Department 1992).

Similarly, public water service is not available to the portion of the Project in northern Los Angeles County (Los Angeles County Department of Public Works 2005). Water is procured (i.e., trucked in) from local water purveyors or pumped from privately owned groundwater wells.

#### Waste Disposal

Currently, no sewer lines exist in the Project area; local residents rely on septic systems.

The Mojave-Rosamond Landfill is the closest landfill to the recharge and recovery facilities and is located approximately 17 miles northeast of the Project (Kern County Waste Management Department 2005).

## Regulatory Framework

### Local Regulations

The following sections describe local plans, goals, implementation measures, and policies applicable to the Project site and environs.

#### **Kern County General Plan**

The Kern County General Plan, adopted June 15, 2004, contains the following policies with regard to utilities and service systems.

#### ***Land Use/Open Space/Conservation Element***

##### ***Public Facilities and Services***

###### ■ **Goal**

- Provide a healthful and sanitary means of collecting, treating, and disposing of sewage and refuse for the residents and industries of Kern County.

###### ■ **Implementation Measure**

- Project developers shall coordinate with the local utility service providers to supply adequate public utility services.

###### ■ **Policies**

- All methods of sewage disposal and water supply shall meet the requirements of the Kern County Environmental Health Services Department and the California Regional Water Quality Control Board. The Environmental Health Department shall periodically review and modify, as necessary, its requirements for sewage disposal and water supply, and shall comply with any new standards adopted by the State for implementation of Government Code Division 7 of the Water Code, Chapter 4.5 (Section 13290-1329.7). (Assembly Bill 885) (2000).
- Prior to approval of any discretionary permit, the County shall make the finding, based on information provided by California Environmental Quality Act documents, staff analysis, and the applicant, that adequate public or private services and resources are available to serve the proposed development.

#### **Willow Springs Specific Plan**

The WSSP lists the following relevant goal and policy with regard to utilities and service systems surrounding the recharge area:

**Public Facilities Element****■ Goal**

- Based on the potential populations for Willow Springs, Rosamond, Joshua Heights, and surrounding areas, a sanitary landfill will be needed at some future time. A potential landfill site should be located on a site where the lack of utilities would act as a buffer to limit future residential land division.

**■ Policy**

- The projects shall comply with all applicable Kern County code and ordinance requirements for construction, access, water mains, fire flows, and fire hydrants.

**Los Angeles County General Plan**

The Los Angeles County General Plan establishes the following relevant goals and policies with regard to utilities and service systems.

**Public Facilities Element***Mitigation***■ Goal**

- Mitigation of hazards and elimination of adverse impacts in providing water and waste services.

**■ Policy**

- Program water and sewer services extensions to be consistent with General Plan policies and to mitigate situations that pose immediate health and safety hazards.

*Protection***■ Goal**

- To protect the health and safety and welfare of all residents in providing water and waste services.

**■ Policy**

- Design water and waste management systems which enhance the appearance of the neighborhoods in which they are located and minimize negative environmental impacts.

*Improvements to the Systems***■ Goal**

- Improved systems of resource use, recovery, and reuse.

**■ Policy**

- Increase storage of potable water in underground aquifers through greater use of spreading grounds.



**Quality Water****■ Goal**

- A high quality of coastal, surface and ground waters.

**■ Policies**

- Protect public health and prevent pollution of ground water through the use of whatever alternative is necessary.
- Provide protection to ensure water quality and quantity.
- Avoid or mitigate threats to pollution of the ocean, drainage ways, lakes, and ground water reserves.

**Antelope Valley Areawide General Plan**

The Antelope Valley Areawide General Plan, which is a component of the Los Angeles County General Plan, sets the following relevant policies regarding utilities and service systems.

**Adequacy of Public Services****■ Policy**

- Encourage development of services to meet the needs of Antelope Valley residents including health, education, welfare, police and fire, governmental operations, recreation, cultural, and governmental operations, recreation, cultural, and utility services. Such services should be expanded at a rate commensurate with population growth.

**Water Supply and Distribution****■ Policy**

- Encourage utilization of floodwaters and reclaimed wastewater for groundwater recharge.

**Flood Control****■ Policy**

- Identify planned flow paths and groundwater recharge preserves on the Antelope Valley Comprehensive Plan of Flood Control and Water Conservation for the primary water course and for conservation of storm runoff in the rural areas.

## Impact Analysis

This section describes the CEQA impact analysis relating to utilities and service systems for the proposed Project. It describes the methods used to determine the proposed Project's impacts and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion.

## Methodology

The analysis of impacts on utilities and service systems includes a qualitative assessment of the Project's effect on utilities and service systems.

## Thresholds of Significance

The Kern County CEQA Implementation Document and Kern County Environmental Checklist establish the following thresholds to determine whether a project would have a significant impact on utilities and services systems.

Would the project:

- exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?
- require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?
- require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?
- have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?
- result in a determination by the wastewater treatment provider 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?
- be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?
- comply with federal, state, and local statutes and regulations related to solid waste?

## Impacts and Mitigation Measures

The Project would not increase demand for utilities and service systems such as wastewater treatment or stormwater drainage. Solid waste is not discussed below because construction and operation of the Project would not increase the disposal requirements above those associated with current land uses. Growth-inducing impacts are discussed in Chapter 5, "Mandatory CEQA Sections."

The Project could have the following potential impact on existing utilities and service systems.

### **Impact 4.13-1: Temporary Disruption of AVEK West Feeder as a Result of Construction or Operation**

As proposed, imported surface water from the California Aqueduct would be delivered to and from the Project via the AVEK West Feeder pipeline during Phase 1. Phase 1 construction would require potential disruptions of service when lift stations or tie-ins are installed. Phase 1 operations would require permission from and coordination with AVEK to use conveyance capacity in the West Feeder. AVEK would continue to control this pipeline; therefore, the potential disruption of the AVEK West Feeder operations would be a less-than-significant impact because AVEK would ensure that required levels of service are maintained before allowing construction associated with their facilities and before making conveyance capacity available to the Project.

Finally, all of the operations summarized above would entail conveyance of existing SWP entitlements through the California Aqueduct. These operations would be performed in accordance with the rights and restrictions placed on Project participants that hold SWP entitlements as implemented and constrained by existing DWR policies and operational procedures.

**Mitigation Measures:** No additional mitigation is proposed.

**Level of Significance after Mitigation:** Less than significant

## **Cumulative Impact**

Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The cumulative impact scenario for the Project includes seven specific projects identified by Kern and Los Angeles Counties, and buildout of the Kern County General Plan. A detailed description of the cumulative impact scenario considered with the proposed Project is provided in Chapter 3, "Project Description," and the project list is presented below.

A cumulative impact analysis first identifies whether a cumulatively significant impact exists in the given resource area. If so, it determines whether the project will make a considerable contribution to that impact. Where a cumulative impact is severe, even a small contribution may be considerable (Section 15130(b) of the State CEQA Guidelines).

**Table 4.13-1. Relevant Cumulative Projects**

Case Number (if applicable)	Project Name	Project Location	Approximate Distance to Project Site	Project Type	Project Description
<b>Kern County</b>					
GPA 1, Map 218	Tejon Mountain Village Specific Plan	East of I-5 in the hills north and east of Castaic Lake	14 miles northwest of project site	Major Residential/commercial/recreational development	3,450 single family units (s.f.u.) homes on 23,000-acre planning area,
GPA, Map 255	Lebec Canyon Estates	East of Frazier Mountain Park Road/I-5 interchange	22 miles west of project site	Residential development	32 s.f.u on 1,000 acres
SPA 8, Map 254, Amend. Zone Map 254, Zone Change 6, SP 1, Map 254, Vesting Tent. Tract 6436	Frazier Park Estates	Southern boundary of Kern Co. and portion of LA County, west of I-5 south of Frazier Mountain Park Road	24 miles west of project site	Residential / Commercial development	705 s.f.u. and 135 thousand sq. ft of commercial on 847 acres in Kern County and 323 in LA County
GPA to 5.7, Map 215	Christine Bower	One quarter mile west of 105 <sup>th</sup> Street and McConnell Road near Rosamond	3 miles north of project site	General Plan Amendment and Zone	4 s.f.u on 20-acre site
ZC to A-1, Map 231	Julien and Assoc.	8684 Sweetser Road, Rosamond (APN 315-081-09)	3-1/2 miles northeast of project site	Commercial greenhouses	60-acre site
<b>Los Angeles County</b>					
N/A	Centennial Specific Plan	1 mile east of I-5, adjacent to SR-138	12 miles southwest of project site	Large-scale new community; including residential/commercial development	23,000 dwelling units and 14 million sq. ft. commercial on 11,700 acres
N/A	Gorman Ranch	Gorman Post Road, north of SR-138, east of I-5	17 miles southeast of project site	Residential	227 s.f.u. on 2,500 acres

## **Kern County General Plan and Relevant Projects**

Projects included in the cumulative scenario would affect utilities and service systems in both Kern and Los Angeles Counties. This growth and development, however, will be considered and approved by decision-makers and will include the provision of appropriate utility and service systems. The small local projects (Bowen and Julien) will not contribute to these effects.

Frazier Park Estates could generate impacts on public services, including fire, police, schools, and parks, with new development or upon buildout of 705 homes. This project includes mitigation to minimize its contribution to cumulative impacts.

The Tejon Mountain Village Specific Plan involves a residential/ commercial development of approximately 3,450 homes and 160,000 square feet of commercial space. This project would generate impacts on public services, including fire, police, schools, and parks, with new development or upon buildout. This project includes mitigation to minimize its contribution to cumulative impacts.

The Lebec Canyon Estates project involves development of approximately 32 single-family homes on 1,000 acres. The GPA, Map 255 project would generate impacts on public services, including fire, police, schools, and parks, with new development or upon buildout. The Lebec Canyon Estates project will be required to mitigate its impacts on public services; therefore, the contribution from this cumulative project would not be cumulatively considerable.

The Centennial Specific Plan project in Los Angeles County involves development of a large-scale new community consisting of approximately 23,000 dwelling units and 14 million square feet of commercial space. This project would generate impacts on public services, including fire, police, schools, and parks, with new development or upon buildout. However, most of the service providers would not be the same as those required for the proposed Project, because the Centennial Specific Plan project is located in Los Angeles County, and within different jurisdictions for each of the service agencies.

The Gorman Post Road Development involves the development of 227 single-family residential units located at the terminus of Gorman Post Road, north of State Route 138, east of I-5, and southeast of the proposed Project site. The Gorman Post Road Development project would generate impacts on public services, including fire, police, schools, and parks, with new development or upon buildout.

In combination, the cumulative projects would generate impacts on public services, including fire, police, schools, and parks, with new development or upon buildout that could potentially be significant individually and/or cumulatively. The proposed Project would not result in an impact on any utility or service systems that serve the large development projects. It will not increase

the demand for, or ability to provide, any utility or service and therefore will not contribute to cumulative impacts.

**Mitigation Measures:** No additional mitigation measures are proposed.

**Level of Significance after Mitigation:** Cumulative impacts would be less than significant.