6. Development of the Tehachapi Wind Resource Area

Chapter 6 addresses the development of the Tehachapi Wind Resource Area (TWRA). Section 6.1 provides an introduction and background on the TWRA. Section 6.2 addresses wind development in the TWRA and the associated elements of construction and operation of wind turbines. Sections 6.4 through 6.19 address the environmental setting; applicable rules, regulations, and standards; and impacts related to the construction and operation of future wind development in the TWRA, including the proposed Alta-Oak Creek Mojave Project. Section 6.20 provides a summary of impacts and mitigation measures related to future wind development in the TWRA. Appendix E provides a summary of the PdV Wind Energy Project.

6.1 Introduction

The TWRA is considered the largest wind resource area in California and is situated at the southern end of the San Joaquin Valley and spreads into the adjacent Mojave Desert. The diverse land within the TWRA ranges from high desert floor to mountain pass, to tall mountains. Elevation ranges from 2,500 feet to approximately 8,000 feet above sea level.

Wind power plants in this area are responsible for over 40 percent of California's wind energy generation and produce more power than any other wind development in the United States. In the Tehachapi/Mojave area, most of the existing 3,400 wind turbines that produce about 710 megawatts (MW) of power are located in the TWRA. Most of the wind resource area's existing turbines were installed between 1981 and 1986. Between 1986 and 1989, about another 100 MW were developed. Between 1990 and 2000, very few additional wind turbines were installed. During the late 1990s, wind power plant owners started repowering their existing turbines by removing the older turbines and replacing them with newer models.

The intent of this analysis is to present the potential impacts and mitigation, on a programmatic level, for the development of wind generation projects within the TWRA. This chapter addresses impacts from the TWRA to disclose the reasonably foreseeable environmental impacts from wind development that would arise as a result of the Tehachapi Renewable Transmission Project (TRTP). As presented in Section 6.2.2, a study area was established using the Kern County zoning ordinance, the locations of existing transmission systems and wind farms, the California Energy Commission (CEC) annual wind power density map, land uses and flight restriction zones in the area, and assistance from Kern County. Utilizing the developed study area, a programmatic analysis was then conducted for wind development within the TWRA boundary using the Kern County Significance Criteria, the Kern County General Plan, and information from existing and proposed wind farms in the area (see Section 6.2.2). The programmatic analysis is based on reasoned assumptions (assumptions were developed based on proposed wind farms in the TWRA) that constitute a scenario of future activities developed for future buildout of the TWRA.

Approval of the TRTP or an alternative would not result in approval of any specific wind generation project. Any and all future wind generation projects would be subject to separate environmental review, as discussed below in Section 6.1.3. The projects are evaluated in this Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) purely for the benefit of decisionmakers and the public.

The remainder of this section presents background information on transmission capacity for the future wind development and the regulatory framework set in place by Kern County.

6.1.1 Transmission for Future Wind Development

This report analyzes the effects of the potential development of the TWRA indicating, as precisely as possible, the size, timing, and location of wind development projects necessary to achieve an estimated capacity of 4,500 MW (CPUC, 2006). The TRTP is a plan to provide the electrical facilities necessary to reliably interconnect and integrate up to 3,800 MW of new wind generation in the TWRA currently being planned or expected in the future. It also addresses the reliability needs of the California Independent System Operator (CAISO)-controlled grid due to projected load growth in the Antelope Valley and the South of Lugo transmission constraints, an ongoing source of concern for the Los Angeles Basin.

The TRTP consists of eight segments enumerated as Segments 4 through 11. Proposed Segments 4, 5, and 10 would involve upgrading and expanding Southern California Edison's (SCE) transmission system north of SCE's Vincent Substation in order to integrate TWRA wind generation to SCE's electric system. Proposed Segments 6, 7, 8, and 11 would involve upgrading and expanding SCE's transmission system south of SCE's Vincent Substation in order to deliver TWRA wind generation to SCE's load centers in the Los Angeles Basin. Segment 9 would involve building a new substation (Whirlwind Substation in Kern County), expanding two existing substations (Antelope and Vincent substations), and upgrading three substations (Gould, Mesa, and Mira Loma substations).

SCE previously requested approval for Segments 1, 2, and 3 of the Antelope Transmission Project, which would also enhance transmission and related infrastructure serving the TWRA. Segments 1 to 3 would provide capacity for 700 MW. Segments 1, 2, and 3 of the Antelope Transmission Project (700 MW) and TRTP Segments 4 through 11 (3,800 MW) would provide the desired transmission capacity of 4,500 MW for wind generation from the TWRA.

It is important to note that although the intent of the TRTP is to provide the electrical facilities necessary to reliably interconnect and integrate up to 3,800 MW of new wind generation, it may become utilized for other sources of energy generation. As discussed above, approval of the TRTP or an alternative would not result in approval of any specific wind generation project. Generating facilities planning to re-power, or new generating facilities seeking to interconnect to the CAISO Controlled Grid are required to submit an Interconnection Request to CAISO. Requests are approved based on the order they are received. Based on the order of interconnection requests, it is possible that other types of energy projects may connect into TRTP prior to wind projects. For a description of other types of foreseeable energy projects, please see Section 2.9.3 (Energy Infrastructure Project).

6.1.2 Wind Energy Combining District Zoning Ordinance

The TWRA is located in southern Kern County. To accommodate the anticipated wind development in the TWRA, the Wind Energy (WE) Combining District was adopted as Chapter 19.46 of the Kern County Zoning Ordinance in 1986. The WE Combining District promotes the development of wind energy in Kern County and shall only be combined (creation of an overlay zone) with any of the following zoning districts:

- Exclusive Agriculture (A),
- Light Industrial (M-1),
- Medium Industrial (M-2),

- Heavy Industrial (M-3),
- Natural Resource (NR) (with a minimum lot size of twenty acres),
- Recreation-Forestry (RF) (with a minimum lot size of 20 acres),
- Limited Agriculture (A-1) (with a minimum lot size of 20 acres), and
- Estate (E) (with a minimum lot size of 20 acres).

The WE Combining District permits the use of wind-driven electrical generators, accessory administrative and maintenance structures and facilities, electrical substations, transmission lines, and other such facilities and electrical structures related to the main use (Kern County Ordinance 19.64.020). The WE Combining District also permits uses subject to a conditional use permit, including experimental wind-driven electrical generators and the manufacture and assembly of wind-driven electrical generators (Kern County Ordinance 19.64.030).

The WE Combining District regulates lot sizes, setbacks, and height limits (Kern County Ordinance 19.64.050, 19.64.070, 19.64.080). In particular, the WE Combining District establishes 600 feet as the maximum height for wind turbines and is subject to Section 19.08.160.B (military review requirements), and specifies that the color of turbine blades and towers must be non-reflective and unobtrusive and that each turbine or the total project perimeter must be fenced (Kern County Ordinance 19.64.080, 19.64.140 (B), (C). and (G)). Development within a WE zone requires approval of a detailed plot plan which shows compliance with mitigation measures incorporated into any environmental documents that have been adopted for the implementation of a WE district for specific parcels (Kern County Ordinance 19.64.130).

The WE Combining District also requires that noise levels associated with turbine operations not exceed 45 a-weighted decibels (dBA) for more than five minutes out of any one hour time period or 50 dBA for any period of time if the turbine is within 50 feet of any existing residence, school, hospital, church, or public library (Kern County Ordinance 19.64.140 (J)). However, a waiver may be obtained by the affected property owners acknowledging that they are aware of the noise, but consent to the noise limit in excess of those permitted in the ordinance (Kern County Ordinance 19.64.140 (J)(8)).

6.1.3 Wind Energy Permitting Process in Kern County

A typical proposed wind energy project would have to go through the following permitting process in order to be approved by Kern County:

- **Determine eligibility of project site for the WE Combining District.** As stated above, wind energy projects in Kern County must be proposed on sites that are zoned for Exclusive Agriculture (A), Light Industrial (M-1), Medium Industrial (M-2), Heavy Industrial (M-3), Natural Resource (NR) (with a minimum lot size of twenty acres), Recreation-Forestry (RF) (with a minimum lot size of 20 acres), Limited Agriculture (A-1) (with a minimum lot size of 20 acres), and Estate (E). A WE designation can only be applied to the abovementioned zone districts. Wind projects are permitted uses within these zones and must meet the requirements for setbacks, minimum lot size, noise levels, height limits, parking, etc. Additionally, in the case of wind energy projects, applicants must provide legal access to the project site without trespassing on private property (Michael Hollier, Kern County Planner, 2008).
- **Apply for a zone change.** If the project site is not located within a zone eligible for the WE Combining District, the applicant must apply for a zone change. An application for a zone change is a discretionary action subject to approval by the Kern County Board of Supervisors. The discretionary permit process is described in detail in Section 19.102.070 of Kern County zoning ordinance. A proposal for change of zone must be consistent with the land use designation that exists on the adopted elements of the Kern County General Plan. Such a request must also be consistent with the land use designation of a specific plan if a specific plan exists for the proposed project site. An application for change of zone will not be

accepted if the request is inconsistent with the General Plan or an adopted specific plan (Kern County, Instructions for Filing for Zone Change). If the proposed project is inconsistent with the General Plan, then the applicant must apply for a General Plan Amendment (Michael Hollier, Kern County Planner, 2008). If a General Plan Amendment is required, it will also follow the process described below.

In addition to the application form, a project description, a detailed plot plan, environmental assessment form and other information, materials as necessary in addition to filing fees may be required in order to begin the California Environmental Quality Act (CEQA) Initial Study and prepare a CEQA document. Kern County will respond within 30 days as to whether the application has been deemed complete or incomplete.

- **CEQA Review**. Once the application has been deemed complete, the application will be reviewed. The request for a zone change will trigger CEQA review of the proposed project. The degree of potential environmental impact of a project will be determined by the Planning Department after completing an Initial Study of the proposal. Kern County will then prepare the appropriate level of environmental document, based on the outcome of the Initial Study. A change of zone must comply with the provisions of the CEQA, and findings must be made and/or documents prepared signifying the degree of potential environmental impact of a proposed change of zone prior to the commencement of public hearing.
- **Preparation of Staff Report.** The Staff Report will be prepared which summarizes the CEQA document as appropriate. The Staff Report makes recommendations regarding the proposed project. The Kern County Planning Commission will consider the change of zone at a noticed and advertised public hearing. The Planning Commission's responsibility is to make a recommendation to the Kern County Board of Supervisors, after which another noticed and advertised public hearing is scheduled before the Board of Supervisors.
- **Approval for Final CEQA Document.** After completing, the steps above, the final CEQA document may be adopted by the Kern County Board of Supervisors. The action of the Board of Supervisors is final. If the zone change application is granted approval, the County will likely apply conditions of approval to the project.
- **Construction and Permit Compliance.** Conditions of approval may include the requirement to obtain pre-construction permits such as construction and building permits for grading and other related earthwork (Kern County Zoning Ordinance Section 19.64.130). In addition permits for construction related air quality emissions may be required. If mitigation measures are proposed as part of the environmental document, a Mitigation Monitoring and Reporting Plan (MMRP) will also need to be prepared. The MMRP identifies what mitigation measures were assigned to the proposed project and how and when the applicant needs to comply with the measures. If compliance is not demonstrated, then approval of the project can be revoked.

6.2 Wind Development in the TWRA

6.2.1 Setting

The TWRA is situated at the southern end of the San Joaquin Valley, southern Kern County, and spreads into the adjacent Mojave Desert. The city of Los Angeles is located approximately 55 miles south of the TWRA, the city of Bakersfield is located approximately 40 miles to the northwest, and the city of Lancaster, approximately 18 miles to the south. Located approximately 1.5 miles from the western border of the TWRA is the city of Tehachapi and adjacent to the eastern border is the town of Mojave. State Highway 14 runs along the eastern boundary of the TWRA from north to south, and State Highway 58 traverses through the center of the TWRA from east to west. The regional location is shown on Figure 6.2-1. Please note that all figures are at the end of this section.

The TWRA consists of undeveloped, rural land. The diverse land within the TWRA ranges from high desert floor to mountain passes, to tall mountains. Elevation ranges from 2,500 feet to approximately 8,000 feet above sea level. The TWRA is located in an area highly susceptible to wildfires. Vegetation in the TWRA consists of juniper woodland, Joshua tree woodland, and Mojave Creosote scrub, with areas of introduced annual grasses, native needle grass grassland, and pine oak woodlands. High-velocity wind conditions typically occur in the TWRA with occasional periods with Santa Ana-like wind conditions.

Properties within the TWRA are mostly undeveloped and include scattered residences and existing wind farms, mining operations, and grazing and open space lands. The Tehachapi Pass Wind Farm is located in the central part of the TWRA and the Sky River Ranch wind development is located in the northern part of the TWRA. The Los Angeles aqueduct traverses the TWRA from southwest to northeast. The Pacific Crest Trail traverses the TWRA from north to south.

Future transmission capacity in the TWRA includes SCE's proposed single-circuit 500-kV electrical transmission line (Segment 10 of the TRTP) would be located in a corridor that trends southwest to northeast and runs from the southern end of the TWRA at the proposed Whirlwind substation to the center of the TWRA at the Windhub substation. Additionally, Segment 4 of the TRTP, which consists of two new 220-kv transmission lines, runs northwest from the southern end of the TWRA at the proposed Whirlwind substation approximately 4 miles to the Cottonwind substation. Power generated by future wind projects would be delivered to customers by these regional transmission lines.

6.2.2 Study Area Description

6.2.2.1 Establishment of Study Area Boundaries

The TWRA study area boundary encompasses an area that can potentially provide 4,500 MW of wind generation. Included in this boundary are existing wind farm locations, the proposed PdV Wind Energy Project, and the proposed Alta-Oak Creek Mojave Project. The TWRA study area is shown on Figure 6.2-2. The following restrictions were used to develop the boundary of the TWRA:

- **Wind Power.** The boundary outlines an area with the greatest wind power density, while avoiding remote areas where extensive transmission infrastructure and access roads would be required. The blue areas within the boundary represent the highest wind power density at 800–100,200 Watts/m^2 with the yellow areas representing the lowest wind power density at 300-400 Watts/m^2 (see Figure 6.2-2). While many good wind areas exist that are small and remote, these may be uneconomical for wind development and may be located too far of a distance to be serviced by the TRTP and Antelope transmission systems. Hence, the boundary was drawn to include the areas with the most wind potential; thereby, being most economically feasible to develop.
- **Military Review Requirements.** The boundary also takes into account Section 19.64 of the Kern County Zoning Ordinance and Figure 19.08.160 of that same document, which requires military review of areas based on height restrictions. The TWRA study area does not include areas where military review is required for structures that exceed 80, 100, or 200 feet. Within the TWRA boundary, military review is required for structures that exceed 400 feet in height. As of February 2008, Kern County is in the process of modifying the zoning ordinance to allow structures in this area to reach 500 feet in height. This modification will allow the installation of turbines that generate up to 3 MW.
- **California Condor Preserve.** The boundary excludes the California Condor Preserve to the west. The California Condor Preserve Area is considered critical habitat for the California Condor, and is located within Tejon Ranch. Lands to the east of the eastern boundary of the Condor Preserve, but west of the TWRA boundary, are part of Tejon Ranch. These lands have also been excluded from the TWRA because of their proximity to the Condor Preserve.

- **Land Uses.** The boundary was carefully drawn to exclude the residential area located near the town of Mojave. It also excludes the Tehachapi Mountain Park, the only regional park in the area. The city of Tehachapi was also not included as the general plan prohibits the construction of structures exceeding 45 feet. Finally, the Northrop Grumman Tejon Test Facility was not included due to the expressed concerns regarding facility operation compatibility with wind generation projects.
- **Cultural Sensitivity.** The boundary excludes the area northeast of the city of Tehachapi and west of the TWRA boundary. Based on conversations with Kern County, this area contains potential cultural resources and would not be suitable for wind development.

The TWRA study area is divided into a northern area and a southern area. Electrical transmission to the northern area is expected to be provided by the Los Angeles Department of Water and Power (LADWP). The LADWP Pine Tree Wind Project is located within the northern tip of the TWRA study area and is currently proposed to be serviced by the LADWP transmission system. Although the LADWP transmission system is more accessible in the northern area, the possibility exists for the area to require future SCE service. Therefore, it has not been excluded from the TWRA study area.

The southern area would likely be served by the Windhub and Whirlwind substations of the SCE transmission system. It is expected that development of the TWRA would most likely occur in the southern area.

The total acreage of the TWRA is 232,198 acres (see Table 6.2-1). The northern area of the TWRA has 50,437 total acres, while the southern area has 181,761 acres. The combined total acreage of the areas within the TWRA that cannot be developed on for new wind energy projects is 27,037, or 133 acres for the northern area and 26,904 acres for the southern area. In the northern area, the prohibited area for new wind energy projects includes the existing wind farm sites. In the southern area, the prohibited areas for new wind energy projects include the proposed Alta -Oak Creek Mojave Project site, the proposed PdV Wind Energy Project site, the existing wind farm sites, and Platted Lands (zone excluded from wind development).

Table 6.2-1. Acreages of TWRA Study Area

Description	Acres	Percentage of the TWRA
Northern Area	50,437	21.72%
Southern Area	181,761	78.28%
Total TWRA	232,198	100%
Proposed Alta-Oak Creek Mojave Project	10,307	4.33%
Proposed PdV Wind Energy Project	6,475	2.72%
Existing Wind Farms	7,000	2.95%
Platted Lands (excluded from Zoning Ordinance)	3,255	1.37%
Total Restricted Areas	27,037	11.37%
Northern Area Available for Development	50,304	21.66%
Southern Area Available for Development	154,857	66.69%
Total Area Available for Development	205,161	88.35%

6.2.2.2 Current and Future Wind Development within the Study Area

Current Wind Development in the Study Area

Current wind development within the southern part of the study area consists of the Tehachapi Wind Farm, located approximately five miles west of the town of Mojave. It is composed of approximately 3,400 wind turbines and produces about 710 MW. This wind farm occupies approximately 6,867 acres of land within the TWRA. Older wind turbines compose most of this wind farm, which can be characterized

as turbines with low MW and shorter heights. Therefore, the wind farm consists of numerous turbines as opposed to new wind farms with fewer, new turbines of increased MW and height. However, much of the older wind turbines are currently being upgraded with the newer turbines.

The Sky River Ranch wind development, owned by Florida Power and Light is located in the northern part of the TWRA. It consists of 342 approximately 100- to 150-foot-tall turbines sited along an approximate 6-mile length of the Sweet Ridge ridgeline and occupies approximately 133 acres of land.

Future Wind Development in the Study Area

Future Wind Development in the Southern Portion of the Study Area

Several wind development projects within the TWRA are actively being pursued by their proponents, including the following:

PdV Wind Energy Project. The proposed PdV Wind Energy Project is located at the southern end of the TWRA, just north of the Cottonwind Substation (see Figure 6.2-2). It is proposed to be located on 5,820 acres of land with up to 300 wind turbines to produce 300 MW of wind energy. The project will also include a substation to step up the voltage generated by the turbines to meet the electrical systems' 220 kV or 500 kV voltage. The Final Environmental Impact Report (EIR) for this project was completed in February 2008 and has been recommended for approval by Kern County. A summary of the EIR for this project can be found in Appendix E.

Alta-Oak Creek Mojave Project. The proposed Alta-Oak Creek Mojave Project is located at the center of the TWRA, adjacent to the Windhub Substation (see Figure 6.2-2). It is proposed to be located on approximately 11,000 acres of land with up to 350 wind turbines to produce up to 800 MW of wind energy. This would be the first project of the Alta Wind Energy Center which is designed to produce 1,500 MW of wind power. Kern County is currently beginning the environmental review process for this project. An Initial Study was completed by Kern County in December 2008. Since this project is located within the TWRA, it is included in the programmatic analysis being conducted for the study area.

Other Foreseeable Wind Development

As mentioned above, generating facilities planning to re-power, or new generating facilities seeking to interconnect to the CAISO Controlled Grid are required to submit an Interconnection Request to CAISO. As energy projects are proposed, completed, or withdrawn, the CAISO queue is constantly changing, and updated regularly. Therefore, the queue has been tracked throughout the course of this analysis. On July 25, 2008, the total wind energy proposed for Kern County was 5,973.1 MW. The total has since changed to 4,791.1 MW, as listed in the January 9, 2009 CAISO queue. Table 6.2-2 shows upcoming stations and transmission lines in the southern area of the TWRA that have requested interconnection, along with the proposed and current on-line date.

Table 6.2-2. Kern County Wind Projects in the CA-ISO Controlled Grid Generation Queue

Queue Position	Station/Transmission Line	MWs	Proposed On-Line Date	Current On-Line Date
20	Antelope	300	12/31/06	12/31/08
73	Antelope Substation	250	12/31/07	12/31/08
79	Windhub Substation 66kV bus	51	6/01/06	5/31/09
84	Whirlwind Substation 230kV	340	12/31/09	12/31/09
86A	Vincent Substation	33.1	1/01/08	10/1/09
86B	Canwind Substation	34	1/01/08	10/1/09
91	Windhub Substation 66kV bus	51	3/31/10	3/31/10
93	Tehachapi Conceptual Substation #1	220	12/31/08	12/31/12
94	Tehachapi Conceptual Substation #2	180	12/31/08	12/31/11
95	Tehachapi Conceptual Substation #1	550	12/31/09	12/31/11
96	Tehachapi Conceptual Substation #1	600	12/31/09	12/31/10

Table 6.2-2. Kern County Wind Projects in the CA-ISO Controlled Grid Generation Queue

Queue Position	Station/Transmission Line	MWs	Proposed On-Line Date	Current On-Line Date
97	Tehachapi Conceptual Substation #5	160	12/31/09	12/31/13
100	Vincent Substation through Sagebrush 230 kV line	120	12/31/07	12/31/09
119	Windhub Substation 230kV	500	12/31/10	12/31/13
132	SCE 230kV Conceptual Substation #2	297	12/31/09	12/31/10
153	Whirlwind Substation 230 kV	100	5/30/08	12/31/12
159	66kV Antelope-Neenach-Bailey Line	100	5/30/08	12/31/13
175	SCE Proposed Whirlwind 230kV Substation	500	9/30/08	12/31/14
188	Windhub Substation 230 kV	200	12/15/13	11/15/12
409	Highwind Substation 230 kV	205	10/01/11	10/01/11

Source: California Independent System Operator Controlled Grid Generation Queue, as of January 9, 2009

Future Wind Development in the Northern Portion of the Study Area

Future projects to be located in the northern portion of the study area include LADWP's Pine Tree Wind Development Project and Pine Canyon Wind Project.

The Pine Tree Wind Development Project involves the construction of 80, 1.5-MW wind turbines on approximately 8,000 acres of land to produce 120-MW of wind energy. LADWP would also construct and operate approximately 8 miles of 230-kilovolt (kV) transmission line and a switching station, which would connect the project substation to an existing LADWP 230-kV transmission line. It is not expected to connect to SCE's transmission system. Construction on this project began in January of 2008.

The Pine Canyon Wind Project is expected to be constructed on 12,000 acres of land adjacent to the Pine Tree Wind Development Project. It is proposed to produce 150 MW of wind energy. No environmental documentation currently exists on this proposed project.

Available Acreage for Development

As presented in the Introduction, the TRTP and Antelope transmission projects were designed to provide 4,500 MW of transmission capacity for wind energy. This TWRA analysis has created a study area boundary that encompasses an area large enough to accommodate the siting of wind development projects necessary to achieve a capacity of 4,500 MW. Given that the proposed PdV Wind Energy Project and the proposed Alta-Oak Creek Mojave Project have a combined wind capacity of approximately 1,100 MW, an additional 3,400 MW of wind capacity would need to be developed within the study area for the TWRA to reach its full wind potential.

As presented in Table 6.2-1, the total land within the TWRA available for wind development is 205,161 acres or 88.35 percent of the TWRA. In the southern, this is 154,857 acres or 66.69 percent, and in the northern area, this is 50,304 acres or 21.66 percent. Wind farms typically require 5 to 17 acres per MW generated. In order to develop an additional 3,400 MW of wind capacity, approximately 17,000 to 57,800 acres of land would be required. The southern area of the TWRA alone should be able to accommodate this required acreage.

It is important to note that not all available land within the TWRA would be developed as wind intensities vary and remote areas where extensive transmission infrastructure and access roads would be required would not be favorable.

6.2.3 Wind Facility Components

6.2.3.1 Turbine Characteristics (size, type, components)

There are two basic designs of wind electric turbines: vertical-axis, or "egg-beater" style, and horizontal-axis (propeller-style) machines. Horizontal-axis wind turbines, which are most common today and would most likely be used at future wind projects in the TWRA, constitute nearly all of the "utility-scale" (100 kilowatts, kW, capacity and larger) turbines in the global market.

Turbine subsystems include: a rotor, or blades, which convert the wind's energy into rotational shaft energy; a nacelle (enclosure) containing a drive train, usually including a gearbox and a generator; a tower, to support the rotor and drive train; and electronic equipment such as controls, electrical cables, ground support equipment, and interconnection equipment. The turbine nacelle and rotor design is 3-bladed, with an upwind active yaw horizontal-axis configuration, which is the predominant design standard in the wind industry today. Wind turbines are mostly tubular and made of steel. The blades are made of fiberglass-reinforced polyester or wood-epoxy.

The average size of wind turbines installed in the U.S. in 2006 increased to roughly 1.6 MW. Average turbine size continues to increase over time; nearly 17 percent of all turbines installed in 2006 had a nameplate capacity in excess of 2 MW, compared to just 0.1 percent of turbines installed in 2002 through 2003 and 2004 through 2005. GE's 1.5-MW wind turbine remained the nation's most-installed turbine in 2006. Based on wind conditions and topographical constraints, larger turbines could be used and therefore, fewer turbines would be required.

Utility-scale wind turbines for land-based wind farms come in various sizes, with rotor diameters ranging from about 50 meters to about 90 meters, and with towers of roughly the same size. A 90-meter tower would have a total height from the tower base to the tip of the rotor of approximately 135 meters (442 feet). The total height of a turbine and tower structures would likely range from 380 to 440 feet depending on the turbine size, elevation, and topography at each tower location. The rotor-diameter would be approximately 300 feet for a 2 MW turbine and up to 340 feet for a 3.6 MW turbine.

The output of a wind turbine depends on the turbine's size and the wind's speed through the rotor. Wind turbines being manufactured now have power ratings ranging from 250 watts to 5 megawatts (MW). The rotational speed of the blades of a 2 MW turbine would be relatively slow, averaging approximately 20 revolutions per minute (rpm). This is compared to the historic turbines' faster rotational speed of 36 to 38 rpm.

Siting and spacing of wind turbines within the TWRA depends on site-specific conditions that are influenced by terrain and wind conditions. The ultimate location of turbines would need to be determined after a more detailed analysis of the terrain and wind in these areas. Turbines would likely be located on ridge-tops and in some areas with sufficient upwind space, multiple rows of turbines could be used. The wake of upwind turbines can substantially diminish the velocity and increase the turbulence at downwind turbines. Where the rows are sufficiently spaced, the losses can be minimized. Crosswind spacing is less likely to diminish turbine productivity.

It is assumed that a range of turbine models for other wind projects would be needed to address market and manufacturer constraints that may ultimately dictate the type of turbine available once a project has been permitted. Therefore, it is assumed that a range of turbines from 1 to 3 MW would be the most probable turbine size used in the development of wind resources in the TWRA.

Tower

Each wind turbine would be supported by a hollow, tubular steel tower that also houses the electric cable that transports energy from the generator to the transformer at the base of the tower. Turbine tower heights would be between approximately 226 and 263 feet. Access to the tower would be via a steel door at the base of the tower. A ladder within the tower would provide personnel access to the equipment in the nacelle. A computerized control cabinet would be located inside and at the base of the tower. The towers would be painted a nonreflective, unobtrusive color or have a nonreflective surface. The complete height of the turbine would be between approximately 327 and 407 feet. Due to the height restriction of 400 feet in Kern County, a turbine that exceeds 400 feet would have to be installed below ground level.

Rotor Blades

Each wind turbine has three rotor blades, which generate energy through their rotation. The rotor blades are attached to a central hub at the top of the tower and to the turbine generator within the nacelle where the energy is transferred. The blade lengths would be between approximately 100 and 145 feet and would be composed of laminated fiberglass or a fiberglass composite with a smooth outer surface. The blades would be painted a nonreflective, unobtrusive color or have a nonreflective surface.

Nacelle

The nacelle is a rectangular box located directly behind the central hub and would contain the generator, generator control system, and other equipment. It is sized to provide sufficient room for maintenance personnel to work on the machinery inside it. The exterior surface of the nacelle is constructed of fiberglass. During maintenance, personnel would access the nacelle from a steel ladder inside the tower. Access to the nacelle from the tower would be from a hatch at the base of the frame.

Braking System

A braking system is included to prevent rotors from dislocating from the turbine. The automatic breaking system would shut down the turbines in the event of a malfunction. As a second safety measure, personnel could stop, start, and rotate each of the turbines parallel to the prevailing wind direction using the control panel inside the nacelle or from the bottom of the tower. Switches at the top of the tower would prevent service personnel at the bottom from operating certain systems while a maintenance worker is inside the nacelle. Each turbine could also be controlled from the on-site operations and maintenance (O&M) building.

Safety Lighting

Future wind projects within the TWRA would be constructed and operated in accordance with Federal Aviation Administration (FAA) rules for structural lighting, locations, and height. Safety lighting would be installed on the exterior of some of the nacelles in compliance with FAA rules. Specific requirements for future wind projects would have to be developed in conjunction with the FAA based on the turbine heights and site-specific aviation conditions. The FAA recently changed its guidance for wind turbine lighting and now requires only synchronized red flashing lights at night and none during daylight hours.

Lightning Protection System

Each wind turbine, including the rotor blades would be equipped with a lightning protection system for protection against potential lightning strikes. The lightning protection system would be connected to an

underground grounding arrangement to facilitate lightning flowing safely to the ground. In addition, all equipment, cables, and structures comprising the wind turbines would be connected to a metallic project-wide grounding network.

Turbine Foundation/Pad

Wind turbines would stand on steel-reinforced concrete foundations designed for the specific subsurface soil conditions at each individual turbine site. Foundation design types may include an inverted T-type foundation, a dead-man type foundation, or a pile type foundation and would be selected based on site-specific conditions identified and assessed during geotechnical studies and the design engineer's requirements. The underground portion of the tower foundation could reach depths up to approximately 50 feet by 20 feet in diameter and would extend approximately 1 foot above the ground surface. The aboveground disturbance associated with installation of the turbine foundation, including a larger area around the foundation called the turbine pad, would be approximately 150 feet by 150 feet.

Power Collection System

The power collection system consists of underground electrical feeder lines that would transport energy produced by the turbines to a new project substation. Initially, power generated by the turbines would be fed down the tower through cables connected to a pad-mounted electrical transformer located adjacent to and outside the tower base. From the transformer, power would be transferred to the underground feeder lines. Junction boxes would be located at various locations along the underground feeder lines to facilitate power collection. A control and data acquisition system would be linked to a communication cable in the same trench as the electrical feeder lines, separated by a layer of fill. The system would allow the operator to monitor project facilities during operation from remote locations and immediately identify any operational issues.

All on-site electrical feeder lines associated with the wind turbines would be installed underground likely within the footprint of disturbance for the proposed access roads or within the 150-foot by 150-foot turbine foundation/pad area, with the exception of tie-ins to utility-type transmission poles, towers, and lines.

Anemometer towers would be connected to the O&M building via the control and data acquisition system. These towers would be located throughout project sites to gather data on wind resources and weather. This tower system is used to control and operate the wind plant and is connected into the grid and controlled by the CAISO.

Transmission to Utility Substation

Each future wind project would need to construct a switchyard at the project site. The exact location of the switch yard would be dependent upon final design of each wind facility. A new transmission line would be required to connect the wind component switch yard to the utility substation, which would connect to the regional transmission line. Equipment at the switchyard would include transformers, breakers, and associated equipment. The switchyard would house the power generation control and relaying equipment, station batteries, and power collection system and would be remotely operated and periodically maintained (but would not be manned).

6.2.4 Availability of Turbines

Turbine availability (reliability) is a major factor in wind farm project success. Improved technology, an increase in political support, and a recent series of tax credits introduced in the United States for wind power has led to a shortage in wind turbines. Governments abroad and in the United States are providing subsidies in an effort to produce more clean energy and reduce emissions of greenhouse gases. Specific to the TWRA, California adopted the Energy Action Plan in 2003, which requires utilities to obtain at least 20 percent of their energy from renewable resources by the year 2010.

Modern wind turbines contain more than 8,000 components and require special transformers to spin their blades into electricity (Johnson, 2007). Individual suppliers who produce the numerous components have come to a standstill as demand has surpassed supply. Manufacturers depend on a network of component suppliers that, in turn, need years to ramp up production (Johnson, 2007). Developers nationwide have been affected by the shortage, but particularly in windy Western states such as California, Washington and Oregon (Newshouse News Service, 2007). According to energy consultants and power planners, developers face a two-year wait if they have not secured their turbines (Newshouse News Service, 2007).

There has been limited potential for wind power growth in the United States as a whole since government support appears to vary from state to state. Energy firms continue to rely on government subsidies since the generation of wind power is more costly when compared to the generation of coal or natural gas. This in turn has caused foreign manufacturers to be reluctant to build factories in the United States (Johnson, 2007).

The passing of a Federal mandate to support wind power could lead to the building of additional factories in the United States. At that point, demand may be closer to reaching supply. However, presently, the full development of the TWRA could take several years depending on turbine availability.

6.2.5 Construction

Typical project construction within the TWRA would include grading of roads, turbine pads, and crane pads; grading of substation, O&M building, switching station, materials laydown, and equipment staging areas; and construction of the turbine tower foundations and transformer pads. Depending on the soil and geotechnical conditions at each turbine site, the turbine tower would be mounted on a spread footing type foundation or a vertical mono-pier foundation. Excavation for the foundation would be required at each turbine site. Some blasting may be required. Several temporary and permanent anemometer (wind measurement) stations would be located in strategic positions on the various project sites. Each tower has a concrete foundation (up to 50 feet deep and 20 feet in diameter, depending on site conditions and tower diameter), with supporting cables extending to small concrete anchor points on the ground.

Traffic generated during construction would include truck traffic associated with transporting wind turbine components, concrete and reinforcing steel and potential on-site batch plants, mechanical equipment, and construction consumables; water trucks; and the delivery of construction equipment such as cranes and earth-moving machines.

6.2.5.1 Construction and Grading

During the construction period, relatively flat temporary pads would be constructed at each turbine site to provide a base for construction equipment, including the large crane needed to erect the tower and assemble the turbine. Installation of tower foundations would involve excavations to depths up to 50 feet below grade, with the diameters of excavations being roughly the same as the diameter of the tower base,

approximately 15 to 20 feet depending on turbine model selected. After backfilling of foundation voids, remaining excavated materials would need to be disposed of off-site or redistributed on the site. Contour grading would be conducted at each new turbine pad location as needed to match construction grade with the existing grade.

Based on the remoteness of the wind component sites, it may be necessary to construct a temporary concrete batching plant on site, especially if haul distances from existing or specially constructed off-site concrete plants are over an hour (BLM, 2005). Depending on available materials on site, constituents of concrete (aggregate and sand) may also need to be hauled to the on-site batching plant. Electrical power for the batching plant would be provided by a portable diesel engine/generator set (nominally 125-kW capacity). Up to 10 acres could be required for a typical batching plant. This area would need to be cleared of vegetation and some grading might be required to level the site. The soils at the batch plant would be expected to be heavily compacted as a result of plant activities including associated truck traffic (each foundation would require about 18 to 20 concrete-hauling truck trips). The concrete batch plant would also be utilized for other foundations required for the wind component, including the switchyard and operation and maintenance facilities.

Existing access roads would be retained and improved to accommodate large construction trucks and trailers. New access and spur roads would also be constructed to provide construction and maintenance access to each new turbine site. Access and spur roadways that would be needed for construction vehicle access would be cleared of vegetation and graded to a width of approximately 30 to 40 feet for the construction period, and then restored to widths of 16-24 feet once the construction period is complete. The length and resultant disturbance resulting from the improvement of existing access roads and construction of new access and spur roads would be dependent upon the final siting of turbine pads within the wind component sites.

Lay-down areas would also be required for equipment and material staging. The construction of equipment lay-down areas would involve the removal of vegetation for the purposes of safety, access, and visibility during lifting operations. Although surface soils may not need to be removed, some regrading might be required to create relatively level areas, and rock and/or gravel are expected to be laid down to give these areas all-weather accessibility and to support the weights of construction vehicles and staged equipment. The number and size of lay-down areas will be subject to the construction contractor's discretion.

Trenching would be required for the installation of turbine and switch yard interconnection systems. A minimum three foot trench depth is assumed, requiring a 20- to 40-foot construction right-of-way depending upon topography and the presence of other physical obstacles. The length and area of disturbance resulting from turbine and switch yard interconnection installation would be dependent upon the final siting of turbine pads. The switch yard site is expected to result in an approximate total disturbance of three to five acres. Depending upon switch yard siting, construction of new permanent access route might also be required.

Site preparation for operation and maintenance facilities is assumed, including parking areas. Each operation and maintenance site would include an approximately 5,000 square-foot storage facility. Depending upon facility siting, construction of new permanent access routes might also be required.

For the meteorological towers that would remain in place during the operation of the wind component, construction of permanent foundations and access roads, and undergrounding of cable would be required. During the construction period, relatively flat temporary pads would be constructed at each

meteorological tower location to allow for construction vehicle access, and foundation and tower installation. The total graded area for permanent towers is estimated to be approximately 1/2 acre per tower, of which 0.25 acres would be permanent disturbance. Because most construction equipment cannot be transported on public roads, it is most likely that fuel would be staged on site in portable tanks. These tanks are expected to be staged at or near the lay-down areas and resupplied throughout the construction period by commercial vendors. The total volume of fuel (primarily diesel fuel) to be present on site is not expected to exceed 1,000 gallons. No major equipment maintenance is expected to be performed on site on construction equipment, other than maintenance of fluid levels.

A new transmission line would be placed aboveground to connect the wind component switch yard to the utility substation. Standard tubular steel pole (TSP) structures are assumed. Construction would involve the installation of foundations, erection of TSP structures, and cable pulling, tensioning, and splicing. A large auger would be used to dig foundation holes for each structure. A cage of reinforced steel with anchor bolts would be installed and concrete would be placed in the hole. Cranes would most likely be used to erect the pre-assembled structures; helicopters are also an option. Temporary disturbance around each TSP structure site would result from construction activity; permanent disturbance at the TSP structures sites would be limited to the diameter of the foundations. Additional temporary disturbance would occur as a result of construction access roads and cable pulling, tensioning, and splicing sites. Permanent access roads would also be required. The exact number of access roads, both temporary and permanent, and temporary pulling/tensioning/splicing sites required will be a function of terrain; existing buildings, roadways, utilities, etc.; and transmission line alignment.

All temporarily disturbed areas, including crane pads, the outside shoulders of all construction access roads, and interconnect and power line rights-of-way would be re-seeded and reclaimed to native vegetation once the construction period is completed.

On the basis of experience to date, the final footprint or permanent disturbance of the wind component (turbine towers, access roads, facility interconnections, switch yard, operation and maintenance facilities, and ancillary facilities) would be 5 to 10 percent of the total acreage of the wind component sites (BLM, 2005).

6.2.5.2 Construction Personnel and Time Frame

It is assumed that construction of the wind component would need to occur within three or more phases to accomplish installation of turbines and associated facilities (access roads, interconnections, switch yard, meteorological towers, and operation and maintenance facilities), and site restoration. Staffing for the construction of the wind component would require approximately 50 to 75 people to construct each phase of the project and an additional 50 people per phase to support overall construction activities.

Construction would occur following completion of the environmental review process, approval of the Land Use Permit, and obtaining all other necessary permits for construction. Each phase would take approximately nine to 18 months to complete. However, since several future wind projects are anticipated over the coming years, construction phases for each project would occur intermittently depending on the timing of individual project approvals and availability of turbines.

6.2.6 Operation

A project O&M protocol would be developed for each future wind project to be implemented throughout the life of the project. The protocol would specify routine turbine maintenance and operation, which

usually adheres to the maintenance program developed by the turbine manufacturer. O&M personnel for each project would conduct maintenance activities for wind turbines as required by the routine maintenance schedule provided by the turbine supplier or as required to keep the equipment in operation. Typically, each turbine would require approximately 40 to 50 hours per year of scheduled mechanical and electrical maintenance. With most modern commercial wind farms, turbines are monitored via computers located in the base of each turbine tower as well as from the O&M facility using telecommunication linkages. Routine maintenance may include, but would not be limited to, replacing lubricating fluids, checking parts for wear and replacing as required, and recording data from data-recording chips in all pertinent equipment including anemometers. Additionally, O&M personnel would also inspect and maintain access roads, crane and turbine pads, erosion control systems, and parameter fencing areas regularly and maintain them to ensure minimal degradation. O&M facilities would be used for the storage of hazardous materials such as lubricants, fuel, and solvents, and might also include an external propane tank to provide heating for the O&M facility.

6.2.7 Decommissioning

Decommissioning refers to the dismantling of the project elements and restoration of the site upon completion of the operating life of the facility. Periodic replacement of equipment can extend operating life indefinitely, depending on future demand for electricity generated by the project. The estimated life of future wind projects in the TWRA depends primarily on the demand for power, which is expected to continue growing. However, it is assumed that most projects would have an expected 25- to 40-year life.

At the end of the project's useful life, decommissioning would involve removing the turbines and support towers, transformers, and substation, and removing the upper portion of foundations so that they would not be exposed at the surface. Generally, turbines, electrical components, and towers would either be resold or recycled for scrap. All unsalvageable materials should be disposed of at authorized sites in accordance with applicable laws and regulations. Site reclamation could include regrading, spot replacement of topsoil, and revegetation of project-disturbed areas. Foundations would be removed and access roads could be reclaimed or left in place based on landowner preference.

6.3 Introduction to Environmental Analysis

Section Content and Organization

This Programmatic Analysis examines the environmental consequences associated with the development of future wind projects within the TWRA. Sections 6.4 through 6.19 include analyses of 16 environmental issue areas. Analysis within each issue area includes consideration of future wind projects within the TWRA, which are described fully in Section 6.2. The basic methodology used in the environmental analysis is described below.

Within each of the environmental issue area sections listed above, the environmental analysis of the TWRA is organized according to the following major subheadings:

- Affected Environment
- Applicable Regulations, Plans, and Standards
- Impact Analysis

Each environmental impact identified is associated with a specific significance criterion, which is used to evaluate the severity, or significance, of the impact. Mitigation measures are proposed for each significant impact identified.

The purpose of identifying the potential environmental impacts and the associated mitigation measures is to provide information to decision makers and the public about the TWRA's environmental effects that can be used in deliberations about where and how to site future wind projects.

Environmental Assessment Methodology

For purposes of this Programmatic Analysis, and pursuant to CEQA Guidelines (Section 15125[a]), the environmental setting used to determine the impacts associated with development of the TWRA is based on the environmental conditions that existed in the study area in February 2008.

This Programmatic Analysis evaluates the potential environmental impacts that would be caused by future wind projects within the TWRA. At the time this analysis was conducted, no information was available on potential future wind development projects other than that specified in Section 6.2.2.2. As discussed, included in the TWRA boundary are the proposed PdV Wind Energy Project (for which an EIR has already been prepared by Kern County and provided in Appendix A), and the proposed Alta-Oak Creek Mojave Project (Alta Wind Project). An Initial Study was completed for the Alta Wind Project by Kern County in December 2008. The environmental analysis presented in this chapter assumes that issues and impacts would be similar to those discussed in the EIR completed for the PdV Wind Energy Project. Since most future wind facilities would be located within the same general vicinity and would be designed to perform a similar function, it is reasonable to assume that the parameters and assumptions used for the PdV Wind Energy Project would generally be applicable to future wind development projects.

The proposed Alta Wind Project is still undergoing planning and environmental review. Therefore, to the extent possible given currently available information, the Alta Wind Project is addressed in the following sections for each environmental issue area. In most cases, the analysis of impacts to the TWRA will include and apply to the proposed Alta Wind Project as complete information on this project is not currently available.

The impacts identified were compared with significance criteria established by Kern County and, based on these criteria, the impacts have been classified according to significance categories described below.

For each significant impact identified, mitigation measures have been identified that would reduce or avoid the impact. Where feasible, mitigation measures have been identified that would reduce significant impacts to a less-than-significant level. These mitigation measures are presented for consideration by decision makers as possible conditions for the approval of future wind projects within the TWRA.

Significance Categories

In order to provide for a comprehensive and systematic evaluation of potential environmental impacts to the issue area categories, a classification system was applied to the impacts of development of the TWRA. These classifications indicate whether an identified impact is significant and whether mitigation measures can reduce the severity of the impact to a level that is less than significant. The following classifications were uniformly applied to each identified impact:

Class I: Significant impact; cannot be mitigated to a level that is less than significant. Class I impacts are significant adverse effects that cannot be mitigated below a level of significance through the application of feasible mitigation measures. Class I impacts are significant and unavoidable.

Class II: Significant impact; can be mitigated to a level that is less than significant. A Class II impact is a significant adverse effect that can be reduced to a less than significant level through the application of feasible mitigation measures presented in this Programmatic Analysis.

Class III: Adverse, less than significant. A Class III impact is a minor change or effect on the environment that does not meet or exceed the criteria established to gauge significance.

Class IV: Beneficial impact. Class IV impacts represent beneficial effects that would result from future wind project implementation.

In cases where there is a potential for a certain type of impact, but no such impact would occur for the proposed Project or an alternative, the reasons for no occurrence of an impact are described and no impact classification is assigned.

A significant impact is defined by CEQA as "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project" (State CEQA Guidelines Section 15382). The determination of impact significance is based on the independent judgment of the Lead Agency which, for this Programmatic Analysis, is the CPUC. The establishment of any criteria used to evaluate the significance of impacts is also the responsibility of the Lead Agency. Criteria used to determine the significance of the TWRA's development and operation impacts are presented in the sections addressing individual environmental issue areas (Sections 6.4 through 6.19).

The determination of whether or not an impact is significant is the key consideration in the environmental impact analysis. For significant impacts, adequate information and analysis must be provided to characterize each impact and provide the public and decision-makers with an understanding of the nature and severity of the impact. The level of detail and analysis needed to adequately characterize significant impacts varies depending on the nature of the impact. Certain types of impacts require quantitative analysis in order to determine impact significance, characterize adverse effects, and formulate appropriate mitigation measures. Other types of impacts require more qualitative analysis and the determination of impact significance is based on professional judgment of the Programmatic Analysis preparers or guidance provided by resource agencies.

6.4 Aesthetics

This section addresses the potential Aesthetics impacts of expected and potential wind development in the TWRA. A description of the Affected Environment for Aesthetics is presented below in Section 6.4.1, followed by a description of Applicable Laws, Regulations, and Standards in Section 6.4.2, and the Impact Analysis presented in Section 6.4.3.

6.4.1 Affected Environment

The TWRA is situated at the southern end of the San Joaquin Valley and spreads into the adjacent Mojave Desert. It is located in southern Kern County, approximately 55 miles north of the city of Los Angeles. The city of Bakersfield is located approximately 40 miles to the northwest and the city of Lancaster, approximately 18 miles to the south of the TWRA. Located approximately 1.5 miles from the western border of the TWRA is the city of Tehachapi and adjacent to the eastern border is the town of Mojave.

State Highway 14 runs along the eastern boundary of the TWRA from north to south, and State Highway 58 traverses through the center of the TWRA from east to west.

The TWRA study area is primarily an undeveloped, rural area located in the Tehachapi Mountains of Antelope Valley, which runs between the Tehachapi Mountains to the west and the Edwards Air Force Base to the east. Landforms in the area consist of valleys and mountains. The elevation of the area ranges from between 2,500 feet to approximately 8,000 feet above mean sea level (msl).

Properties are mostly undeveloped and include scattered residences and wind farms, mining operations, a cement plant, and grazing and open space lands. Existing scattered wind farms are located in the central and northern parts of the TWRA. The Los Angeles aqueduct traverses the TWRA from southwest to northeast.

SCE's proposed single-circuit 500-kV electrical transmission line (Segment 10 of the TRTP) would be located in a corridor that trends southwest to northeast and runs from the southern end of the TWRA at the proposed Whirlwind substation to the center of the TWRA at the Windhub substation. Additionally, Segment 4 of the TRTP, which consists of two new 220-kv transmission lines, runs northwest from the southern end of the TWRA at the proposed Whirlwind substation approximately 4 miles to the Cottonwind substation. Power generated by future wind projects would be delivered to customers by these regional transmission lines. These transmission lines would be supported by lattice steel structures and would be visually dominant to viewers within approximately one-quarter mile and less noticeable to viewers beyond approximately one-half mile.

Viewers of potential wind farm sites would include recreational viewers such as off-highway vehicles, bicyclists, and hikers, and to a much lesser extent, motorists traveling primary roads. The Pacific Crest Trail, which is designated as a National Scenic Trail, traverses the project area and extends to the north and south. Views would be significantly noticeable for individuals using areas near potential wind farm sites or nearby areas for recreation such as hiking on the Pacific Crest Trail.

State Route (SR) 14 travels adjacent to portions of the eastern boundary of the TWRA and SR-58 traverses the TWRA in an east-west orientation. Potential wind farm project sites routes could be visible from these roadways. They are not officially designated scenic highways, but are eligible as such. Commuter viewers are typically the smallest percentage of viewers in the viewshed and usually have a lower level of sensitivity. Due to a motorist's concentration on driving and focus on destination, they usually have a moderate to low sensitivity to the visual environment.

Existing wind farms would emit nighttime lighting atop the wind turbines. The area is generally very dark after sunset and nighttime views are of high visual quality.

Alta Wind Project

The Alta Wind Project is located within the southern portion of the TWRA. The Alta Wind Project site consists of an undeveloped, rural area located in the Tehachapi Mountains of Antelope Valley, which runs between the Tehachapi Mountains to the west and the Edwards Air Force Base to the east. Landforms in the Alta Wind Project area consist of valleys and mountains. The Alta Wind Project site is located between Mendiburu Canyon and Oak Creek and elevation is between 3,000 and 4,800 feet above msl. The Alta Wind Project area can be characterized as gradually sloping from the northwest to the southeast and drained by Oak Creek.

Properties surrounding the Alta Wind Project site are mostly undeveloped and include scattered wind farms, mining operations, a cement plant, and open space. Existing scattered wind farms are located to the north and around the western portion of the Alta Wind Project site and would emit nighttime lighting atop the wind turbines. The city of Tehachapi lies approximately 3 miles northwest of the Alta Wind Project site and further west lies extensive areas of natural open space within the Tehachapi Mountains. The Los Angeles aqueduct, mining operations, and Oak Creek are located to the south and the proposed PdV Wind Energy Project is located approximately 4.5 miles southwest of the Alta Wind Project site. More open space and mining operations are located to the east of Alta Wind Project site, as well as the city of Mojave at approximately 3.5 miles. State Route (SR) 14 is located approximately 3.1 miles east and SR-58 is located approximately 2.5 miles north and 3.5 miles east of the Alta Wind Project site. These routes would be visible in the vicinity of the Alta Wind Project site. They are not officially designated scenic highways, but are eligible as such.

Viewers at the Alta Wind Project site include recreational viewers such as off-highway vehicles, bicyclists, and hikers, and to a much lesser extent, motorists traveling primary roads. The Pacific Crest Trail, which is designated as a National Scenic Trail, traverses the Alta Wind Project site and extends to the north and south. The area is generally very dark after sunset and nighttime views are of high visual quality. Since no glare-producing structures currently exist on the Alta Wind Project site, glare is not generated.

6.4.2 Applicable Laws, Regulations, and Standards

6.4.2.1 Federal

Activities associated with development of the TWRA (including the proposed Alta Wind Project) would be subject to the same Federal requirements as specified in Section 3.14 (Visual Resources).

6.4.2.2 State

Activities associated with development of the TWRA (including the proposed Alta Wind Project) would be subject to the same State requirements as specified in Section 3.14 (Visual Resources).

6.4.2.3 Local

Kern County General Plan

Chapter 1. Land Use, Open Space, and Conservation
Element 1.10.7 Light and Glare
Policies

- Policy 47. Ensure that light and glare from discretionary new development projects are minimized in rural as well as urban areas.
- Policy 48. Encourage the use of low-glare lighting to minimize nighttime glare effects on neighboring properties.

Implementation Measures

Implementation Measure AA. The County shall utilize CEQA Guidelines and the provisions of the Zoning Ordinance to minimize the impacts of light and glare on adjacent properties and in rural undeveloped areas.

Kern County Zoning Ordinance

The Wind Energy (WE) Combining District (Chapter 19.64) contains development standards and conditions (Section 19.64.140) that would be applicable to the siting and operation of turbines. The following provisions apply to the visual characteristics of the project.

- 19.64.140(B): Towers and blades shall be painted a nonreflective, unobtrusive color or have a nonreflective surface.
- 19.64.140(D): All on-site electrical power lines associated with wind machines shall be installed underground within one hundred fifty (150) feet of a wind turbine and elsewhere when practicable, excepting there from "tie-ins" to utility type transmission poles, towers, and lines. However, if project terrain or other factors are found to be unsuitable to accomplish the intent and purpose of this provision, engineered above-ground electrical power lines shall be allowed.
- 19.64.140(I): One (1) project identification sign, located at each point of project ingress and egress, not to exceed thirty-two (32) square feet in area, may be erected on the project site. No other signs shall be installed other than safety signs and the required warning signs. The developer shall submit a sign elevation drawing to the planning director for review and approval prior to installation.

6.4.3 Impact Analysis

At the time this analysis was conducted, no information was available on potential future wind development projects other than that specified in Section 6.2.2.2. As a result, the environmental analysis presented here assumes that issues and impacts would be similar to those discussed in the EIR completed for the PdV Wind Energy Project (See Appendix A). Since most future wind facilities would be located within the same general vicinity and would be designed to perform a similar function, it is reasonable to assume that the parameters and assumptions used for the PdV Wind Energy Project would generally be applicable to future wind development projects.

The aesthetic resource impacts of the future proposed wind projects are discussed below under subheadings corresponding to each of the significance criterion. The analysis describes the impacts of the proposed projects related to aesthetics, for each criterion, determines whether the proposed projects would result in significant impacts.

6.4.3.1 Criteria for Determining Impact Significance

The significance criteria listed below are applicable to Aesthetic resources. The proposed Project (including the proposed Alta Wind Project) would result in significant impacts to Aesthetics if it would meet any of the following significance criteria:

- Criterion TWRA AES1: Have a substantial adverse effect on a scenic vista.
- Criterion TWRA AES2: Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.
- Criterion TWRA AES3: Substantially degrade the existing visual character or quality of the site and its surroundings.
- Criterion TWRA AES4: Create a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area.

6.4.3.2 Impacts and Mitigation Measures

The following section describes potential impacts and mitigation measures related to Aesthetic Resources that could occur as a result of future wind project development within the TWRA, including the Alta

Wind Project. A summary of identified impacts and associated mitigation measures for the TWRA is presented in Table 6.20-1.

Impacts are classified as Class I (significant, cannot be mitigated to a level that is less than significant), Class II (significant, can be mitigated to a level that is less than significant), Class III (adverse, but less than significant), or Class IV (beneficial). Detailed discussions of each impact are presented below.

Effects on Scenic Vistas (Criterion TWRA AES1)

Impact TWRA-AES-1: Future wind development would have an adverse effect on a scenic vista.

There are no officially designated scenic vistas located within the TWRA viewshed, but several unofficial public viewing areas exist, such as roadways and other publicly accessible locations.

Although existing wind farms are located within the TWRA, the natural condition of the potential wind development area would be converted by potential projects to a commercial-scale wind farm consisting of wind turbines approximately 400 feet tall. Therefore, the existing visual character of the area would be altered. Impacts would be significant.

Mitigation Measures for Impact TWRA-AES-1

No feasible mitigation measures can be implemented to preserve the natural condition of potential project sites.

CEQA Significance Conclusion

Impacts would be significant and unavoidable (Class I).

Damage to Scenic Resources along a State Scenic Highway (Criterion TWRA AES2)

Impact TWRA-AES-2: Future wind development would substantially damage scenic resources.

The California Scenic Highway System designates SR-14 and SR-58 as "Eligible" scenic highways. However, they are not officially designated at this time. Therefore, no impacts on state scenic highways would occur.

Degradation of Existing Visual Character or Quality (Criterion TWRA AES3)

Impact TWRA-AES-3: Future wind development would substantially degrade the existing visual character or quality of the site and its surroundings.

For each future wind facility, the wind turbines, operations and maintenance (O&M) facilities, project substation, overhead electrical transmission lines that would interconnect a potential project substation to a transmission line, and switching station and maintenance facilities located at the transmission inter-connection point have the potential to create significant visual impacts. Also, the clearing and grading required for proposed project access/maintenance roads and level pads for proposed project facilities could be visually apparent due to the removal of vegetation and the creation of cut and fill slopes.

Properties in the area are mostly undeveloped and similar to the existing conditions of potential project sites. Uses in surrounding areas include scattered residences and wind farms, mining operations, a cement plant and open space lands. The open space areas have been used for livestock grazing, off-road vehicle use, hunting, camping, or target practice. The surroundings of the potential wind facility sites would be

changed from open space view to a view of wind turbines, except for the surrounding area to the north where wind farms currently exist.

No feasible mitigation measures can be implemented to preserve the existing visual character of the potential wind facility sites. Impacts would be significant.

Mitigation Measures for Impact TWRA-AES-3

No feasible mitigation measures can be implemented to preserve the existing visual character of potential project sites.

CEQA Significance Conclusion

Impacts would be significant and unavoidable (Class I).

Light or Glare Effects on Daytime or Nighttime Views (Criterion TWRA AES4)

Impact TWRA-AES-4: Future wind development would create a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area.

Due to the height of the wind turbines, flashing white or red lights would be required by the FAA for safety. Lighting at night in the TWRA includes visible light from headlights from motorists traveling along SR-14, SR-58, and other roads; existing wind farms north and south of SR-14, and the town of Mojave and city of Tehachapi. Lighting may also exist from scattered residential housing.

Continuous lighting atop the wind turbines and security lighting for office and maintenance buildings would change the night sky view. Impacted viewers would include nearby residences and viewers using the Pacific Crest Trail who decide to camp out at night. This impact would substantially change the aesthetic character of the rural area and is considered potentially significant.

Mitigation Measures for Impact TWRA-AES-4

TWRA-AES-1: The applicant shall file a Notice of Construction with the FAA for the project. The applicant shall install lighting on turbines for aviation warning in accordance with FAA requirements only. The turbines shall not be lighted for other reasons.

TWRA-AES-2: All exterior lighting on the O&M building and on site fencing shall be shielded to minimize the impacts on the night sky.

CEQA Significance Conclusion

Impacts would be significant and unavoidable even after implementation of Mitigation Measures TWRA-AES-1 and TWRA-AES-2 (Class I).

6.5 Agriculture

This section addresses the potential Agriculture impacts of expected and potential wind development in the TWRA. A description of the Affected Environment for Agriculture is presented below in Section 6.5.1, followed by a description of Applicable Laws, Regulations, and Standards in Section 6.5.2, and the Impact Analysis presented in Section 6.5.3.

6.5.1 Affected Environment

This section describes the existing agricultural setting in the TWRA,

Kern County is the third-largest county in California by geographic area, characterized by its valley, mountain, and desert areas and has a large agricultural base, producing almost $3.5 billion in agricultural commodities in 2006 (Kern County, 2007a; Kern County, 2007b). Almonds, grapes, and milk comprise the top three agricultural products in Kern County by production value. Fruit and nut crops generated approximately $1.6 billion and field crops and range land generated approximately $393 million (Kern County, 2007c). Of Kern County's 5,166,720 acres, almost 31 percent of the land is used for agriculture, and approximately 32 percent of the land is under Williamson Act contract (Kern County, 2007a; CSAC, 2007).

Between 2002 and 2004 in Kern County, approximately 13,390 acres of Farmland was converted, largely due to the development of new home construction around Bakersfield and Rosedale as well as the removal of irrigated farmland from production and its subsequent use as grazing land (DOC, 2004).

Table 6.5-1, below indicates the total acreage of agricultural land in Kern County along with the acreage of Prime Farmland, Unique Farmland, Farmland of Statewide Importance, Farmland of Local Importance, Grazing Land, and agricultural land under Williamson Act Contract.

Table 6.5-1. Important Farmland and Williamson Act Land Kern County (acres)

County	Prime Farmland	Unique Farmland	Farmland of Statewide Importance	Farmland of Local Importance	Grazing Land	Total Agricultural Land	Williamson Act Contract Land
Kern	518,804	51,095	106,326	0	911,708	1,587,933	1,649,779

DOC, 2004

Table 6.5-2 was prepared using the TWRA boundary overlay and indicates that grazing land (180,017 acres) is the only agricultural land within the TWRA. There are 34,368 acres of Williamson Act Contract Land that are non-prime lands as well within the TWRA.

Table 6.5-2. Important Farmland and Williamson Act Land in TWRA (acres)

County	Prime Farmland	Unique Farmland	Farmland of Statewide Importance	Farmland of Local Importance	Grazing Land	Total Agricultural Land	Williamson Act Contract Land
Kern	0	0	0	0	180,017	180,017	34,368
Alta	0	0	0	0	7,367	7,367	0

Figure 6.5.1 shows the Grazing Land and agricultural land under Williamson Act Contract within the TWRA and the Alta Wind Project area.

Alta Wind Project

The proposed Alta Wind Project site is located along the southern foothills of the Tehachapi Mountains in the Mojave Desert, west of Mojave, CA (see Figure 6.5.1).

While other areas in Antelope Valley produce a variety of crops, including wheat (Kern County Department of Agriculture, 2005), the proposed Alta Wind project area has no developed water source, and, therefore, the agricultural productivity of the land is limited. The project area was historically and is currently used for agriculture, including grazing (mainly cattle and sheep), pasture use, and minimal dry-land farming.

6.5.2 Applicable Laws, Regulations, and Standards

6.5.2.1 Federal

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 National Resource Conservation Service's (NRCS) soil survey maps, land inventory and monitoring criteria developed by the NRCS, 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 two years. Figure 6.5-1 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 four 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 non-irrigated orchards or vineyards such as are 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.

6.5.2.2 State

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 ten 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 non-renewal 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. Non-renewal 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% reduction in the taxable value of land and growing improvements (in addition to Williamson Act tax benefits), the owner of the property promises not to develop the property into nonagricultural uses.

6.5.2.3 Local

Kern County General Plan

The Kern County General Plan states that agriculture is vital to the future of Kern County and 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). The Kern County General Plan includes three designations for agricultural land:

- 8.1 Intensive Agriculture (minimum parcel size 20 acres gross) — devoted to the production of irrigated crops or having potential for such use;
- 8.2 Resource Reserve (minimum parcel size 80 acres gross) — devoted to areas of mixed natural resource characteristics including rangeland; and
- 8.3 Extensive Agriculture (minimum parcel size 20 acres gross except lands subject to a Williamson Act contract/Farmland Security Zone contract, in which case the minimum parcel size shall be 80 acres gross) — devoted to uses involving large amounts of land with relatively low value-per-acre yields such as livestock grazing, dry-land farming, and woodlands.

Kern County Zoning Ordinance

The WE Combining District (Chapter 19.64) contains development standards and conditions (Section 19.64.140) that would be applicable to the siting and operation of turbines. The following provisions apply to continued agricultural use of the site:

- 19.64.140(B): Towers and blades shall be painted a nonreflective, unobtrusive color or have a nonreflective surface.
- 19.64.140(C): Fencing shall be erected for each wind machine or on the perimeter of the total project. Wind project facilities shall be enclosed with a minimum four- (4-) foot-high security fence constructed of four (4) strand barbed wire or materials of a higher quality. Fencing erected on the perimeter of the total project shall include minimum eighteen- (18-) inch by eighteen- (18-) inch signs warning of turbine dangers. Such signs shall be located a maximum of three hundred (300) feet apart and at all points of site ingress and egress. Where perimeter fencing is utilized, the Planning Director may waive this requirement for any portion of the site where unauthorized access is precluded due to topographic conditions.
- 19.64.140(D): All on-site electrical power lines associated with wind machines shall be installed underground within one hundred fifty (150) feet of a wind turbine and elsewhere when practicable, excepting there from "tie-ins' to utility type transmission poles, towers, and lines. However, if project terrain or other factors are found to be unsuitable to accomplish the intent and purpose of the provision, engineered aboveground electrical power lines shall be allowed.

- 19.64.140(H): All wind projects including wind generators and towers shall comply with all applicable County, State, and federal laws, ordinances, or regulations.
- 19.64.140(I): One (1) project identification sign, located at each point of project ingress and egress, not to exceed thirty-two (32) square feet in area, may be erected on the project site. No other signs shall be installed other than safety signs and the required warning signs. The developer shall submit a sign elevation drawing to the Planning Director for review and approval prior to installation.
- 19.64.140(L): A minimum of on-site roadways shall be constructed. Temporary access roads utilized for initial machine installation shall be revegetated to a natural condition after completion of machine installation. The applicant shall submit a plan of all proposed roads, temporary and permanent, for approval by the Planning Director prior to the issuance of any building permits.
- 19.64.140(N): Wind project facilities shall be encircled with a ten- (10-) foot-wide fuel break. Subject fuel breaks may be installed for each wind machine or the perimeter of the total project, but in no event shall encompass more than forty (40) acres per block. Permanent access roads may also be considered fuel breaks. This requirement may be modified at the discretion of the Kern County Fire Chief.
- 19.64.140(O): No building permits will be issued until the grading has been completed in accordance with the approved plans and "As Graded Certification" has been made by the engineer.

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, commercial wind farms, 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. Government Code Section 51238(a)(1) of the Williamson Act provides that: “unless the board or council after notice and hearing makes a finding to the contrary, the erection, construction, alteration or maintenance of…electric…facilities are hereby determined to be compatible uses within any agricultural preserve.” Commercial wind-driven electrical generators are considered as “electric facilities.”

6.5.3 Impact Analysis

This section explains how potential impacts to Agriculture associated with development of the TWRA (including the proposed Alta Wind Project) are assessed. Section 6.5.3.1 presents the significance criteria upon which impact determinations are based. This section also briefly describes the methodology for determining the type and degree of impact that would be produced as a result of TWRA development. All impacts and mitigation measures identified for development of the TWRA are presented in Section 6.5.3.2.

6.5.3.1 Criteria for Determining Impact Significance

The Kern County CEQA Implementation Document and Kern County Environmental Checklist state that a project (including the proposed Alta Wind Project) would have a significant impact on agricultural resources if it would:

- Criterion TWRA AG1: 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;
- Criterion TWRA AG2: Conflict with existing zoning for agricultural use or a Williamson Act contract;

- Criterion TWRA AG3: Involve other changes in the existing environment which, because of their location or nature, could result in conversion of Farmland to nonagricultural use; or
- Criterion TWRA AG4: Result in the cancellation of an open space contract made pursuant to the California Land Conservation Act of 1965, Williamson Act contract, or Farmland Security Zone contract for any parcel of 100 or more acres.

6.5.3.2 Impacts and Mitigation Measures

The following section describes potential impacts and mitigation measures related to Agricultural Resources that could occur as a result of future wind project development within the TWRA, including the proposed Alta Wind Project. A summary of identified impacts and associated mitigation measures for the TWRA is presented in Table 6.20-1.

Conversion of Prime or Unique Farmland or Farmland of Statewide Importance to Nonagricultural Use (Criterion TWRA AG1)

As previously discussed and depicted in Figure 6.5.1, based on the most current data available from the California Division of Land Resource Protection Farmland Mapping and Monitoring Program, there is no Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) within the Tehachapi Wind Resource Area. The area is composed entirely of lands classified as "other land" and "grazing land." Thus, potential proposed projects would not convert Important Farmland to nonagricultural uses. This impact would be less than significant.

Conflicts with Williamson Act Contract Lands (Criterion TWRA AG2)

Impact TWRA-AG-1: Future wind development would remove some Williamson Act contract lands from agricultural use.

As shown in Figure 6.5.1, the programmatic wind development area includes 34,368 acres of lands that are subject to Williamson Act contracts. In the event wind farms are developed, some of this land would be permanently affected by future projects. Assuming that future wind projects would use 1 to 3 MW turbines, it is estimated that approximately 1,190 to 3,570 turbines would be required and would require from 450 up to 1,350 acres which would be covered by concrete foundations or other permanent stabilizing treatment, thereby removing it from agricultural use.

Under the Williamson Act, Kern County is authorized to approve compatible uses of non-prime land if the use will not significantly alter or degrade the long-term productivity of agricultural lands in the project area or adjacent areas or remove a significant amount of land from agricultural or open land uses or otherwise degrade or impair current and future agricultural activities. The Williamson Act contains the generic criteria for determining compatibility of other uses with agriculture in Government Code Section 51238.1. Section 51238(a)(1) of the Williamson Act further provides that: "unless the board or council after notice and hearing makes a finding to the contrary, the erection, construction, alteration or maintenance of electric facilities are hereby determined to be compatible uses within any agricultural preserve." Commercial wind-driven electrical generators are "electric facilities."

As discussed in the PdV EIR, given the height and dispersed nature of most wind turbines, existing agricultural uses can continue in conjunction with wind energy generation. In particular, potential projects would not significantly compromise the long-term productive agricultural capability of the land (Gov. Code §51238.1[a][1]). As shown in Figure 6.5.1, the primary agricultural use of the area is for stock

grazing. Thus, this land does not have large agricultural productive capabilities. Projects would remove a small portion of the available property from agricultural use; however, the majority of available lands would continue to be used for stock grazing.

Stock grazing is not traditionally a high-income-producing agricultural use, and development pressures could cause some properties to be sold and taken out of agricultural production. Leasing property for wind development projects would help supplement some of the property owner's income from grazing, allowing the land to remain in agricultural production. This supplemental income would also further the Williamson Act contract's goal for this property to "discourage premature and unnecessary conversion of such land from agricultural uses."

Mitigation Measures for Impact TWRA-AG-1

TWRA-AG-1: Prior to construction of any wind turbine on a parcel of land subject to a Williamson Act Land Use contract, the applicant shall submit a written site description, along with a plot plan, for review and approval to the Kern County Planning Department. This submittal is in addition to the required WE plot plan review. The site-specific description shall include the qualifying agricultural use and quantification of the amount of land that would no longer be available for that use.

CEQA Significance Conclusion

Land in the TWRA does not have large agricultural productive capabilities. Projects would remove a small portion (less than 1 percent) of the available property from agricultural use; however, the majority of available lands would continue to be used for stock grazing. Implementation of Mitigation Measure TWRA-AG-1 would ensure that impacts would be less than significant (Class II).

Conversion of Farmland to Nonagricultural Use (Criterion TWRA AG3)

Impact TWRA-AG-2: Future wind development would remove some lands from agricultural use.

In order to estimate the potential area that would be required for future wind farms, the National Renewable Energy Laboratory (NREL) Wind Farm Area Calculator was used (http://www.nrel.gov/analysis/power_ databook/calc_wind.php, accessed 3/06/2008). This calculator estimates land-area requirements and provides a footprint of the land that would be taken out of production to provide space for turbine towers, roads, and support structures. The typical footprint is between 0.25 and 0.50 acre per turbine. This does not include the spacing required between wind turbines; however, for agricultural purposes this land would remain available for agricultural use. Implementation of potential wind projects would permanently convert land designated for agricultural use to nonagricultural use where aboveground project facilities would be installed. It is assumed that between 1,190 and 3,570 turbines would be needed for full development of the TWRA requiring from 450 up to 1,350 acres.

This would represent less than 1 percent of agricultural land in the TWRA that would be permanently disturbed and converted to nonagricultural use. Current agricultural and grazing activities in the remaining 99 percent of the area could continue after construction.

CEQA Significance Conclusion

For most potential wind development projects, a limited portion of the total project area would be converted to nonagricultural use. However, the land within the TWRA area that would be converted to

non-agricultural use is not Prime Farmland, Unique Farmland, or Farmland of Statewide Importance; therefore, the impact is considered to be less than significant and mitigation is not required (Class III). Further, the projects would not change the existing base zone of Exclusive Agriculture, thereby preserving the land for agricultural use. Finally, at the end of the various projects lifespan, infrastructure would be removed and the land disturbed by the projects would be restored to agricultural use.

Cancellation of Open Space Contracts (Criterion TWRA AG4)

Impact TWRA-AG-3: Future wind development would result in the Cancellation of an Open-Space Contract, Williamson Act Contract, or Farmland Security Zone.

As described above, the TWRA is in conformance with the California Land Conservation Act of 1965 and is not covered by any open space contract or Farmland Security Zone. Additionally, only the landowner can petition to cancel a contract. To approve a tentative contract cancellation, a county or city must make specific findings that are supported by substantial evidence. The existence of an opportunity for another use of the property is not sufficient reason for cancellation. In addition, the uneconomic character of an existing agricultural use shall not, by itself, be a sufficient reason to cancel a contract.

CEQA Significance Conclusion

The potential for development of the TWRA to result in the cancellation of an open-space contract, Williamson Act contract, or farmland security zone is considered to be a less than significant impact and no mitigation would be required (Class III).

6.6 Air Quality

This section presents information on ambient air quality conditions in the TWRA as shown in Figure 6.2-2 and identifies potential impacts to air quality as a result of the construction and operation of potential wind development projects. A description of the Affected Environment for Air Quality is presented below in Section 6.6.1, followed by a description of Applicable Laws, Regulations, and Standards in Section 6.6.2, and the Impact Analysis presented in Section 6.6.3.

6.6.1 Affected Environment

The TWRA and the proposed Alta Wind Project area are located in the Kern County Air Pollution Control District (KCAPCD) jurisdiction within the Mojave Desert Air Basin (MDAB), and encompass more than 269,000 acres.

The climate of eastern Kern County is characterized by hot, dry summers and mild to cold winters with seasonally heavy precipitation that occurs primarily during the winter months. Summer typically has clear skies, high temperatures, and low humidity. A monthly climate summary for Mojave, California, was selected to characterize the climate of the study area. As described in Table 6.6-1, average summer (June-August) high and low temperatures in the study area are 97°F to 62°F, respectively. Average winter (December-March) high and low temperatures in the study area are 66°F to 33°F, respectively. The average annual precipitation is approximately 6.6 inches with over 70 percent occurring between December and March. Little precipitation occurs during summer because a high-pressure cell blocks migrating storm systems over the eastern Pacific. The prevailing strong winds in the MDAB are generally out of the west and southwest (AVAQMD, 2002).

Table 6.6-1. Monthly Average Temperatures and Precipitation

Month	Mojave		
	Temperature, °F		Precipitation Inches
	Maximum	Minimum	
January	58	34	1.34
February	62	37	1.51
March	66	41	1.13
April	72	46	0.22
May	81	54	0.15
June	91	62	0.05
July	97	67	0.16
August	96	66	0.27
September	90	59	0.28
October	79	49	0.28
November	66	39	0.43
December	58	33	0.81

Source: The Weather Channel 2006.
Note: Averaged over a minimum period of 30 years.

Existing Air Quality

The United States Environmental Protection Agency (USEPA), California Air Resources Board (CARB), and the local air districts classify an area as attainment, unclassified, or nonattainment depending on whether or not the monitored ambient air quality data shows compliance, insufficient data available, or non-compliance with the ambient air quality standards, respectively. The National and California Ambient Air Quality Standards (NAAQS and CAAQS) relevant to the TWRA are provided in Table 6.6-2.

Table 6.6-2. National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards
Ozone (O_3)	1-hour	0.09 ppm	—
	8-hour	0.070 ppm	0.08 ppm
Respirable particulate matter (PM10)	24-hour	50 µg/m^3	150 µg/m^3
	Annual mean	20 µg/m^3	50 µg/m^3
Fine particulate matter ($PM_{2.5}$)	24-hour	—	65 µg/m^3
	Annual mean	12 µg/m^3	15 µg/m^3
Carbon monoxide (CO)	1-hour	20 ppm	35 pm
	8-hour	9.0 ppm	9 ppm
Nitrogen dioxide (NO_2)	1-hour	0.25 ppm	—
	Annual mean	—	0.053 ppm
Sulfur dioxide (SO_2)	1-hour	0.25 ppm	—
	3-hour		0.5 ppm
	24-hour	0.04 ppm	0.14 ppm
	Annual mean	—	0.03 ppm

Notes: ppm=parts per million; µg/m^3= micrograms per cubic meter; "—" = no standard
Source: CARB 2006a, Ambient Air Quality Standards Table.

The wind resource area is located within the MDAB, under the jurisdiction of the KCAPCD. Ozone, NO_2, PM10, and PM2.5 are currently recorded at the Mojave Poole Street monitoring station.

Table 6.6-3 summarizes the federal and State attainment status of criteria pollutants for Kern County based on the NAAQS and CAAQS, respectively.

Table 6.6-3. Attainment Status for Kern County - MDAB

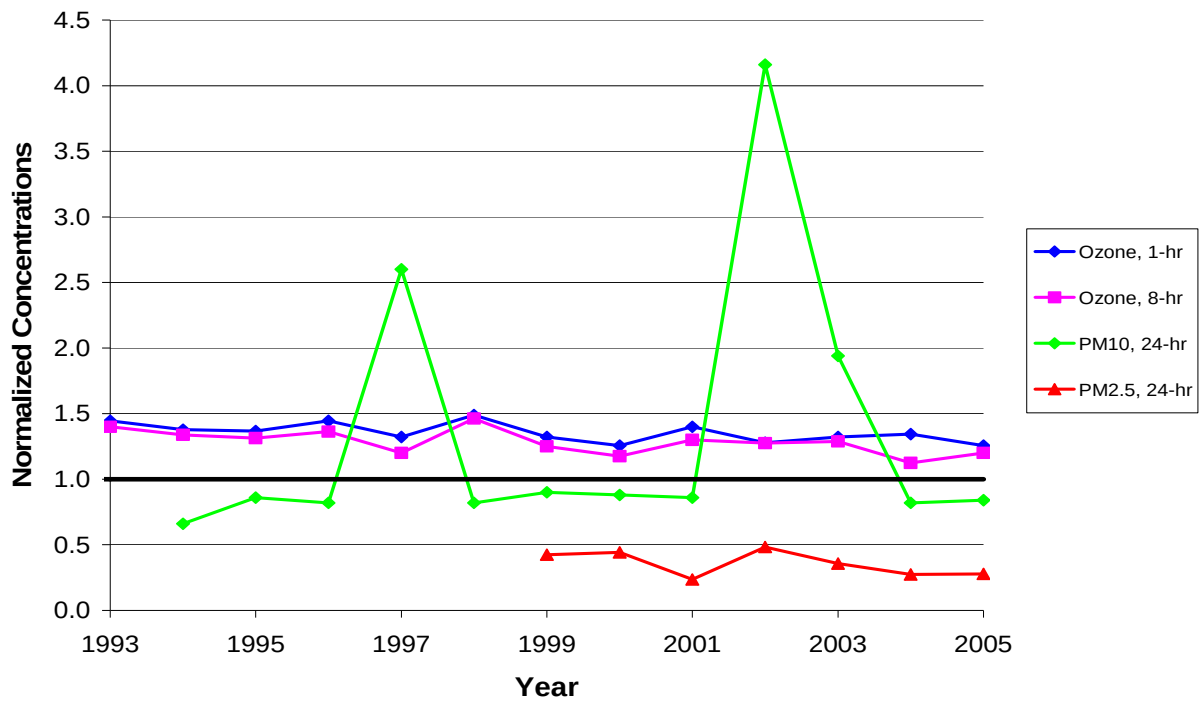
Pollutant	Attainment Status Kern County Portion of the MDAB	
	Federal	State
Ozone – 1 Hour	N/A	Moderate Nonattainment
Ozone – 8 Hour	Nonattainment	Not Available[a]
CO	Unclassified/Attainment	Attainment
NO_2	Unclassified/Attainment	Attainment
SO_2	Attainment	Attainment
PM10	Attainment	Nonattainment
PM2.5	Attainment	Unclassified

Source: CARB 2006b, USEPA 2006

[a]The attainment status of the California 8-hour ozone standards, promulgated in 2005, have not yet been determined.

Figure 6.6-1, below, summarizes the historical air quality data for the area collected at the air quality monitoring station in Mojave.

Figure 6.6-1. Normalized Maximum Short-term Historical Air Pollutant Concentrations in Mojave



Source: CARB 2006c.

As shown in Figure 6.6-1, the TWRA has ambient concentrations above the State 1-hour and 8-hour ozone standards and the State 24-hour PM10 standard, while the TWRA is below the ambient concentrations for the federal 24-hour PM2.5 standard.

All available data for 1993 to 2005 from the Mojave 923 Poole Street monitoring station was used to create Figure 6.6-1. Normalized concentrations represent the ratio of the highest measured concentrations in a given year to the most-stringent currently applicable national or State ambient air quality standard. Therefore, normalized concentrations lower than one indicates that the measured concentrations were lower than the most-stringent ambient air quality standard.

Ozone

In the presence of ultraviolet radiation, both NO_x and VOCs go through a number of complex chemical reactions to form ozone. Table 6.6-4 summarizes the best representative ambient ozone data for the area collected over the past ten years from monitoring stations in the western MDAB. The table includes the maximum hourly concentration and the number of days above the national and State standards. As indicated in this table, ozone formation is generally higher in spring and summer and lower in the winter. The Kern County portion of the MDAB in the wind resource area is classified as extreme and moderate nonattainment areas, for the 1-hour CAAQS. The Kern County portion of the MDAB in the wind resource area is classified as moderate and basic nonattainment areas, for the 8-hour NAAQS. Classifications for the 8-hour ozone CAAQS have not yet been determined.

The long-term trends for ozone concentrations have shown some reduction since the mid 1980's; however, since the mid 1990's the trend has been fairly flat and ozone continues to be above the State 1-hour and federal 8-hour ozone standards. The western MDAB is primarily impacted by ozone and ozone precursor pollutants transported from the metropolitan Los Angeles area (South Coast Air Basin [SCAB]) and the San Joaquin Valley Air Basin (SJVAB). The long-term trends in ozone pollutant levels in the western MDAB are inexorably tied to the reduction in ozone precursor pollutant levels in these two upwind air basins.

Table 6.6-4. Ozone Air Quality Summary 1995-2005

Year	Days Above NAAQS 1-Hr	Days Above CAAQS 1-Hr	Month of Max. 1-Hr Avg.	Max. 1-Hr Avg. (ppm)	Days Above NAAQS 8-Hr	Month of Max. 8-Hr Avg.	Max. 8-Hr Avg. (ppm)
	Mojave - 923 Poole Street						
1995	0	33	AUG	0.123	30	AUG	0.105
1996	2	46	AUG	0.130	42	MAY	0.109
1997	0	22	DEC	0.119	19	JUN	0.096
1998	2	43	JUL	0.134	40	JUL	0.117
1999	0	39	SEP	0.119	34	JUL	0.100
2000	0	25	JUL	0.113	15	JUL	0.094
2001	1	33	AUG	0.126	32	AUG	0.104
2002	0	18	JUL	0.115	26	JUL	0.102
2003	0	31	JUL	0.119	27	JUN	0.103
2004	0	8	SEP	0.121	3	JUN	0.090
2005	0	8	JUN	0.113	9	JUN	0.096

Source: CARB 2006c.
California Ambient Air Quality Standard (CAAQS): 1-hr, 0.09 ppm
National Ambient Air Quality Standard (NAAQS): 1-hr, 0.12 ppm; 8-hr, 0.08 ppm

Carbon Monoxide (CO)

CO is generally found in high concentrations only near a significant source of emissions (i.e., freeway, busy intersection, etc.). The highest concentrations of CO occur when low wind speeds and a stable atmosphere trap the pollution emitted at or near ground level in what is known as the stable boundary layer. These conditions occur frequently in the wintertime late in the afternoon, persist during the night and may extend one or two hours after sunrise. Since mobile sources (motor vehicles) are the main cause of CO, ambient concentrations of CO are highly dependent on motor vehicle activity. In fact, the peak CO concentrations occur during the rush hour traffic in the morning and afternoon. Carbon monoxide

concentrations in the State have declined significantly due to two statewide programs: (1) the 1992 wintertime oxygenated gasoline program, and (2) Phase I and II of the reformulated gasoline program. Additionally, overall vehicle fleet turnover from higher-emitting older engines to lower-emitting new engines is a significant factor in the declining CO levels.

Table 6.5-5 summarizes the best representative ambient carbon monoxide data for the wind resource area collected over the past ten years from Lancaster monitoring stations. The table includes the available maximum 1-hour and 8-hour concentrations.

Most of the potential wind resource area would be expected to have lower CO levels than those presented in Table 6.6-5, as the area is not located near dense population centers and would experience minimal or no nearby vehicle traffic, which is the major contributor to CO emissions. As indicated in the table, there have been no exceedances of CAAQS or NAAQS since at least 1995 for the 1-hour and the 8-hour CO standards in Lancaster.

Table 6.6-5. Carbon Monoxide Air Quality Summary 1996-2005

Year	Maximum 1-Hr Avg. (ppm)	Month of Max. 8-Hr Avg.	Maximum 8-Hr Avg. (ppm)
	Lancaster – West Pondera Street		
1996	6.8	DEC	4.69
1997	5.9	DEC	3.99
1998	5.4	DEC	3.59
1999	7.2	JAN	5.41
2000	6.0	DEC	4.34
2001	---	JAN	3.33
	Lancaster – 43301 Division Street		
2002	---	SEP	2.24
2003	---	DEC	1.88
2004	---	JAN	1.72
2005	---	DEC	1.54

Source: CARB 2002, CARB 2006c.
California Ambient Air Quality Standard (CAAQS): 1-hr, 20; 8-hr, 9.0 ppm
National Ambient Air Quality Standard (NAAQS): 1-hr, 35 ppm; 8-hr, 9 ppm

Nitrogen Dioxide (NO_2)

The majority of the NO_x emitted from combustion sources is in the form of NO, while the balance is mainly NO_2. NO is oxidized by O_2 (oxygen) in the atmosphere to NO_2 but some level of photochemical activity is needed for this conversion. This is why the highest concentrations of NO_2 often occur during the fall and not in the winter. While winter atmospheric conditions favor the trapping of ground level releases of NO there is a lack of significant radiation intensity (less sunlight) to oxidize NO to NO_2. In the summer, the conversion rates of NO to NO_2 are high, but the relatively high temperatures and windy conditions (atmospheric unstable conditions) disperse pollutants, preventing the accumulation of NO_2 to levels approaching the 1-hour ambient air quality standard. NO is also oxidized by O_3 to form NO_2. The formation of NO_2 in the summer with the help of the ozone occurs according to the following reaction:

$$NO + O_3 \rightarrow NO_2 + O_2$$

In urban areas, ozone concentration level is typically high. That level will drop substantially at night as the above reaction takes place between ozone and NO. This reaction explains why, in urban areas, ozone concentrations at ground level drop, while aloft and in downwind rural areas (without sources of fresh NO_x emissions) ozone concentrations can remain relatively high.

Table 6.6-6 summarizes the best representative ambient nitrogen dioxide data for the TWRA collected over the past ten years from western MDAB monitoring stations. The table includes the maximum 1-hour and annual concentrations. As indicated in the table, there have been no exceedances of California Ambient Air Quality Standards or National Ambient Air Quality Standards since at least 1996 for the 1-hour and the annual NO_2 standards. The MDAB is either unclassified or in attainment for nitrogen dioxide.

Table 6.6-6. Nitrogen Dioxide Air Quality Summary 1996-2005

Year	Month of Max. 1-Hr Avg.	Maximum 1-Hr Avg. (ppm)	Maximum Annual Avg. (ppm)
	Mojave – 923 Poole Street		
1996	AUG	0.075	0.009
1997	DEC	0.075	0.010
1998	AUG	0.082	0.011
1999	SEP	0.083	0.010
2000	FEB	0.071	0.010
2001	SEP	0.071	0.010
2002	NOV	0.071	0.009
2003	FEB	0.073	0.009
2004	OCT	0.064	0.008
2005	na	na	na

Source: CARB 2006c.
California Ambient Air Quality Standard (CAAQS): 1-hr, 0.25 ppm
National Ambient Air Quality Standard (NAAQS): Annual, 0.053 ppm

Inhalable Particulate Matter (PM10)

PM10 can be emitted directly or it can be formed many miles downwind from emission sources when various precursor pollutants interact in the atmosphere. Gaseous emissions of pollutants like NO_x, SO_x, VOC, and ammonia, given the right meteorological conditions, can form particulate matter in the form of nitrates (NO_3), sulfates (SO_4), and organic particles. These pollutants are known as secondary particulates, because they are not directly emitted, but are formed through complex chemical reactions in the atmosphere.

Table 6.6-7 (on the following page) summarizes the ambient particulate matter data collected from the western MDAB monitoring stations. The table includes the maximum 24-hour and annual arithmetic average concentrations.

As shown in Table 6.6-7, the area experiences exceedances of the State and 24-hour PM10 standards and the State annual arithmetic mean PM10 standards. The western MDAB in is unclassified for the federal PM10 standard and in nonattainment of the State PM10 standard.

There has been an overall gradual downward trend for PM10 concentrations and number of exceedances of the California 24-Hour Standard; however, there has been little or no further progress since 1993. Additionally, meeting the revised PM10 annual arithmetic mean State standard of 20 $\mu g/m^3$ will pose an even greater challenge than meeting the former annual geometric mean State standard of 30 $\mu g/m^3$.

Fine Particulate Matter (PM2.5)

Table 6.6-8 summarizes the ambient fine particulate matter data collected over the past seven years from the western MDAB monitoring stations. The MDAB is unclassified for both the federal and State PM2.5 standards.

Table 6.6-7. Particulate Matter Air Quality Summary 1996-2005

Year	Days * Above Daily NAAQS	Days * Above Daily CAAQS	Month of Max. Daily Avg.	Max. Daily Avg. (μg/m³)	State Annual Arithmetic Mean (μg/m³)
	Mojave – 923 Poole Street				
1996	0	0	AUG	41	16.9
1997	6	0	AUG	130	18.4
1998	0	0	APR	41	15.0
1999	0	0	SEP	45	17.7
2000	0	---	OCT	44	---
2001	0	0	JUN	43	18.2
2002	7	7	OCT	208	21.4
2003	0	12	FEB	97	19.3
2004	0	0	SEP	41	18.3
2005	---	---	SEP	42	---

Source: CARB 2006c.
California Ambient Air Quality Standard (CAAQS): 24-hr, 50 μg/m³; annual arithmetic, 20 μg/m³
National Ambient Air Quality Standard (NAAQS): 24-hr, 150 μg/m³; annual arithmetic, 50 μg/m³
* Days above the State and national standard (calculated): Because PM10 is monitored approximately once every six days, the potential number of exceedance days is calculated by multiplying the actual number of days of exceedance by six.

Table 6.6-8. Fine Particulate Matter Air Quality Summary 1999-2004

Year	Month of Max. Daily Avg.	Max. Daily Avg. (μg/m³)	98th Percentile of Max. Daily Avg. (μg/m³)	Days Above 98th Percentile Daily NAAQS	3-Yr. Avg. 98th Percentile of Max. Daily Avg. (μg/m³)	National Annual Avg. (μg/m³)	3-Yr. Avg. of National Annual Avg. (μg/m³)
	Mojave – 923 Poole Street						
1999	FEB	27.6	---	0	---	---	---
2000	DEC	28.7	---	0	---	---	---
2001	MAY	15.3	13.9	0	---	6.1	---
2002	OCT	31.4	---	0	---	---	---
2003	NOV	23.2	---	0	---	---	---
2004	JUN	17.8	---	0	---	---	---
2005	JUL	18.1	---	0	---	---	---

Source: CARB, 2006c.
National Ambient Air Quality Standard: 3-Year Average - 98th Percentile of 24-Hr Avg. Conc., 65 μg/m³.
3-Year Average of Annual Arithmetic Mean (National Annual Average), 15 μg/m³; 3-Year Average of Annual Arithmetic Mean (State Annual Average), 12μg/m³.

Sulfur Dioxide (SO_2)

Sulfur dioxide is typically emitted as a result of the combustion of a fuel containing sulfur. Fuels such as natural gas contain very little sulfur and consequently have very low SO_2 emissions when combusted. By contrast, fuels high in sulfur content such as coal or heavy fuel oils can emit very large amounts of SO_2 when combusted. Sources of SO_2 emissions come from every economic sector and include a wide variety of fuels, gaseous, liquid and solid.

The MDAB is designated attainment or unclassified for all SO_2 State and federal ambient air quality standards. There are no monitoring stations within the MDAB west of Victorville/Trona; therefore, no representative SO_2 ambient air quality data exists. There is however, one in Burbank south of the San Gabriel Mountains, where no exceedances of the SO_2 CAAQS or NAAQS have been observed between

1985 and 2005. Additionally, the Victorville and Trona SO_2 monitoring stations have not shown any exceedances of the SO_2 CAAQS or NAAQS between 1985 and 2005 (CARB, 2006c).

Summary

As discussed above and presented in Table 6.6-3, the area is in nonattainment of the State ozone and PM10 standards, and the federal 8-hour ozone standard. The area is designated as attainment and/or unclassified for all other criteria pollutant standards. The area's attainment status is significantly influenced by pollutant transport from both the south (South Coast Air Basin, i.e., Los Angeles area) and the west (San Joaquin Valley Air Basin). The long-term trends in pollutant levels in the western MDAB are inexorably tied to the reduction in pollutant levels in these two upwind air basins.

Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill and the chronically ill, especially those with cardio-respiratory diseases. Construction impacts from potential projects will be localized and will be limited to short periods of time at the turbine sites. The localized short-term impacts are greatest to those located adjacent or very close to construction sites. Sensitive receptors located more than 500 feet from construction sites will have limited exposure times and concentrations, so only the sensitive receptors located within 500 feet of construction sites are considered those with potentially significant pollutant exposure.

Residential areas are also considered to be sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Recreational land uses are considered moderately sensitive to air pollution. Although exposure periods are generally short, exercise places a high demand on respiratory functions, which can be impaired by air pollution. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial and commercial areas are considered the least sensitive to air pollution. Exposure periods for industrial/commercial areas are relatively short and intermittent, as the majority of the workers tend to stay indoors most of the time. In addition, the working population is generally the healthiest segment of the public.

Alta Wind Project

The Alta Wind Project is located within the southern portion of the TWRA. The setting described above for the TWRA applies to the Alta Wind Project site as well. The proposed Alta Wind project would be located entirely within the jurisdiction of the Kern County Air Pollution Control District (APCD), in the Mojave Desert Air Basin. The Kern County APCD is a nonattainment area for the State and federal and ozone standards and the State particulate matter (PM10) standard. The nearest sensitive receptors to the proposed Alta Wind Project site are homes and residences, approximately 390 feet from the northwest portion of the site, or approximately 470 feet from where the closest WTG would be constructed. There are also residences within approximately 800 to 1,800 feet from where WTGs would be constructed on the southwest portion of the site. Other sensitive receptors are residences located between two to three miles to the northeast, east, and southeast of the eastern portion of the site.

6.6.2 Applicable Laws, Regulations, and Standards

Potential wind development projects would include construction but would not include any stationary emission sources, so there are very few direct air quality regulations that specifically regulate the air

quality emission sources for wind development. The regulations that do apply, such as fugitive dust regulations, tend to be general and allow multiple means of achieving compliance. A description of the specific and general regulations that apply to development of the TWRA (including the proposed Alta Wind Project) is provided below.

6.6.2.1 Federal

The United States Environmental Protection Agency (USEPA) has issued a number of National Ambient Air Quality Standards (NAAQS). Pollutants regulated under these standards include ozone, nitrogen dioxide (NO_2), carbon monoxide (CO), respirable particulate matter (PM10), fine particulate matter (PM2.5), and sulfur dioxide (SO_2).

USEPA has a number of other regulations under the authority of the federal Clean Air Act (such as New Source Review (NSR), Prevention of Significant Deterioration (PSD), Title V permitting program, etc.); however, none of these regulations apply to operation of wind facilities because they would have no operating stationary emission sources. The USEPA does have on-road and off-road engine emission reduction programs that indirectly affect a project's emissions through the phasing in of cleaner on-road and off-road equipment engines.

6.6.2.2 State

CARB has issued a number of California Ambient Air Quality Standards (CAAQS). These standards include pollutants not covered under the NAAQS and also require more stringent standards than provided under the NAAQS. Pollutants regulated under these standards include ozone, nitrogen dioxide (NO_2), carbon monoxide (CO), respirable particulate matter (PM10), fine particulate matter (PM2.5), sulfur dioxide (SO_2), lead, sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles.

CARB, like USEPA, also has on-road and off-road engine emission reduction programs that indirectly affect a project's emissions through the phasing in of cleaner on-road and off-road equipment engines. Additionally, CARB has a Portable Equipment Registration Program that allows owners or operators of portable engines and associated equipment to register their units under a Statewide portable program to operate their equipment, which must meet specified program emission requirements, throughout California without having to obtain individual permits from local air districts.

6.6.2.3 Local

The TWRA (including the proposed Alta Wind Project) is located in the KCAPCD. The local jurisdiction is responsible for planning, implementing, and enforcing federal and State ambient standards within their jurisdictions. The regulations are focused on stationary sources; therefore, most of the local agency regulations are not relevant to wind development. However, portable engines used during construction that are larger than 50 hp and that are not registered under the CARB Portable Equipment Registration Program would need to obtain permits from the KCAPCD.

Project construction will need to comply with visible emissions, nuisance, and fugitive dust regulations. The specific regulations are as follows:

KCAPCD Rule 401 – Visible Emissions

KCAPCD Rule 402 – Fugitive Dust

KCAPCD Rule 419 – Nuisance

These rules limit the visible dust emissions from the project construction sites, prohibit emissions that can cause a public nuisance, and require the prevention and reduction of fugitive dust emissions. One or more measures are required by the Fugitive Dust rules reduce fugitive dust emissions from specific dust causing activities. These measures may include, adding freeboard to haul vehicles, covering loose material on haul vehicles, watering, using chemical stabilizers and/or ceasing all activities (such as during periods of high winds).

6.6.3 Impact Analysis

At the time this analysis was conducted, no information was available on potential future wind development projects other than the PdV Wind Energy Project described in Section 6.2.2.2. As a result, the environmental analysis presented here assumes that issues and impacts would be similar to those discussed in the environmental impact report completed for the PdV Wind Energy Project (see Appendix A). Since most wind development projects would be located within the same general vicinity and would be designed to perform a similar function it is reasonable to assume that the parameters and assumptions used for the PdV Wind Energy Project would generally be applicable to future wind development projects.

Summary of PdV Wind Energy Project Assumptions and Impact Conclusions for Air Quality

The technical report provided in Appendix B, PdV Wind Project Air Quality Analysis, of the PdV Wind Energy Project EIR describes the calculations, methodology, and assumptions used to estimate the air pollutant emissions from construction and operation of the proposed PdV Wind Energy Project. Three categories of emission sources were assessed:

- Vehicle and equipment exhaust;
- Fugitive dust, which includes concrete batch plant operations; and
- Asphalt paving emissions.

The PdV Wind Energy Project analysis was based on the following likely three phases of project construction:

- Construction Phase I (Phase I): Ten months of construction to include the installation of up to 256 1 megawatt (MW) turbines (total capacity 256 MW), and construction of associated facilities, roads, construction yards, and underground utility lines;
- Construction Phase II (Phase II): Four months of construction to include installation of up to 44 1 MW turbines (total capacity 44 MW) and construction of associated facilities; and
- Operations: 30-year period during which the wind power would be generated and routine operation and maintenance activities would be conducted.

As discussed and concluded in the PdV Wind Energy Project EIR technical report Appendix B, construction (but not operation) of the project would result in exceedance of emissions significance thresholds for PM10, NO_x, and ROG. The PdV Wind Energy Project analysis included air emissions calculations for both before and after the incorporation of mitigation measures. The mitigation measures included those typically required by Kern County for NO_x (use of off-road equipment with Tier I or Tier II engines) and PM10 (watering program for dust control).

The air quality impacts of the future proposed wind projects are discussed below under subheadings corresponding to each of the significance criterion. The analysis describes the impacts of the proposed projects related to air quality and, for each criterion, determines whether the proposed projects would result in significant impacts

6.6.3.1 Criteria for Determining Impact Significance

CEQA allows for the significance criteria established by the applicable air quality management or air pollution control district to be used to assess impacts of a project on air quality. The KCAPCD has established regional thresholds of significance for construction activities and for project operations as shown below.

For this analysis, development of the TWRA (including the proposed Alta Wind Project) may result in significant impacts if it would:

- Criterion TWRA AIR1: Conflict with or obstruct implementation of the applicable air quality plan;
- Criterion TWRA AIR2: Violate any air quality standard as adopted in (c)I, (c)ii, or as established by the EPA or air district or contribute substantially to an existing or projected air quality violation;
- Criterion TWRA AIR3: 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 that exceed quantitative thresholds for ozone precursors).

  Specifically, implementation of the project would have a significant impact on air quality if it would exceed any of the following KCAPCD adopted thresholds:[1]

  – Operational and area sources:

  ROG – 25 tons per year.

  NO_x – 25 tons per year.

  PM10 – 15 tons per year.
- Criterion TWRA AIR4: Expose sensitive receptors to substantial pollutant concentrations;
- Criterion TWRA AIR5: Create objectionable odors affecting a substantial number of people.

6.6.3.2 Impacts and Mitigation Measures

The following section describes potential impacts and mitigation measures related to Air Quality that could occur as a result of future wind project development within the TWRA, including the proposed Alta Wind Project. A summary of identified impacts and associated mitigation measures for the TWRA is presented in Table 6.20-1.

Conflict with or Obstruct Implementation of the Applicable Air Quality Plan (Criterion TWRA AIR1)

Impact TWRA-AQ-1: During construction, future wind development would exceed established emission thresholds and, therefore, would conflict with the Air Quality Management Plan.

Potential projects would be located in the MDAB under the jurisdiction of the KCAPCD. The District is responsible for developing those portions of the State Implementation Plan (SIP), and the Air Quality Management Plan (AQMP), that deal with certain stationary and area source controls and, in cooperation with the transportation planning agencies (TPAs), the development of transportation control measures (TCMs). The California Air Resources Board (CARB) is responsible for submitting the SIP to USEPA.

[1] Note that ozone and PM2.5 are not included. Ozone is not directly emitted from stationary or mobile sources; rather it is formed as the result of chemical reactions in the atmosphere between directly emitted air pollutants, specifically oxides of nitrogen (NOx) and hydrocarbons (VOCs). Therefore, it cannot be directly regulated. PM2.5 is not included as it is currently in the beginning stages of becoming regulated, and as such, PM2.5 significance thresholds have not yet been developed.

The eastern Kern County portion of the MDAB is designated as non-attainment for both federal (8-hour) and State (1-hour) ozone and state PM10 standards. All other criteria pollutants (NO2, and SO2, and PM2.5) are considered to be in attainment by the State, and in attainment and/or unclassified under federal standards.

During construction, the PdV Wind Energy Project, the Alta Wind Project, and other potential projects would exceed the significance thresholds for CO, ROGs, NO_x, sulfur oxides, PM10, and PM2.5 emissions established in the KCAPCD guidelines for implementing CEQA and as adopted by the Kern County Board of Supervisors (see Impact TWRA-AQ-2 below). Therefore, construction of the potential projects could conflict with applicable air quality plans.

Project operation would not result in significant emissions and, therefore, would not conflict with applicable air quality plans. Operations would not exceed the thresholds; therefore, implementation of the project would not obstruct implementation of an air quality plan during operation.

Mitigation Measures for Impact TWRA-AQ-1

TWRA-AIR-1: The applicant shall develop a Fugitive Dust Control Plan in compliance with KCAPCD Rule 402 to reduce PM10 and PM2.5 emissions during construction. The Fugitive Dust Control Plan shall include:

a. Name(s), address(es), and phone number(s) of person(s) responsible for the preparation, submission, and implementation of the plan;

b. Description and location of operation(s);

c. Listing of all fugitive dust emissions sources included in the operation; and

d. Implementation of the following dust control measures shall be implemented:

   i. 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.

   ii. 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.

   iii. All material transported off-site will be either sufficiently watered or securely covered to prevent excessive dust.

   iv. 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.

   v. Areas disturbed by clearing, earth moving, or excavation activities will be minimized at all times.

   vi. Stockpiles of dirt or other fine loose material will be stabilized by watering or other appropriate method to prevent wind-blown fugitive dust.

   vii. 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.

   viii. All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.

   ix. Traffic speeds on unpaved roads shall be limited to 25 mph.

TWRA-AIR-2: The applicant shall reduce exhaust emissions during construction and, in particular, emissions of NO_x, when using construction equipment and vehicles by implementing the following measures:

a. Prohibit the use of heavy-equipment during first- or second-stage smog alerts and suspend all construction activities during second-stage smog alerts;

b. Maintain equipment engines in proper working order;

c. Limit the hours of operation of heavy-duty equipment and/or the amount of equipment in use to the extent feasible;

d. During all grading and construction activities at least 10% of diesel engine–driven construction equipment on site shall be equipped with Tier 1 or Tier 2 as certified by the CARB or with engines certified by the KCAPCD to provide equivalent benefits. At least 40 percent of the remaining diesel engine–driven construction equipment shall have diesel particulate filters and lean-NO_x catalysts (or equivalent control devices);

e. The owner/operator will require that all diesel engines be shut off when not in use to reduce emissions from idling;

f. Require that trucks and vehicles in loading or unloading queues have their engines turned-off when not in use; and

g. Equip any generators, compressors, or other stationary sources of emissions located within 100 feet of a residence or other sensitive receptor with a control system to reduce normal exhaust emissions.

TWRA-AIR-3: The applicant shall educate construction personnel on the health effects of exposure to criteria pollutant emissions.

TWRA-AIR-4: The applicant shall provide construction workers with personal protective equipment such as respiratory equipment (masks), if requested by the worker to reduce exposure to pollutants and Valley Fever. The applicant shall provide all construction personnel and visitors to the project site with information regarding Valley Fever. This would facilitate recognition of symptoms of Valley Fever and earlier treatment.

CEQA Significance Conclusion

Construction

Since future wind projects within the TWRA have not been developed as yet, it is assumed that air quality impacts from the PdV Wind Energy Project would be similar for future wind project within the TWRA as well. Construction of future wind projects would result in emissions of the air pollutants CO, ROGs, NO_x, sulfur oxides, PM10, and PM2.5. Emissions from construction would result from fuel combustion and exhaust from construction equipment and vehicle traffic, grading, and use of toxic materials (e.g., paints and lubricants). Therefore, it is reasonable to assume that temporary emissions of NO_x (an ozone precursor) and PM10 during construction would exceed the KCAPCD thresholds adopted by Kern County, but emissions during project operations would not exceed KCAPCD thresholds. Temporary emissions of these pollutants during construction are considered significant and even with mitigation, temporary emissions during construction would remain significant.

Mitigation measures were identified in the PdV EIR to reduce the production of PM10, PM2.5, and NO_x from construction activities. However, during construction; these emissions would still exceed the KCAPCD significance threshold. Therefore, future wind projects would likely result in impacts similar to that of the PdV Wind Energy Project and would be expected to have a temporary but significant and unavoidable impact on air quality during construction (Class I).

Operation

As discussed and concluded in the PdV EIR, wind facility operation would not result in significant emissions and, therefore, would not conflict with applicable air quality plans. It is assumed that operations of potential future projects will be similar to existing projects, therefore, they would not exceed the thresholds; would not obstruct implementation of an air quality plan during operation.

Violation of Air Quality Standards or Contribution to Air Quality Violations (Criterion TWRA AIR2)

Impact TWRA-AQ-2: Future wind development would result in temporary emissions of NO_X and PM10 during construction and would exceed the KCAPCD thresholds.

As discussed earlier, specific wind development projects have not been identified; however, it is assumed that air quality impacts from the PdV Project would be similar for future projects as well. Construction of the wind development projects would result in emissions of the air pollutants CO, ROGs, NO_x, sulfur oxides, PM10, and PM2.5. As discussed above, emissions from construction would result from fuel combustion and exhaust from construction equipment and vehicle traffic, grading, and use of toxic materials (e.g., paints and lubricants). Therefore, it is reasonable to assume that potential projects would result in temporary emissions of NO_x (an ozone precursor) and PM10 during construction and would exceed the KCAPCD thresholds adopted by Kern County. But emissions during project operations would not exceed KCAPCD thresholds. As noted in Table 3 the KCAPCD is in moderate nonattainment for the state 1-hour ozone standard and nonattainment for PM10. Therefore, temporary emissions of these pollutants during construction are considered significant and mitigation would be required. However, as described below, even with mitigation, temporary emissions during construction would remain significant.

Mitigation Measures for Impact TWRA-AQ-2

Mitigation Measures TWRA-AIR-1 and TWRA-2 identified above would reduce the production of PM10, PM2.5, and NO_x from construction activities. However, during construction; these emissions would still exceed the KCAPCD significance threshold. Therefore, potential projects would likely result in impacts similar to that of the PdV project and would be expected to have a temporary but significant and unavoidable impact on air quality during construction.

CEQA Significance Conclusion

Implementation of the mitigation measures TWRA-AIR-1 and TWRA-AIR-2 would reduce impacts due to construction activities; however, even with mitigation, impacts during construction would be significant and unavoidable (Class I). Operation of the wind development projects would not exceed KCAPD thresholds and, therefore, this impact would not be significant for operations (Class III).

Violation of KCAPCD Adopted Thresholds (Criterion TWRA AIR3)

Impact TWRA-AQ-3: Future wind development construction would result in cumulatively considerable net increases of NO_X and PM10.

Impacts due to wind development project construction would be similar to those stated for the PdV Project and would result in significant emissions of NO_x and PM10 pollutants for which the KCAPCD and surrounding air districts of the San Joaquin Valley are in nonattainment. Construction emissions would also result in a cumulatively considerable net increase. However, because projects would not result in significant operational emissions of criteria pollutants, the projects would not contribute to a long-term

cumulative increase in criteria pollutants. In fact, projects could result in a positive cumulative benefit to air quality in the region as it would introduce a non-fossil fuel-based energy source.

Mitigation Measures for Impact TWRA-AQ-3

Mitigation Measures TWRA-AIR-1 and TWRA-2 identified above would reduce PM10 and PM2.5 and NO_x emissions during construction and potential project would conform with the goals, policies, and implementation measures of the Kern County General Plan and the WE Combining District impacts during construction would remain significant and unavoidable.

CEQA Significance Conclusion

Since operation of wind development projects would not contribute to a long-term cumulative increase in criteria pollutants, this impact is considered less than significant for operations (Class III). Mitigation measures for construction were identified above. However, it was concluded that even with mitigation, construction impacts would be cumulatively significant and unavoidable for potential projects (Class I).

Exposure of Sensitive Receptors to Substantial Pollutant Concentrations (Criterion TWRA AIR4)

Impact TWRA-AQ-4: Sensitive receptors would be exposed to substantial pollutant concentrations during construction.

Sensitive receptors are persons who may be particularly sensitive to air pollution because they are ill, elderly, or have lungs that are not fully developed. Locations where such persons reside, spend considerable amounts of time, or engage in strenuous activities are also referred to as "sensitive receptors." Typical sensitive receptors include inhabitants of long-term healthcare facilities, rehabilitation centers, convalescent centers, retirement homes, residences, schools, playgrounds, childcare centers, and athletic facilities. Potential projects would have a significant impact on ambient air quality only during construction. Since the specific locations of each future wind development project are not known, sensitive receptors that may be affected by proposed projects will not be determined until the beginning of the environmental review process for each individual project. However, they could include hikers, individuals at residences near the project site during construction phases. Impacts on sensitive receptors, particularly from dust, would vary depending on the level and type of activity, the silt content of the soil, and prevailing weather.

The majority of the wind resource project area is in remote mountainous, agricultural, or desert areas that do not have substantial numbers of sensitive receptors. A portion of the Pacific Crest Trail which is designated as a National Scenic Trail traverses the project area and extends to the north and south. Properties are mostly undeveloped and include scattered wind farms, mining operations, a cement plant and open space.

Pollutant emissions would be distributed over the construction period, would not be concentrated in any one area, and would be reduced through mitigation. Projects would, however, expose construction workers to criteria pollutants, which could result in adverse health effects, and mitigation would be required. Associated with exposure to PM10 is potential exposure to Valley Fever, which is known to occur in soils in Kern County. As described under "Valley Fever" in the PdV EIR, there is the potential that cocci spores would be stirred up during excavation, grading, and earth-moving activities, exposing construction workers to these spores and thereby to the potential of contracting Valley Fever. When a person who is not immune to Valley Fever inhales these airborne spores, they enter the lungs and cause

respiratory infections such as pneumonia. Implementation of the proposed mitigation measures would reduce the concentrations of pollutants and spores to which workers are exposed.

No substantial pollutant concentrations would be generated during operation of wind development projects.

Mitigation Measures for Impact TWRA-AQ-4

TWRA-AIR -3: The applicant shall educate construction personnel on the health effects of exposure to criteria pollutant emissions.

TWRA-AIR -4: The applicant shall provide construction workers with personal protective equipment such as respiratory equipment (masks), if requested by the worker to reduce exposure to pollutants and Valley Fever. The applicant shall provide all construction personnel and visitors to the project site with information regarding Valley Fever. This would facilitate recognition of symptoms of Valley Fever and earlier treatment.

CEQA Significance Conclusion

Since no substantial pollutant concentrations would be generated during operation of wind development projects, this impact is considered less than significant for operations (Class III). For construction of wind development projects, assuming implementation of Mitigation Measures TWRA-AIR-3 and TWRA-AIR-4, this impact can be mitigated to a less-than-significant level (Class II).

Objectionable Odors (Criterion TWRA AIR5)

Impact TWRA-AQ-5: Future wind development construction would create objectionable odors.

Odor emissions from wind development project construction and operation would be limited to odors associated with vehicle and engine exhaust and fueling. Given the size of the TWRA and strong prevailing winds in the area, these odors would be dispersed and would not create significant objectionable odors. Because there are few permanent residences in the project vicinity, fueling odors during construction would not affect a substantial number of people. Therefore, potential proposed projects are not expected to result in significant impacts on air quality related to objectionable odors (Class III).

Mitigation Measures for Impact TWRA-AQ-5

No mitigation measures would be required.

CEQA Significance Conclusion

Since this is a rural area and few permanent residences exist in the project vicinity, fueling odors during construction would not impact a substantial number of people and this impact is considered less than significant (Class III).

6.7 Biological Resources

As described in the Introduction, the TWRA is located at the southern end of the San Joaquin Valley, the northern Antelope Valley, and the western Mojave Desert; and portions of the TWRA fall within the foothills of the Sierra Nevadas and the Tehachapi Mountains. The TWRA is located in an unincorporated area of southeastern Kern County, approximately 80 miles north of the City of Los Angeles.

A description of the Affected Environment is presented in Section 6.7.1, and includes discussion of the data collection methodology and the regional setting relevant to Biological Resources in the TWRA. Section 6.7.2 provides a list of the applicable laws, regulations, and standards. Section 6.7.3 provides a general impact analysis that addresses the types of impacts commonly associated with wind development in this region, and appropriate mitigation to reduce those impacts.

6.7.1 Affected Environment

The Affected Environment section provides a general description of the baseline biological conditions of the TWRA. The data collection methodology for biological resources is provided below (Section 6.7.1.1) as well as a description of the regional setting (Section 6.7.1.2). Vegetation types within the TWRA are described for the purpose of characterizing the botanical resources and wildlife habitat values. Biotic habitats suitable for the occurrence of plant and wildlife species of special status (State and federally listed threatened and endangered species, federal candidate species, California Native Plant Society List species, and BLM Sensitive species) are also described.

6.7.1.1 Baseline Data Collection Methodology

Data collection was conducted through review of the following resources: aerial photographs, the California Department of Fish and Game (CDFG) California Natural Diversity Database (CNDDB), and previously prepared reports and regional planning documents (general plan policies, Habitat Conservation Plans [HCPs], and Environmental Impact Reports [EIRs]).

The study area was defined as the area within the identified boundaries of the TWRA, as presented in Figure 6.7-1. The current general condition and quality of these biological resources was used as the baseline against which to compare potential impacts of the development of wind generation projects throughout the TWRA. Surveys were not conducted as specific project details are as yet unknown, and much of the TWRA contains privately owned lands that are inaccessible for reconnaissance surveys. Therefore, the affected environment description focuses on review of the literature, CNDDB database, and aerial photographs to characterize the biological resources present.

6.7.1.2 Regional Setting

The TWRA is located in southeastern Kern County and includes a diversity of topography, ranging from high desert floor in the southern area to mountain passes and steep slopes of the Tehachapi Mountains and Sierra Nevada foothills in the north. Elevation ranges from 2,500 feet to approximately 8,000 feet above mean sea level.

The TWRA encompasses a vast area that includes the boundary between two ecoregions – the Mojave Basin and Range and the Southern California Mountains ecoregions (see Figure 6.7-1). Most of the TWRA falls within the Mojave Basin and Range ecoregion. This ecoregion is characterized by scattered, generally low-elevation mountains. Vegetation consists primarily of creosote bush scrub. Much of this ecoregion is federally owned and there is relatively little grazing activity. Some areas have experienced severe wind and water erosion problems linked to extensive OHV use (USEPA, 2002).

The TWRA also includes portions of the Southern California Mountains ecoregion. The climate in this ecoregion consists of the Mediterranean climate of hot, dry summers and moist, cool winters. Although Mediterranean types of vegetation such as chaparral and oak woodlands predominate, the elevations are considerably higher in this region, the summers are slightly cooler, and precipitation amounts are greater, causing the landscape to be more densely vegetated and stands of ponderosa pine to be larger and more

numerous than in the adjacent regions. Severe erosion problems are common where the vegetation cover has been destroyed by fire or overgrazing (USEPA, 2002). Because the TWRA is situated at the boundary between these two ecoregions, there is a variety of species and vegetation communities that occur within the TWRA.

For purposes of this analysis, the TWRA is evaluated regionally with respect to discussions of sensitive habitats and special-status plant and animal species. The southern portion of the TWRA is discussed in Section 6.7.1.2.1 and the northern portion of the TWRA is discussed in Section 6.7.1.2.2 (see Figure 6.7-2).

Southern Portion of the TWRA

The southern portion of the TWRA is located in the Antelope Valley of the western Mojave Desert (Figure 6.7-1). The southern portion extends from the southern foothills of the Tehachapi Mountains south into the Antelope Valley west of the City of Mojave and abuts the eastern boundary of Tejon Ranch. The southern portion ranges in elevation from approximately 2,580 feet in the center of the Antelope Valley, to approximately 3,500 feet at the northern boundary. This region receives an average of 4 to 9 inches of annual rainfall, and annual temperatures average 62°F. The Antelope Valley is an internally-drained basin bordered by the San Gabriel Mountains to the south and Tehachapi Mountains to the west. Surface flows from these mountainous watersheds drain into Rosamond Lake as sheet flow or within natural and artificial channels.

Vegetation

Plant communities in the southern region of the TWRA are varied and reflect the wide geographic range of the area. Please see the PdV EIR and Biological Resources Technical Report (Kern County, 2007) and the TRTP Biological Technical Report for a detailed discussion of the vegetation community types identified in the southern area of the TWRA.

Much of the southern portion of the TWRA is characterized by a gradually sloping alluvial plateau crossed by numerous desert washes, with several rocky hillocks scattered along the plain. Mining operations, grazing, OHV use, camping, hunting, and scattered development, including wind farms, all occur in the general area.

A large portion of the vacant, open lands present on the valley floor and the lower portions of the foothills are dominated by non-native annual grasses such as cheatgrass (*Bromus tectorum*), ripgut brome (*Bromus diandrus*), foxtail barley (*Hordeum jubatum*), wild oats (*Avena fatua*), and fescue (*Vulpia microstachys*). Within these non-native grasslands, ruderal species such as black mustard (*Brassica nigra*), Russian thistle (*Salsola tragus*), and curly dock (*Rumex crispus*) also occur. Anthropogenic disturbance is ubiquitous; debris piles, old appliances, and disturbance from off-road vehicle use are present. These areas are unsuitable for supporting most native species due to their highly disturbed soils and the dominance of non-native species.

Much of the alluvial plateau near the foothills of the Tehachapi Mountians is dominated by Mojave creosote bush (*Larrea tridentata*) scrub with scattered Joshua trees (*Yucca brevifolia*), and portions of the study area support Joshua tree woodland. Desert bunchgrass (*Nassella* spp.) grasslands also occur in scattered areas.

Numerous small drainages support desert wash habitat in the area. Desert wash habitat is a limited resource in the Antelope Valley. Although this unique hydrogeomorphic landform is relatively common in

parts of the Antelope Valley, much of this habitat has been lost over the last several decades due to development and agricultural practices, particularly in undeveloped portions of the Project area where off-road vehicle paths and paved roads transect desert washes. Desert wash habitats play an important role in conveying surface flows during the rainfall season to other habitats located downslope that support special-status plants such as the alkali mariposa lily.

The Los Angeles Aqueduct crosses from northeast to southwest through the southern portion of the study area. The Aqueduct is underground through the region, and is identified in many locations by the concrete cover that provides protection to the Aqueduct. Access vaults occur at regular intervals along the length of the Aqueduct. In some locations, windrows of soil, likely excess spoil from the construction of the waterway are present. A dirt access road parallels the aqueduct, and is subject to periodic blading for road maintenance. Numerous other dirt roads crisscross the area and appear to be used primarily by OHV recreationists, hunters, and local residents. A railway spur is located through this portion of the study area that runs east-west from a cement manufacturing plant located west of the project area to the rail head in Mojave. A few scattered residences are also located in the general vicinity of the proposed wind farm.

Habitat disturbance in this area is primarily due to the construction of roads, the Aqueduct, and the railroad. Grazing pressures currently appear moderate to low, although grazing was likely abundant in the region historically. Disturbance in xeric or desert habitats can have long term consequences to desert ecosystems and result in the colonization of non-native species including noxious weeds. Desert ecosystems in the Antelope Valley are especially sensitive to ground disturbance and can take decades to recover, if at all. For example, disturbance from military exercises conducted in desert ecosystems during the Second World War remains visible to this day. In the project area evidence of disturbance from the construction of the California Aqueduct is clearly visible. Vegetation along the margins of the aqueduct and many access roads are colonized by rubber rabbitbrush and brome grasses, plants that are well adapted to disturbance and can exclude the recruitment of species that previously occupied those areas. Species such as creosote bush and Joshua tree are not present in these disturbed areas but were clearly present at the site prior to the construction of the Aqueduct. Thus, the restoration of native plant communities in this area would be difficult or impossible to achieve due to the extremely long time frame for establishment of these dominant plant communities.

The western part of the southern portion of the TWRA is located in the foothills of the Tehachapi Mountains. Mojave juniper woodland and scrub with scattered Joshua trees and creosote bush is common in the mid elevations, while foothill pine/oak woodland occurs at the higher elevations. Joshua tree and juniper woodland habitats support unique assemblages of plant and wildlife species, and despite the acreage that occurs in the study area, vast acreages of these habitats have been lost over the last several decades due to urbanization and agricultural activities in the Antelope Valley. While other desert plant communities lack vertical structure and shade, these habitats provide important structural characteristics for mammals and avian species. Additionally, unlike herbaceous or shrub-based habitats, arid woodlands are extremely slow developing, with mature juniper and pinyon woodlands requiring as much as 150 years (Wangler and Minnich, 1996) to reach full maturity.

Annual grasslands are abundant at the higher elevations and support a variety of both native and exotic plant species.

The Oak Creek drainage runs northeast to southwest through the middle of southern portion of the TWRA and supports southern cottonwood willow riparian forest. This habitat, as well as southern willow scrub, is also present in the smaller tributary drainages that occur throughout the area. In California more than

95 percent of riparian habitats that were present prior to European settlement have been severely degraded or destroyed (Smith, 1977; Katibah, 1984). While these habitats constitute only a small fraction of the TWRA area and a low percentage of the total landscape (often less than one percent), they typically accommodate a disproportionately high number of species and provide a larger degree of ecological function than surrounding upland areas (Fischer and Fischenich 2000). Many aquatic and semi-aquatic species rely on adjacent terrestrial habitats to complete their life cycles (Semlitsch and Bodie, 2003; Spinks et al., 2003; Burke and Gibbons, 1995) and riparian vegetation provides necessary foraging and nesting habitat for many bird species (Rottenborn, 1999; Bolger et al., 1997). In arid regions such as Southern California, riparian habitats play a particularly crucial role in maintaining biodiversity because up to 80 percent of vertebrate species rely on them for at least part of their lifecycle (Knopf et al. 1988) and because of the central role riparian habitats play in a variety of ecological functions (Fischer and Fischenich, 2000; Rottenborn, 1999).

The southern portion contains several existing wind farms. Much of this region appears to be subject to grazing from both cattle and horses. California annual grassland is present where grazing pressures appear to be moderate to high and along roads that serve the wind farms. Habitat disturbance due to the construction of the wind farms, access roads, grazing, and scattered residential uses appears to be moderate. The Pacific Crest Trail, a popular hiking trail, crosses through the northwestern portion of the study area.

Some of the habitat present in the foothills south of Oak Creek Road has been burned by recent wild fires. This is evident in the areas to the west of Tehachapi-Willow Springs Road. Intact Mojave juniper woodland and scrub is present in this area along the east side of the road. Small rocky outcrops are scattered along the hillsides in this region and are likely utilized by a variety of small rodents, ground nesting birds, and reptiles.

The most common vegetation type in the southern portion of the TWRA is Mojave creosote brush scrub. Disturbed annual grassland is the second most common vegetation type in the region, especially within developed wind farms. These grasslands were previously fallow agricultural fields dominated primarily by cheat grass (*Bromus tectorum*) and other non-native grasses and occasionally interspersed with rubber rabbit brush (*Chrysothamnus nauseosus*). The third most abundant vegetation type is Mojave juniper woodland and scrub, especially in the foothills of the Tehachapi Mountains. Other relatively common vegetation types within the region include Mojave mixed woody scrub, desert bunchgrass mix, and desert saltbush scrub in the Antelope Valley, and mixed chaparral in the foothills of the San Gabriel Mountains.

Sensitive or regulated habitats that occur in the southern portion include southern cottonwood willow riparian forest (along Oak Creek), Joshua tree woodland, and southern willow scrub. The USGS National Wetland Inventory (NWI) maps depict numerous, small (0.3 to 1.0 acre) inland marshes and wetlands that may be temporarily flooded, particularly within the northern area of the southern portion of the TWRA.

Wildlife

Surveys conducted in June, 2006 for other projects in the area identified several common and rare wildlife species. Within the southern portion of the TWRA, non-native annual grassland, Mojave juniper woodland and scrub, creosote bush scrub, and Joshua tree woodland all provide suitable breeding and foraging habitats for a variety of common and rare herpetofauna. Amphibian and reptile species observed and expected in the southern portion of the TWRA include:

- Pacific tree frog (*Hyla regilla*)
- western toad (*Bufo boreas*)
- western blind snake (*Leptotyphlops humilis*)
- desert night lizard (*Xantusia vigilis*)

- western fence lizard (*Sceloperus occidentalus*)
- gopher snake (*Pituophis catenifer*)
- western rattlesnake (*Crotalus viridis*)
- common kingsnake (*Lampropeltis getula*)
- side-blotched lizard (*Uta stansburiana*)
- common garter snake (*Thamnophis sirtalis*)
- night snake (*Hypsiglena torquata*)
- racers (*Coluber constrictor*)
- long-nosed snake (*Rhinocheilus lecontei*)
- desert iguana (*Dipsosaurus dorsalis*)
- glossy snake
- California whipsnake
- spotted leaf-nosed snake (*Phyllorhynchus decurtatus*)
- western patch-nosed snake (*Salvadora hexalepis*)
- lyre snake (*Trimorphodon biscutatus*).

Numerous resident and migratory bird species are expected in the TWRA. The entire TWRA lies within the Pacific Flyway, one of four major North American migratory routes. Spring and winter migrants are common in the area. Various species utilize every habitat type present in the area, and the presence of the riparian Oak Creek drainage and tributaries provide suitable nesting and foraging habitat for many resident species. Bird species expected to occur in the project area include:

- western meadowlark (*Sturnella neglecta*)
- horned lark (*Eremophila alpestris*)
- long-billed curlews (*Numenius americanus*)
- mountain bluebirds (*Sialia currucoides*)
- savannah sparrow (*Passerculus sandwichensis*)
- lark sparrow (*Chondestes grammacus*)
- white-crowned sparrow (*Zonotrichia leucophrys*)
- vesper sparrow (*Pooecetes gramineus*)
- western kingbirds (*Tyrannus verticalis*)
- California quail (*Callipepla californica*)
- burrowing owl (*Athene cunnicularia*)
- lesser nighthawk (*Chordeiles acutipennis*)
- sage sparrow (*Amphispiza belli canescens*)
- migrant or wintering Brewer's (*Spizella breweri*), chipping (*Spizella passerina*) sparrows
- verdin (*Auriparus flaviceps*)
- LeConte's thrasher (*Toxostoma lecontei*)
- black-throated sparrow (*Amphispiza bilineata*).

The raptors foraging in agricultural fields within the vicinity would also forage in non-native annual grasslands and scrub located in the TWRA.

The project area is expected to support a variety of nocturnal and diurnal rodent species. Grasslands, scrub, desert washes, and riparian areas all provide suitable foraging and breeding habitat for various species. Rodent species expected to occur include:

- *California ground squirrel*
- *house* mouse
- Tehachapi pocket mouse (*Perognathus alticolus inexpectatus*)
- Merriam's kangaroo rat (*Dipodomys merriami*)
- white-tailed antelope ground squirrel (*Ammospermophilus leucurus*)
- desert cottontail (*Sylvilagus audobonii*)
- black-tailed jack rabbit (*Lepus californicus*)
- desert pocket mouse (*Chaetodipus penicillatus*)
- southern grasshopper mouse (*Onychomys torridus*)
- Tulare grasshopper mouse (*Onychomys torridus tularensis*)
- chisel-toothed kangaroo rat (*Dipodomys microps*)
- Mojave ground squirrel (*Spermophilus mohavensis*)

Common predators utilizing the area may include American badger (*Taxidea taxus*), kit fox (*Vulpes macrotis*), gray fox (*Urocyon cinereoargenteus*), coyote (*Canis latrans)*, bobcat (*Lynx rufus*), red-tailed hawk, and other raptors. Areas with short grasses provide foraging opportunities for the pallid bat (*Antrozous pallidus*). Large predators such as mountain lion (*Felis concolor*) or black bear (*Ursus americanus*) may enter the northern parcels on their way down from the Tehachapi Mountains, and would be expected to be drawn to the Oak Creek drainage due to the abundance of prey and water.

Several species of bats are expected to occur in the southern portion of the TWRA due to the presence of rocky outcrops, and trees and water in the Oak Creek drainage. Bats could forage over a variety of habitats in the area, including non-native annual grassland, various scrub communities, and riparian areas or desert washes. Bat species expected to occur in the project area include:

- big brown bat (*Eptesicus foscus*)
- western pipistrelle (*Pipistrellus hesperus*)

- big free-tailed bat (*Nyctinomops macrotis*)
- Townsend's big-eared bat (*Corynorhinus townsendii*)
- pallid bat (*Antrozous pallidus*)
- long-legged myotis (*Myotis volans*)
- California myotis (*Myotis californicus*)

Alta Wind Project

The proposed Alta Wind Project is a large, approximately 600 MW to 800 MW wind development project proposed in the TWRA. The Alta Wind Project would be located in the central region of the southern portion of the TWRA. At this time, only the parcels requiring a zone change by Kern County have been identified, and the extent of development within these parcels is unknown. Please see Figure 6.2-2 for the location of these parcels.

Vegetation types occurring in the Alta project area are representative of those described above for the southern portion of the TWRA. Wildlife such as those species described above would also be expected to occur in the Alta Wind Project area. Special-status species such as Mojave ground squirrel, California condor, and golden eagle are likely present in the project area. The Alta Wind Project will require detailed, project-specific environmental analysis to identify impacts and mitigation to reduce those impacts.

Northern Portion of the TWRA

The northern portion of the TWRA is situated within the southernmost foothills of the Sierra Nevada (Figure 6.7-2). This region is bounded to the south by the Mojave Desert and to the east by the Fremont Valley. The northern portion ranges in elevation from approximately 3,200 feet at the eastern boundary to 6,000 feet at the northwest boundary. This area receives on average 30 inches of precipitation annually at 5,000 feet (Schoenherr, 1992).

Two major drainages in the northern portion are Jawbone Canyon and Pine Tree Canyon, both of which drain to the Fremont Valley to the east of the TWRA. The majority of the northern portion is undeveloped, but extensive livestock grazing has disturbed much of the area.

Vegetation

The northern portion of the TWRA is located in the foothills of the southern Sierra Nevadas. This region is primarily open space, with little development. The most notable development in the area consists of several scattered wind farms located on ridgelines in the southern area of this region. Few roads provide access into the area, and those that are present are dirt roads; many of which are associated with the wind farms. Several riparian areas are evident on aerial photographs, but without surveys the plant assemblages within those areas cannot be determined. A number of small reservoirs and washes are located in the general region as well.

Large areas of land in the northern portion of the TWRA are privately owned, thereby limiting opportunities for vegetation community surveys. The surveys that have been previously conducted on public lands have indicated that there are seven general vegetation types that occur in the northern portion of the TWRA. These include scrubs, chaparrals, wetlands, grasslands and fields, woodlands, ecotones, and developed/disturbed areas (see the Pine Tree Wind Development Biological Technical Report/Biological Assessment: EDAW, 2004)

Scrub communities are typically dominated by a suite of low-statured, aromatic, drought-deciduous shrub and sub-shrub species. Composition can vary substantially depending on physical determinants such as

soil characteristics and climate, and successional stage. Scrub communities are generally associated with well-drained soils and usually occur along southern slopes, alluvial fans, and valleys throughout the region. The scrub communities that occur in the northern portion of the TWRA include blackbush scrub, brittlebush scrub, rabbitbrush scrub, big sagebrush scrub, Mojave mixed woody scrub, and Mojave creosote brush scrub.

In the northern portion of the TWRA, semi-desert chaparral is the only chaparral community that has been identified during surveys. Semi-desert chaparral typically occurs on dry, rocky, steep slopes at elevations ranging from 2,000 – 5,000 feet and is characterized by 4 – 12 foot tall shrubs, including chamise (*Adenostoma fasciculatum*), California buckwheat (*Eriogonum fasciculatum*), California juniper (*Juniperus californica*), and various manzanitas (*Arctostaphylos* spp.). This community is less prone to fire than typical chaparral communities due to lower fuel loads (Holland, 1986).

Wetland communities in the northern portion of the TWRA include Mojave desert wash scrub, Mojave riparian forest, and southern riparian scrub. These communities are all considered "rare" by the CDFG and "worthy of consideration" by the CNDDB (CNDDB, 2007). Mojave desert wash scrub and Mojave riparian forest are associated with fine-grained, sandy-bottomed, shallow washes and rivers. These communities have been identified along Jawbone and Pine Tree Canyon washes and tributaries. Southern riparian scrub occurs along river channels and tributaries throughout the region. This community is inclusive and may be used to describe mulefat scrub or southern willow scrub depending on species composition.

Grasslands in the northern portion of the TWRA consist of two types, perennial grasslands and annual grasslands. Perennial grasslands are restricted to bunchgrass grasslands that occur in limited areas. This community is characterized by perennial bunchgrass (*Nassella pulchra*) and is sparsely covered by shrub species and associated annual species (*Bromus* spp., *Avena* spp., and *Erodium* spp.). Native grasslands communities are considered sensitive by CDFG. Annual grasslands are typically characterized by a dense to sparse cover of non-native species that occur on fine-textured, usually clay soils (Holland, 1986). Annual grasslands communities can be found throughout foothills and valleys in the northern portion of the TWRA. Previous surveys have also identified wildflower fields in this portion of the project area which are characterized by a dense cover of annual wildflowers. Species composition varies in these communities from site to site and year by year. Similar to grasslands, wildflower fields are typically distributed throughout foothills and valleys in the project area. Wildflower fields are most commonly associated with poor quality, low-nutrient soils (Holland, 1986).

Several woodland communities occur throughout the northern portion of the TWRA. The most common woodland community in this portion is Mojavean juniper woodland and scrub. This community is dominated by California juniper with a diverse understory that typically includes rabbitbrush, blackbush, and California buckwheat. Other juniper associated communities that occur in the region include oak-pinyon-juniper woodland, juniper-oak woodland, foothill pine-pinyon-juniper-oak woodland, oak-foothill pine-juniper woodland, and pinyon-juniper woodland. These communities typically occur in areas dominated by xeric soils, steep slopes, and rocky outcrops. Open foothill pine (*Pinus sabiniana*) woodland, blue oak (*Quercus douglasii*), Mojavean pinyon woodland, Joshua tree woodland, and desert peach (*Prunus andersonii*) woodland also occur in the northern portion of the TWRA. These communities are dominated by their respective species. Woodland communities in this portion are also represented by series of varying composition and dominant species. These include foothill pine-oak woodland, oak-pinyon woodland, and foothill pine-pinyon-oak woodland. Among the woodland communities occurring in

the northern portion of the TWRA, Joshua tree woodland is considered "rare" by the CDFG and "worthy of consideration" by the CNDDB (CNDDB, 2007).

Ecotones are ecological gradient zones where a transitional intergrade occurs between two distinct vegetation communities and species associated with both communities are present. Those occurring in the northern portion of the TWRA include ecotonal Mojavean juniper woodland/Mojave mixed woody scrub and ecotonal Mojavean juniper woodland/blackbush scrub.

Developed and disturbed lands typically consist of areas that have been disced, cleared, or otherwise altered. These areas may include roadways, existing structures, and agricultural fields. Development in this portion is characterized by existing, paved roadways and several ranch properties that are scattered throughout the region. Disturbed areas include unpaved access roads and agricultural fields that are also present throughout the region. Ongoing cattle grazing is a common practice in some disturbed areas in this portion. Developed and disturbed lands typically lack native vegetation and are dominated by introduced exotics or ornamentals.

Wildlife

Given the overall size of the northern portion of the TWRA and the occurrence of various vegetation communities, the area would be expected to support a vast assemblage of wildlife species. Many of the same wildlife species that would be expected in the southern portion of the TWRA would also be expected in the northern portion. Herpetofauna expected to occur in this portion include desert horned lizard (*Phrynosoma platyrhinos*), great basin whiptail (*Aspidoscelis tigris tigris*), long-nosed leopard lizard (*Gambelia wislizenii),* and California toad (*Bufo boreas halophilus*). Surveys for the Pine Tree Wind Development near the eastern border of the northern portion of the TWRA detected desert tortoise individuals, eggshells, burrows, and scat in 2003 (EDAW, 2004).

Many species of birds are expected to forage over the hills and utilize riparian areas and desert washes, including migrants. Species that likely occur in this region include northern harrier (*Circus cyaneus*), golden eagle (*Aquila chrysaetos*), red-tailed hawk (*Buteo jamaicensis*), mountain quail (*Oreorytx pictus*), California quail (*Callipepla californica*), chukar (*Alectoris chukar*), scrub jay (*Aphelocoma californica*), black-throated sparrow, and sage sparrow.

A diverse assemblage of mammals are also expected to utilize the northern portion of the TWRA. Large mammals especially would be able to use this area due to a lack of extensive development and the fact that this area is contiguous open space into the Sierra Nevadas. Mule deer (*Odocoileus hemionus*) are likely quite abundant in this region. Species observed during surveys for the Pine Tree Wind Development include American black bear, bobcat, and Tule elk (*Cervus elaphus nannodes*) (EDAW, 2004). Mountain lions also likely occur, preying on mule deer and other prey species occurring in the region. Bat species such as long-legged mytois likely occur here as well, especially associated with riparian areas.

Special-Status Species

Due to the expansive size of the overall project area, assessments for special-status species were approached by analyzing the northern and southern portions as separate and distinct project areas. It is important to note that the boundary between the two portions is arbitrary and many of the special-status species could potentially occur in suitable habitats across the entire project area. While many of the habitat types available to plant and wildlife species are contiguous across this arbitrary boundary, areas in each portion are characterized by unique geographic and topographic features and distinct vegetation

communities. Therefore, there are a variety of special-status species that may possess a different potential to occur in each of the project areas.

It is also important to note that, due to private property constraints, large areas of open space have not been subjected to previous survey efforts. This is particularly true in the northern portion. As a result, data for these areas is limited and much of the analysis is based on the best information available at the time of this report. This includes the CNDDB Rarefind Database, CNPS Online Inventory, previous technical reports and EIR/EISs, aerial imagery, maps, and known ranges, distributions, and habitats for each special-status species.

The potential for special-status species was ranked based on the following criteria:

- Present: Has been observed within the project areas during previous surveys or there are known records within the project areas within the past twenty years.
- High: Both a historical record exists within the project areas or their immediate vicinities (within five miles) and the project areas support (or are assumed to support) suitable habitat conditions.
- Moderate: Either a historical record exists within the immediate vicinities of the project areas (approximately ten miles) or suitable habitat conditions occur in those vicinities.
- Low: No records exist within the project areas or their immediate vicinities (approximately ten miles) and/or the environmental conditions (including soil type and elevation factors) are marginal within the project areas.
- Not likely to Occur: No known records exist and the project areas lack suitable habitat requirements (including soil and elevation factors).

Vegetation

Table 6.7-1 lists federal and State listed plant species, species on List 1, 2, 3, or 4 of the California Native Plant Society (CNPS), BLM sensitive species, and species covered under the West Mojave Plan that may occur in or near the proposed project area. Each of these species was assessed for its potential to occur within the project areas based on the criteria discussed above.

Table 6.7-1. Special Status Plant Species with the Potential to Occur in the TWRA

Name	Status	Habitat Association and Elevation Limits	Potential to Occur		Known and Potential Occurrence in the Project Area
			Southern	Northern	
Alkali mariposa lily *Calochortus striatus*	CNPS List 1B.2, BLM, WMP	Alkali seeps, clay soils within chenopod scrub. In the Lancaster area, associated with "dune and pan" microtopography within the natural floodplain of Rosamond Lake.	High	High	Southern: Known to occur at Lookout Hill less than five miles east of project site (CNDDB, 2007). Suitable habitat exists in alkaline soils within Mojave Creosote Bush Scrub or Desert Saltbush Scrub. Northern: Has been documented in the Kelso Valley less than five miles from project area (CNDDB, 2007). Suitable habitat extends into the project area.
Aromatic canyon gooseberry *Ribes mensziesii* var. *ixoderme*	CNPS List 1B.2	Chaparral, cismontane woodlands; 610-1160 m	Moderate	Moderate	Southern: Not known to occur in project area; however, project area supports suitable habitat. Northern: Has been historically documented near Caliente Canyon west of project area (CNDDB, 2007). Suitable habitat may remain intact and extend into project area.
Baja navarretia *Navarretia peninsularis*	CNPS List 1B.2	Chaparral, lower montane coniferous forest; mesic openings; 1500-2300 m	Moderate	Low	Southern: Historically known from Water Canyon less than one mile from project area. Suitable remains intact and extends into project area. Northern: No known records occur and only limited suitable habitat has been identified in the project area.

Table 6.7-1. Special Status Plant Species with the Potential to Occur in the TWRA

Name	Status	Habitat Association and Elevation Limits	Potential to Occur		Known and Potential Occurrence in the Project Area
			Southern	Northern	
Big Bear Valley woollypod *Astragalus leucolobus*	CNPS List 1B.2	Lower montane coniferous forest, pebble plain, pinyon and juniper woodland, and upper montane coniferous forest in dry pine woods, gravelly knolls among sagebrush, or stony lake shores in the pine belt at elevations of 1670-2515 m.	Moderate	Moderate	Southern: Two historic occurrences are recorded in the general vicinity of Tehachapi. Project area supports limited habitat. Northern: Project area supports suitable habitat; however, this species has not been documented in the project area.
Breedlove's buckwheat *Eriogonum breedlovei* var. *breedlovei*	CNPS List 1B.2	Pinyon and juniper woodland, upper montane coniferous forest; carbonate soils; 1890-2590 m	Low	Moderate	Southern: Not known to occur in project area; however, project area supports suitable habitat. Northern: Has been documented in Piute Mountains north of project area (CNDDB, 2007). Suitable habitat extends into northern reaches of portion.
Calico monkeyflower *Mimulus pictus*	CNPS List 1B.2, BLM	Broadleaf upland forest, cismontane woodland; bare ground around gooseberry bush or granite rock outcrops; 100-1300 m	Low	Low	Southern: Historically known from Tejon Creek east of project area. Project area does not support suitable habitat. Northern: Has been historically documented in Tehachapi area (CNDDB, 2007); however, only limited suitable habitat has been identified in the project area.
California androsace *Androsace elongata* ssp. *acuta*	CNPS 4.2	Coastal scrub, chaparral, cismontane woodland, meadows and seeps, and valley and foothill grassland habitats. Elev. 492-3,936 ft. March-June.	Low	Low	Southern: Not known to occur in project area; however, desert bunchgrass grassland may provide suitable habitat. Northern: Not known to occur in the project area; however grasslands in project area may support suitable habitat.
California satintail *Imperata brevifolia*	CNPS 2.1	Meadows and seeps within chaparral, coastal scrub, and Mojavean desert scrub communities. Elev. below 1,700 ft. September-May.	Low	Low	Southern: Project area is above the elevational range for this species. Northern: Not known to occur in the project area and project area is above known elevation range.
Charlotte's phacelia *Phacelia nashiana*	CNPS List 1B.2, BLM, WMP	Joshua tree woodland, Mojavean desert scrub, pinyon and juniper woodland; granitic, sandy soils; 600-2200 m	Moderate	High	Southern: Not known to occur in project area; however, project area supports suitable habitat. Northern: There are several records in Jawbone Canyon just west of project area (CNDDB, 2007). Suitable habitat extends into project area.
Coulter's goldfields *Lasthenia glabrata* ssp. *coulteri*	CNPS List 1B.1, BLM	Marshes, swamps, playas, vernal pools; 1-1220 m	Low	Low	Southern: Historical accounts occur in Tehachapi area (CNDDB, 2007); however, suitable habitat does not occur in project area. Northern: Has been historically documented in Tehachapi area (CNDDB, 2007). However, suitable habitat has not been identified in the northern portion of the project area.
Creamy blazing star *Mentzelia tridentata*	CNPS List 1B.3	Mojavean desert scrub; rocky, gravelly, sandy substrates; 700-1160 m	Low	Low	Southern: Not known to occur in project area; however, suitable habitat occurs. Northern: Has not been documented in project area; however, suitable habitat occurs in project area. The project area is at the upper limits of the elevation range for this species.
Golden violet *Viola aurea*	CNPS List 2.2	Great Basin scrub and pinyon and juniper woodland habitat in sandy soils at elevations of 3,280 to 5,900 feet (1000 to 1800 m).	Moderate	Moderate	Southern: Indeterminate record at Mojave Station less than two miles from project area (CNDDB, 2007). Suitable habitat remains intact and extends into project area. Northern: Not known to occur in the project area; however, the project area supports suitable habitat.

Table 6.7-1. Special Status Plant Species with the Potential to Occur in the TWRA

Name	Status	Habitat Association and Elevation Limits	Potential to Occur		Known and Potential Occurrence in the Project Area
			Southern	Northern	
Greenhorn fritillary *Fritillaria brandegei*	CNPS List 1B.3	Lower montane coniferous forest; granitic soils; 1415-2100 m	Low	Moderate	Southern: Not known to occur in project area; project area does not support suitable habitat. Northern: Not known to occur in the project area; however, areas in the northern portion support suitable habitat.
Hoover's woollystar *Eriastrum hooveri*	CNPS List 4.2, BLM	Chenopod scrub, pinyon and juniper woodland, valley and foothill grassland; 50-915 m	Low	Low	Southern: Not known to occur in the project area and project area is above known elevation range. Northern: Not known to occur in the project area and elevations in the northern portion are above the known range for this species.
Horn's milk-vetch *Astragalus hornii var. hornii*	CNPS List 1B.1	Meadows and seeps, playas. Around lake margins on alkaline soils. Elevation 60-850 m.	Low	Low	Southern: One historical occurrence is recorded near Willow Springs less than five miles from project area (CNDDB, 20007). However, suitable habitat likely not present in project area. Northern: Not known to occur in the project area and suitable habitat has not been identified in the project area.
Kelso Creek monkeyflower *Mimulus shevockii*	CNPS List 1B.2, BLM, WMP	Joshua tree woodland, pinyon and juniper woodland; sandy or gravelly soils	Moderate	High	Southern: Not known to occur in project area; however, project area supports suitable habitat. Northern: This species is known to occur in the Kelso Creek area and suitable habitat occurs in the project area.
Kern buckwheat *Eriogonum kennedyi* var. *pinicola*	CNPS List 1B.1, BLM, WMP	Chaparral, pinyon and juniper woodland; open places on clay soils; 1400-1890 m	Moderate	Present	Southern: Not known to occur in project area; however, project area supports suitable habitat. Northern: Detected during surveys conducted in 2003 (EDAW, 2004). Has also been recorded along the west slope of Sweet Ridge at the southern end of the northern portion (CNDDB, 2007).
Lemmon's syntrichopappus *Syntrichopappus lemmonii*	CNPS List 4.3	Chaparral, Joshua tree woodland, and pinyon and juniper woodlands within sandy or gravelly soils. Elev. 1,640-6,004 ft. April-May.	High	High	Southern: There are several occurrences of this species in the Antelope Valley and surrounding mountains, and suitable habitat is present within the study area. Northern: This species is known to occur in the general project region and suitable habitat occurs in the project area.
Mojave Indian paintbrush *Castilleja plagiotoma*	CNPS List 4.3	Great Basin scrub, Joshua tree woodland, lower montane coniferous forest, and pinyon and juniper woodland habitats. Elev. 984-8,200 ft. April-June.	High	High	Southern: Suitable habitat for this species is present, and there are numerous collections from the Antelope Valley. Northern: Known to occur in areas south of project area and suitable habitat occurs in project area.
Mojave tarplant *Deinandra mohavensis*	SE, CNPS List 1B.3, WMP	Chaparral, coastal scrub, riparian scrub; mesic soils; 640-1600 m	Moderate	High	Southern: Not known to occur in project area; however, project area supports suitable habitat. Northern: Has been documented in Jawbone Canyon less than five miles east of project area (CNDDB, 2007). Suitable habitat extends into project area.
Pale-yellow layia *Layia heterotricha*	CNPS List 1B.1, BLM	Cismontane woodland, pinyon-juniper woodland, valley and foothill grassland. Alkaline or clay soils, open areas at elevations of 270-1365 m.	Moderate	High	Southern: This species is known from historical occurrences near Tehachapi. Project area supports suitable habitat. Northern: This species has been documented between Sand Canyon and Horse Canyon adjacent to the western edge of the northern portion (CNDDB, 2007). Suitable habitat occurs throughout the region.

Table 6.7-1. Special Status Plant Species with the Potential to Occur in the TWRA

Name	Status	Habitat Association and Elevation Limits	Potential to Occur		Known and Potential Occurrence in the Project Area
			Southern	Northern	
Palmer's mariposa lily *Calochortus palmeri* var. *palmeri*	CNPS List 1B.2	Moist, but not saturated, montane meadows.	Moderate	Present	Southern: Not known to occur in project area; however, project area may support suitable habitat. Northern: Has been documented in Horse Canyon at the southern edge of the northern portion (CNDDB, 2007). The area is highly undeveloped and it is assumed that suitable habitat remains intact in the area.
Parry's spineflower *Chorizanthe parryi* var. *parryi*	CNPS List 3.2	Sandy or rocky openings within chaparral and coastal scrub communities. Elev. 120-6,000 ft. April-June.	Low	Low	Southern: There are no records of this variety north of the San Gabriel Mountains. A historic population in the vicinity of Lancaster was likely misidentified. Northern: Not known to occur in the project area and suitable habitat has not been identified in the project area.
Pierson's morning glory *Calystegia peirsonii*	CNPS List 4.2	Chaparral, chenopod scrub, cismontane woodland, coastal scrub, lower montane coniferous forest, and valley and foothill grasslands at elevations of 30-1500 meters.	Moderate	Low	Southern: Marginal habitat occurs within the project area. There are several reported occurrences in the Antelope Valley. Northern: Not known to occur in the project area; however, the project area supports suitable habitat.
Piute cypress *Cupressus arizonica* ssp. *nevadensis*	CNPS List 1B.2, BLM	Closed-cone coniferous forest, chaparral, cismontane woodland, pinyon-juniper woodland; dry slopes; 715-1575 m	Moderate	High	Southern: Not known to occur in project area; however, project area supports suitable habitat. Northern: Has been documented in Back Canyon on western edge of project area (CNDDB, 2007). Record is over twenty years old; however, contiguous habitat remains in the region and suitable habitat occurs along northern slopes in the area.
Piute Mountains jewel-flower *Streptanthus cordatus* var. *piutensis*	CNPS List 1B.2, BLM, WMP	Broadleaved Upland Forest, Closed-cone Coniferous forest, and Pinyon and Juniper Woodland habitats in clay or metamorphic soils. Elev. 3,593-5,692 ft. May-July.	Low	High	Southern: This variety is known only from the southern Sierra Nevada and Tehachapi Mountains. No suitable habitat is present. Northern: Historic records indicate occurrences on and adjacent to Cache Peak in the northern portion (CNDDB, 2007). Suitable habitat occurs within vegetation communities at higher elevations in the project area.
Piute Mountains navarretia *Navarretia setiloba*	CNPS List 1B.1, BLM	Cismontane woodland, pinyon and juniper woodland, and valley and foothill grassland habitats in clay or gravelly loam soils. Elev. 1,000-6,890 ft. May-June.	Low	Moderate	Southern: Historical account at Grapevine Peak on Tejon Ranch west of project area (CNDDB, 2007). Although project area may support suitable habitat, this species is not known to occur south of the Tehachapi Mountains. Northern: Known distribution is restricted to Piute Mountains. Suitable habitat occurs in the project area.
Pygmy poppy *Canbya candida*	CNPS List 4.2, BLM	Joshua tree woodland, Mojavean desert scrub, or pinyon and juniper woodland habitats with gravelly, granitic, or sandy soils. Elev. 1,968-4,790 ft. March-June.	Moderate	Moderate	Southern: Suitable habitat for this species is present, and there are several records in the vicinity of Edwards Air Force Base. Northern: Not known to occur in the project area; however, project area supports suitable habitat.
Red Rock poppy *Eschscholzia minutiflora* ssp. *twisselmannii*	CNPS List 1B.2, BLM, WMP	Mojavean desert scrub; volcanic tuff; 680-1230 m	Moderate	High	Southern: Has been documented in vicinity of Edwards Air Force Base east of project area (CNDDB, 2007). Suitable habitat occurs in the project area. Northern: Known to occur in Water Canyon approximately five miles east of project area. Project area supports suitable habitat.

Table 6.7-1. Special Status Plant Species with the Potential to Occur in the TWRA

Name	Status	Habitat Association and Elevation Limits	Potential to Occur		Known and Potential Occurrence in the Project Area
			Southern	Northern	
Red Rock tarplant *Deinandra arida*	SR, CNPS List 1B.2, WMP	Mojavean desert scrub; clay or volcanic tuff; 300-950 m	Moderate	Low	Southern: Not known to occur in project area; however, project area supports suitable habitat. Northern: Known from Last Chance Canyon just north of project area. Project area is above the known elevation range.
Reveal's buckwheat *Eriogonum contiguum*	CNPS List 2.3	Mojavean desert scrub; sandy soils; 30-1320 m	Moderate	High	Southern: Not known to occur in project area; however, project area supports suitable habitat. Northern: Has been reported in area of Jawbone Canyon; however, subsequent surveys did not detect this species (EDAW, 2004).
Round-leaved filaree *California macrophylla*	CNPS List 1B.1	Cismontane woodland, valley and foothill grassland in clay soils at elevations of 15-1200 m.	Moderate	Low	Southern: Has been recorded on Tejon Ranch less than ten miles west of project area (CNDDB, 2007). Suitable grassland habitat extends into project area. Northern: Has been historically documented in the area of Tehachapi (CNNDDB, 2007). Project area is at upper limits of known elevation range.
Sagebrush loeflingia *Loeflingia squarrosa var. artemisiarum*	CNPS List 2.2, BLM, WMP	Great basin scrub, Sonoran Desert scrub, and desert dunes in sandy areas around clay slicks at elevations of 700-1200 m.	High	Low	Southern: Known to occur just east of Highway 14 less than five miles from project area (CNDDB, 2007). Occurrence is at upper limits of elevation range and project area increases in elevation towards west. Northern: Not known to occur in the project area and suitable habitat has not been identified in the project area.
Salt spring checkerbloom *Sidalcea neomexicana*	CNPS List 2.2	Chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub, and playa habitats in alkaline and mesic soils. Elev. 49-5,020 ft. March-June.	Low	Moderate	Southern: There are no recorded occurrences of the species in the Antelope Valley. Project area supports limited habitat. Northern: Not known to occur in project area; however, project area supports suitable habitat.
Short-joint beavertail *Opuntia basilaris* var. *brachyclada*	CNPS List 1B.2, BLM, WMP	Open chaparral, juniper woodland, or similar woodland communities, but not at high elevations.	Low	Low	Southern: This variety is known only from the northern desert slopes of the San Gabriel and San Bernardino Mountains. Northern: Not known to occur in project area. Project area is above known elevation range for this species.
Slender mariposa lily *Calochortus clavatus* var. *gracilis*	CNPS List 1B.2	Coastal sage scrub or mixed scrub habitat limited to the Transverse Ranges of California.	Low	Low	Southern: The project area lies outside the known range of this variety, which is endemic to the Transverse Range. Northern: Not known to occur in the project area. Project area is outside the known range.
Spanish needle onion *Allium shevockii*	CNPS List 1B.3, BLM, WMP	Pinyon-juniper woodland, upper montane coniferous forest; soil pockets on rock outcrops and talus slopes; 2000-2300 m	High	Present	Southern: Known to occur in general project region. Project area supports suitable habitat. Northern: Several records exist for this species in the project area, particularly Horse Canyon at the southern border of the northern portion (CNDDB, 2007). It is also known to occur along the WMPA boundary (BLM, 2005a).
Spjut's bristle-moss *Orthotrichum spjutii*	CNPS List 1B.3	Lower montane coniferous forest, pinyon-juniper woodland, subalpine coniferous forest, upper montane coniferous forest; grows on granitic rock; 2100-2400 m	Low	High	Southern: Not known to occur in project area; project area supports limited habitat. Northern: There are indeterminate records for the occurrence of this species in Horse Canyon, just west of the project area (CNDDB, 2007). Suitable habitat occurs in several vegetation communities that are present in the project area.

Table 6.7-1. Special Status Plant Species with the Potential to Occur in the TWRA					
Name	Status	Habitat Association and Elevation Limits	Potential to Occur		Known and Potential Occurrence in the Project Area
			Southern	Northern	
White-bracted spineflower *Chorizanthe xanti* var. *leucotheca*	CNPS List 1B.2	Mojavean desert scrub and pinyon and juniper woodland habitats at elevations of 300-1200 meters.	Low	Low	Southern: Although suitable habitat is present, there are no reports of this variety occurring north of the Transverse Range. Northern: Not known to occur in the project area. The project area supports suitable habitat; however project area is outside the known distribution of this variety.

Wildlife

Special-status wildlife species include those listed as threatened or endangered under the federal or California Endangered Species Acts, species proposed for listing, species of special concern, and other species which have been identified by the USFWS, CDFG, or local jurisdictions as unique or rare and which have the potential to occur within the study area. Each of the species in Table 6.7-2 was assessed for its potential to occur within the project areas based on the criteria discussed above.

Table 6.7-2. Special Status Wildlife Species with the Potential to Occur in the TWRA					
Name	Status	Habitat Association	Potential to Occur		Known and Potential Occurrence in the Project Area
			Southern	Northern	
AMPHIBIANS					
Arroyo toad *Bufo californicus*	FE, CSC	Prefers sandy arroyos and drainage bottoms in 3rd- to greater-order streams with open riparian vegetation in inland valleys and foothills; also may use flooded agricultural fields and irrigation ditches.	Low	Low	Southern: Has not been documented in the project area and no suitable habitat occurs. Northern: No suitable habitat has been identified in the project area and this species has not been documented in the northern portion of the project area.
California red-legged frog *Rana aurora draytoni*	FT, CSC	Inhabits permanent and semi-permanent aquatic habitats, such as creeks and cold-water ponds, with emergent and submergent vegetation. May estivate in rodent burrows or cracks during dry periods.	Low	Low	Southern: Suitable habitat not present in project study area. Northern: No suitable habitat has been identified in the project area and this subspecies has not been documented in the northern portion of the project area.
Tehachapi slender salamander *Batrachoseps stebbinsi*	ST, BLM	Inhabits moist canyons and ravines in oak and mixed woodlands. Found under rocks, logs, bark, leaf-litter and other debris in moist areas, often near talus slopes.	High	Moderate	Southern: The oak or mixed pine-oak woodland habitats types required by Tehachapi slender salamanders are present adjacent to the northwestern portion of the project area, where the known range of the species approaches the project area. Northern: This species is known to occur along Caliente Creek, west of the project area (CNDDB, 2007). Suitable habitat may occur within canyons and ravines in project area.
Yellow-blotched salamander *Ensatina eschscholtzii croceator*	CSC, BLM	Oak, pine, fir, and mixed woodlands; also in canyons in leaf litter and debris from canyon live oaks.	Present	Moderate	Southern: Known to occur in Antelope Canyon at northwestern edge of portion (CNDDB, 2007). Northern: Although only limited habitat has been identified in the project area and no known records occur for this subspecies in the northern portion of the project area, it is known to occur in Big Last Chance Canyon in similar habitat types west of the project area (CNDDB, 2007).

Table 6.7-2. Special Status Wildlife Species with the Potential to Occur in the TWRA

Name	Status	Habitat Association	Potential to Occur		Known and Potential Occurrence in the Project Area
			Southern	Northern	
REPTILES					
California horned lizard *Phrynosoma coronatum frontale*	CSC, BLM	Loose sandy loam and alkaline soils in habitats including chaparral, grasslands, saltbush scrub, coastal scrub, and clearings in riparian woodlands.	Moderate	Moderate	Southern: May occur across a variety of undeveloped habitats within the project area. Northern: Has not been documented in the project area; however, suitable habitat occurs in the project area.
Desert tortoise *Gopherus agassizii*	FT, ST, WMP	Inhabits semi-arid grasslands, gravelly desert washes, canyon bottoms and rocky hillsides.	Present	Present	Southern: Known to occur at several locations just west of project area. Suitable habitat exists within the creosote scrub and Joshua tree woodland habitats in the eastern portions of the project area and it is assumed that this species is present. Northern: Detected during surveys conducted in 2002 at the mouth of Pine Tree Canyon and adjacent to Pine Tree Canyon Road (EDAW, 2004). Suitable habitat occurs throughout the southeastern boundary of the northern portion.
Northern sagebrush lizard *Sceloporus graciosus graciosus*	BLM	Prefers sagebrush, manzanita and ceanothus brushland, pinyon-juniper woodland, pine and fir forests, and river bottoms. Requires good light, open ground, and scattered low bushes.	Low	Low	Southern: Although suitable habitat occurs, project area is outside the known range for this subspecies. Northern: Only limited suitable habitat has been identified in the project area and the project area is outside the known range.
San Diego horned lizard *Phrynosoma coronatum blainvillei*	CSC, WMP	Loose sandy loam and alkaline soils in habitats including chaparral, grasslands, saltbush scrub, coastal scrub, and clearings in riparian woodlands.	Low	Low	Southern: Has been historically documented in Fairmont vicinity less than ten miles south of project area; however, project area likely lies outside of current range. Northern: This subspecies is known to occur much further south. Only limited suitable habitat has been identified in the project area.
Silvery legless lizard *Anniella pulchra pulchra*	CSC	Sandy or loose loamy soils covered by sparse vegetation.	High	High	Southern: May occur across a variety of undeveloped habitats within the Project area. Northern: Although this wide-ranging subspecies has not been identified in the project area, it is known to occur in a variety of vegetation communities and the project area lies within the known range.
Southwestern pond turtle *Emys (Clemmys) marmorata pallida*	CSC, BLM, WMP	In and around a wide variety of permanent or nearly permanent aquatic habitats.	Low	Low	Southern: Suitable habitat may be present in the Oak Creek system. Northern: There are no known records in the project area and suitable habitat has not been identified in the project area.
Two-striped garter snake *Thamnophis hammondii*	CSC, BLM	In or near permanent freshwater, more commonly in pools of streams with a rocky substrate, bordered by riparian vegetation.	Low	Low	Southern: Has not been identified in the project area; however, suitable habitat may occur in the Oak Creek system. Northern: There are no known records in the northern portion and suitable habitat has not been identified in the project area.
BIRDS					
American white pelican *Pelecanus erythrorhynchos*	CSC, WMP	Sandy coastal beaches and lagoons, waterfronts and pilings, rocky cliffs.	Present	Moderate	Southern: Observed migrating through the project region in large numbers (Kern County, 2007). Northern: There are no known records for this species in the northern portion and suitable habitat has not been identified in the project area. May occur as a migrant in the northern portion.

Table 6.7-2. Special Status Wildlife Species with the Potential to Occur in the TWRA

Name	Status	Habitat Association	Potential to Occur		Known and Potential Occurrence in the Project Area
			Southern	Northern	
Bald eagle *Haliaeetus leucocephalus*	FT, SE, FP, SP	Coniferous woodland or forest areas near water. Rocky cliffs.	Not likely to occur	Not likely to occur	Southern: Has not been documented in the project area and suitable habitat does not occur. Northern: There are no known records for this species in the northern portion and the project area lacks large water bodies that provide suitable habitat.
Bendire's thrasher *Toxostoma bendirei*	CSC, BLM, WMP	Nests in complex desert scrub habitats and Joshua tree woodland.	Moderate	Moderate	Southern: Suspected to occasionally occur in potential nesting habitat within the project area, but there are no documented records. Northern: There are no known records for this species in the northern portion; however, the region supports suitable nesting habitat.
California condor *Gymnogyps californianus*	FE, SE, SP	Requires vast expanses of open savannahs, grasslands, and foothill chaparral in mountain ranges of moderate altitude. Nests in clefts of rocky walls of deep canyons. Can forage up to 100 miles (161 km) from roost/nest.	Present	High	Southern: Nesting habitat absent. Foraging habitat is present. Critical Habitat occurs adjacent to the southwest portion of the TWRA, and a condor preserve is located on Tejon Ranch to the west of the study area. This area is within the historic range of the condor, and as the reintroduced population grows, they will likely utilize this area again (Grantham, 2008). Northern: Nesting habitat absent. Foraging habitat is present. This area is within the historic range of the condor, and as the reintroduced population grows, they will likely utilize this area again (Grantham, 2008).
California gray-headed junco *Junco hyemalis caniceps*	CSC	Typically found in montane coniferous forests.	Not likely to occur	Low	Southern: Has not been documented in the project area and the project area does not support suitable habitat. Northern: Although suitable habitat occurs, particularly in the northwest corner of the northern portion, the project area is west of the known range for this subspecies.
California gull *Larus californicus*	CSC, WMP	Breeds on islands in lakes and open marshes. Forages in a variety of habitats including marshes, nearshore Pacific Ocean, lakes, agricultural fields, landfills, rivers, grasslands and parks.	Low	Low	Southern: Not known to breed in the Antelope Valley, but non-breeding gulls may forage in the project area. Northern: May occur in the Antelope Valley as a winter migrant (BLM, 2005a); however, suitable habitat has not been identified in the project area.
California horned lark *Eremophila alpestris actia*	CSC	Occurs on barren ground, in plowed fields, overgrazed pasture, tundra, and shores.	High	Moderate	Southern: Known to occur in the vicinity of Mojave just east of project area (CNDDB, 2007). Suitable habitat occurs throughout the project area. Northern: Not documented in northern portion; however, suitable habitat may occur within grassland valleys and pastures throughout the project area.
Cooper's hawk *Accipiter cooperii*	CSC, WMP	Mature forests, open woodlands, riparian forests, and parks.	High	Present	Southern: Known to occur in the project region and project area supports suitable habitat. Northern: This species was detected during surveys conducted in 2004 (EDAW, 2004).
Ferruginous hawk *Buteo regalis*	CSC, BLM, WMP	Forages in grasslands and agricultural fields.	High	Moderate	Southern: Known to occur in the Antelope Valley during winter. Northern: May occur as a winter migrant. The project area is highly undeveloped and supports limited grasslands and agricultural fields that may provide foraging habitat for this species.
Golden eagle *Aquila chrysaetos*	SP, CSC, BLM	Forages in open grasslands, desert scrub and agricultural fields. Nests on ledges on cliff faces, rock outcrops and occasionally in large trees.	High	Present	Southern: There are many winter records from the Antelope Valley; however, there are few summer records. Observed during surveys for a different project in the vicinity in 2007. Northern: This species was detected during surveys conducted in 2002 and 2003. It is also known to nest in the general project region.

Table 6.7-2. Special Status Wildlife Species with the Potential to Occur in the TWRA

Name	Status	Habitat Association	Potential to Occur		Known and Potential Occurrence in the Project Area
			Southern	Northern	
Least Bell's vireo *Vireo bellii pusillus*	FE, SE, WMP	Dense riparian scrub including willows and mulefat.	Low	Low	Southern: There is potentially suitable habitat along Oak Creek in the project vicinity. Northern: Has not been documented in the project area and suitable riparian habitat has not been identified in the project area.
LeConte's thrasher *Toxostoma lecontei*	CSC, BLM, WMP	Occurs in desert scrub habitats, open washes, and Joshua tree woodland.	Present	Present	Southern: This species has been documented at several locations along the eastern border of the project area. Northern: San Joaquin subspecies (*T. l. macmillanorum*) was detected during surveys conducted in 2004 (EDAW, 2004)
Long-billed curlew *Numenius americanus*	CSC, WMP	Winters and migrates in short grasslands and agricultural fields. Breeds in short-grass prairies and meadows outside of southern California.	Low	Low	Southern: Suitable habitat does not occur in project area. Northern: Known to occur near Lancaster Lake at Edwards Air Force Base, southeast of the project area (BLM, 2005a). Suitable habitat has not been identified in the project area.
Long-eared owl *Asio otus*	CSC, WMP	Breeds in thickly vegetated desert washes and oases, montane coniferous forests and in riparian and pinyon-juniper woodlands.	High	High	Southern: Suitable nesting habitat occurs at several locations throughout project study area. Has been observed roosting in vicinity. Northern: Has been documented near Bishop Springs less than ten miles east of project area. Suitable habitat extends into project area.
Loggerhead shrike *Lanius ludovicianus*	CSC, WMP	Nests in isolated tall shrubs and dense trees (including Joshua trees) in open landscapes. Forages in desert scrub, agricultural fields, grasslands, and Joshua tree woodlands.	Present	Present	Southern: Many were found scattered throughout grassland, alkali sink, open scrub, and agricultural fields during reconnaissance-level surveys for a project in the region in June 2006 (Aspen, 2006). Suitable habitat is abundant. Northern: This species was detected along Jawbone Canyon during surveys conducted in 2003.
Merlin *Falco columbarius*	CSC	Forages in most habitats, especially near concentrations of small birds that they prey upon, including shorebirds.	High	High	Southern: Likely present during the winter or migration periods. Northern: There are no known records; however, suitable foraging habitat occurs throughout the northern portion.
Mountain plover *Charadrius montanus*	CSC, WMP	Winters in short grasslands and agricultural fields. Breeds in short-grass prairies outside of California.	High	Moderate	Southern: Has been documented in near Antelope Acres less than ten miles south of project area. Wintering flocks annually occur in agricultural fields in the Antelope Valley. Project area supports suitable habitat. Northern: May occur within grasslands throughout the northern portion.
Northern harrier *Circus cyaneus*	CSC, WMP	Breeds and forages in emergent wetlands and nearby open grasslands, and fallow fields. Also forages in agricultural fields and desert scrub.	High	Present	Southern: Not suspected to breed in the project area. Foraging birds may occur in open habitats. Northern: This species was detected during surveys conducted in 2002.
Peregrine falcon *Falco peregrinus*	SE, SP	Nests on cliff ledges and forages where there are large concentrations of birds, especially waterfowl and shorebirds.	Low	Moderate	Southern: A few migrate through the Antelope Valley, but are more likely to occur at freshwater marshes and sewage ponds. Northern: Suitable nesting habitat occurs along the Sierra Nevada foothills. May utilize various habitats in the northern portion for foraging.
Prairie falcon *Falco mexicanus*	CSC	Forages in desert scrub, grasslands, agricultural fields and Joshua tree woodland. Nests on cliffs or escarpments, usually overlooking dry, open terrain or uplands.	Present	High	Southern: Have been observed foraging in project area during surveys in the region. Northern: Has been documented at several sensitive locations adjacent to project area (CNDDB, 2007). Suitable nesting habitat occurs along foothills throughout the project area.

Table 6.7-2. Special Status Wildlife Species with the Potential to Occur in the TWRA

Name	Status	Habitat Association	Potential to Occur		Known and Potential Occurrence in the Project Area
			Southern	Northern	
Sharp-shinned hawk *Accipiter stiatus*	CSC, WMP	Visitor to woodlands, parks, and residential areas.	Moderate	Moderate	Southern: Has not been documented in project area; however, suitable habitat occurs throughout developed areas of the project region. Northern: May occur as a winter migrant and suitable habitat occurs at higher elevations
Short-eared owl *Asio flammeus*	CSC, WMP	Breeds in marshes or in nearby moist grasslands or fallow fields. Forages in the same habitats but may also forage in agricultural fields and dry grasslands.	Low	Low	Southern: May forage in project area, but no breeding habitat present. Northern: Known to occur near Edwards Air Force Base (BLM, 2005a). The project area supports limited foraging habitat.
Southwestern willow flycatcher *Empidonax traillii extimus*	FE, WMP	Breeds in densely vegetated riparian associations of cottonwoods and willows.	Low	Low	Southern: There is potentially suitable breeding habitat along Oak Creek in the project vicinity. Northern: Has not been documented in the project area and suitable riparian habitat has not been identified in the project area.
Summer tanager *Piranga rubra*	CSC, WMP	Breeds in mature, desert riparian habitats dominated by cottonwood and willow.	Moderate	Moderate	Southern: There is suitable breeding habitat along Oak Creek. Northern: There are no known records for this species in the northern portion; however, suitable breeding habitat may occur along portions of Jawbone Canyon and desert riparian washes in the project area.
Swainson's hawk *Buteo swainsoni*	ST, WMP	Nests in trees near foraging areas that include grasslands and agricultural croplands, especially alfalfa.	High	Low	Southern: Located in the vicinity of Rosamond in developed area less than ten miles southeast of project area (CNDDB, 2007). Suitable habitat occurs in project area. Northern: There are no known records in the northern portion and only limited habitat has been identified in the project area.
Tricolored blackbird *Agelaius tricolor*	CSC, BLM, WMP	Nests in freshwater emergent wetlands, nettle, thistle, willow riparian thickets, and in crops such as alfalfa and safflower.	Moderate	Low	Southern: Nesting colonies in the Antelope Valley are in freshwater marshes. Has been documented at Tehachapi sewer ponds less than five miles northwest of project area. Limited habitat occurs in project area. Northern: There are no known records in the northern portion. Suitable habitat has not been identified in the project area.
Vaux's swift *Chaetura vauxi*	CSC, WMP	Feeds aerially on small insects, breeds in forest habitats.	High	High	Southern: Observed during directed songbird surveys for the PdV Wind Energy Project (Kern County, 2007), located west of the proposed project. Northern: Likely occurs throughout the project area during spring and fall migration periods (BLM, 2005a).
Vermillion flycatcher *Pyrocephalus rubinus*	CSC, WMP	Nests in desert riparian and landscaped cottonwoods and other trees in developed areas including golf courses; often near agricultural or grassland areas.	Low	Low	Southern: There is potential nesting habitat in the trees along roads and near houses on the Antelope Valley floor, especially in the vicinity of alfalfa fields. The riparian trees along Oak Creek also provide potential nesting habitat. Northern: Suitable nesting habitat occurs in several areas of the northern portion; however, the project area is outside of the known range.
Western burrowing owl *Athene cunicularia*	CSC, BLM, WMP	Found in open, dry grasslands, agricultural and range lands, and desert habitats often associated with burrowing animals, such as ground squirrels.	Present	High	Southern: Project area contains suitable foraging habitat and California ground squirrel burrows that could provide breeding habitat. Has been observed and recorded nesting in project area. Northern: Known to occur in general project region and suitable habitat occurs along southern reaches of the northern portion.

Table 6.7-2. Special Status Wildlife Species with the Potential to Occur in the TWRA

Name	Status	Habitat Association	Potential to Occur		Known and Potential Occurrence in the Project Area
			Southern	Northern	
White-tailed kite *Elanus leucurus*	SP	Forages in open grasslands, desert scrub and agricultural fields. Nests on trees and large shrubs.	Moderate	Moderate	Southern: Rare and local breeder in Antelope Valley, with no confirmed breeding in the project area. More common during the winter, and likely to forage in the project area. Northern: No known records in northern portion; however, suitable foraging habitat occurs throughout desert areas in project region.
Yellow-billed cuckoo *Coccyzus americanus*	FC, SE, WMP	Breeds in densely vegetated riparian associations of cottonwoods and willows.	Low	Low	Southern: There is potentially suitable breeding habitat along Oak Creek in the project vicinity. Northern: Has not been documented in the project area and suitable riparian habitat has not been identified in the project area.
Yellow-breasted chat *Icteria virens*	CSC, WMP	An uncommon and localized summer resident. The breeding population is confined to riparian woodlands. Can be found up to 6,561 feet in elevation in desert riparian habitats.	Low	Low	Southern: There is potentially suitable breeding habitat along Oak Creek in the project vicinity. Northern: There are no known records in the northern portion and only limited suitable habitat has been identified in the project area.
MAMMALS					
American badger *Taxidea taxus*	CSC	Found in a variety of grassland habitats, usually in association with burrowing mammals, their primary prey.	High	High	Southern: Suitable habitat on the Valley floor in non-native grassland and desert scrub habitats. May occur in the vicinity of ground squirrel colonies. Numerous occurrences recorded in region. Northern: Has been documented in the Kelso Basin less than one mile north of the project area (CNDDB, 2007). This record is over thirty years old; however, the area is highly undeveloped and suitable habitat remains intact.
Big free-tailed bat *Nyctinomops macrotis*	CSC	Roosts primarily in cliff and rocky areas, buildings and occurs in desert scrub and arid forests.	Low	Low	Southern: May rarely migrate through the project area. Northern: May occur as a migrant in the northern portion. The project area is outside of the known range.
California bighorn sheep *Ovis canadensis californiana*	FE, SE, WMP	Typically occurs in steep-walled canyons and ridges bisected by rocky or sandy washes with available water.	Not likely to occur	Low	Southern: The southern portion does not support suitable habitat. Northern: This subspecies is mostly uncommon in California and is known from two native herds in the southern Sierra Nevada. Only limited suitable habitat has been identified in the project area.
Fringed myotis *Myotis thysanodes*	BLM	Occurs in oak, pinyon pine, and juniper woodlands above 5,000 feet.	Low	Moderate	Southern: Has not been documented in the project area and project area is below preferred elevations for this species. Northern: Although there are no known records in the northern portion, the project area supports suitable habitat for this species at higher elevations.
Long-eared myotis *Myotis evotis*	BLM	Found predominantly in coniferous forests at elevations of between 7,000 and 8,500 feet. Also found in sage habitats.	Low	Low	Southern: Has not been documented in the project area and project area is below preferred elevations for this species. Northern: There are no known records and the project area is below the known elevation preference. Limited habitat occurs in the project region.
Long-legged myotis *Myotis volans*	WMP	Occurs in oak, pinyon pine, and juniper woodlands above 4,000 feet.	Moderate	High	Southern: Not known to occur in the project area; however, the project area support suitable habitat towards the north. Northern: Has been documented at Simon Mine less than five miles north of project area (CNDDB, 2007). Suitable habitat extends into northern portion.

Table 6.7-2. Special Status Wildlife Species with the Potential to Occur in the TWRA

Name	Status	Habitat Association	Potential to Occur		Known and Potential Occurrence in the Project Area
			Southern	Northern	
Mohave ground squirrel *Spermophilus mohavensis*	ST, WMP	Desert scrub habitats, usually on flat to gently sloping terrain with alluvial soils.	Present	High	Southern: Detected in project area during surveys conducted in 2006 (Aspen, 2006). Suitable habitat in Joshua tree woodland and creosote scrubland south of Oak Creek Drive. Northern: Has been documented near Mayan Peak less than ten miles from project area (CNDDB, 2007). Project area lies within known distribution and suitable habitat occurs.
Pacific fisher *Martes pennanti pacifica*	FC, CSC, BLM	Habitat requirements are generally undisturbed late-successional forest.	Low	Moderate	Southern: Not known to occur in the project area and the project area does not support suitable habitat. Northern: Known to occur in area of Weldon Meadows less than ten miles north of project area (CNDDB, 2007). Suitable habitat occurs along northern edge of portion.
Pale big-eared bat *Corynorhinus townsendii pallescens*	CSC, BLM	Occurs in a variety of habitats from desert shrub to pinyon-juniper and coniferous forests at a wide range of elevations.	Moderate	Moderate	Southern: No known records in the project area; however, project area supports suitable habitat in a variety of vegetation communities. Northern: The project area is within the known distribution and supports suitable habitat throughout the northern portion.
Pallid bat *Antrozous pallidus*	CSC, BLM	Typically roost in rocks, caves, trees snags, bridges, and buildings. Occurs in grassland, shrubland, woodlands, and coniferous forests near water.	High	Moderate	Southern: Marginal roosting habitat occurs within the project area, and this species may forage over portions of the project study area. Northern: This species has been historically documented in Kelso Canyon, north of the project area. Suitable habitat remains intact as the area is highly undeveloped.
Ringtail *Basariscus astutas*	SP	Occurs primarily in riparian habitats, but also known from most forest and shrub habitats from lower to mid elevations.	Moderate	Moderate	Southern: Suitable habitat exists along Oak Creek in the project vicinity. Northern: No known records exist in the northern portion; however, suitable habitat occurs in the project area.
San Joaquin pocket mouse *Perognathus inornatus*	BLM	Lives in arid annual grasslands and desert scrub on fine or sandy soils.	Low	Low	Southern: Suitable habitat occurs in project area; however, project area is east of known range. Northern: Although suitable habitat occurs, project area is east of known range for this species.
Small-footed myotis *Myotis ciliolabrum*	BLM	Found in desert and semi-desert mountainous areas and shortgrass prairie regions.	Moderate	Moderate	Southern: Not known to occur in project area; however, suitable habitat occurs throughout the mountainous northern boundary. Northern: Has not been documented in the project area; however, project area is within known range and suitable habitat occurs.
Southern grasshopper mouse *Onychomys torridus ramona*	CSC	Occurs in alkali desert scrub, and also succulent shrub, wash, and riparian communities. Subspecies also can occur in grassland and chaparral habitats.	Moderate	Low	Southern: This subspecies is distributed in the coastal and mountainous areas of southwestern California. Suitable habitat occurs in the project area. Northern: Project area is within known range; however, only limited habitat has been identified in project area.
Spotted bat *Euderma maculatum*	CSC, BLM	Roost sites are cracks, crevices, and caves, and primarily in fractured rock cliffs. Occurs in desert-scrub, pinyon-juniper woodland, ponderosa pine, mixed conifer forest, canyon bottoms, rims of cliffs, riparian areas, fields, and open pasture.	Low	Moderate	Southern: Roosting habitat not likely to be present. Foraging habitat occurs throughout the project area. Northern: Project is within known range and suitable habitat occurs throughout northern portion.

Table 6.7-2. Special Status Wildlife Species with the Potential to Occur in the TWRA

Name	Status	Habitat Association	Potential to Occur		Known and Potential Occurrence in the Project Area
			Southern	Northern	
Tehachapi pocket mouse *Perognathus alticolus inexpectatus*	CSC, WMP	Habitat not well defined but occurs in a diversity of habitats including, Joshua tree woodland, pinyon-juniper woodland, oak savanna, and native and non-native grasslands. Burrows in friable, sandy soil.	High	Moderate	Southern: Has been historically documented at several locations in Tehachapi Valley and is known to occur at Bronco Canyon less than five miles west of project area (CNDDB, 2007). There is suitable habitat throughout the project area. Northern: May occur along southern edge of northern portion as this area is at the limits of the known distribution for this subspecies.
Townsend's big-eared bat *Corynorhinus townsendii*	CSC, BLM	Typically roost in buildings, bridges, rock crevices, and hollow trees, but primarily in abandoned mines. Occurs in coniferous forests, mixed forests, deserts, native prairies, riparian communities, active agricultural areas, and coastal habitat types.	Present	High	Southern: Known to occur on private lands in vicinity of Soledad Mountain just west of Interstate 14 within project area (CNDDB, 2007). Suitable habitat occurs throughout project area. Northern: Has been documented at Four Oaks Mine less than five miles northwest of project area. Suitable habitat occurs in the project area.
Tulare grasshopper mouse *Onychomys torridus tularensis*	CSC, BLM	Occurs in alkali desert scrub, and also succulent shrub, wash, and riparian communities. Subspecies also can occur in grassland and chaparral habitats.	High	Moderate	Southern: Has been historically documented in project area just south of Highway 58 (CNDDB, 2007); however, no known recent records exist. The project area supports suitable habitat. Northern: Has been historically documented in Kelso Canyon less than ten miles north of project area. Suitable habitat remains intact and extends into the project area.
Western mastiff bat *Eumops perotis*	CSC, BLM	Typically roost in crevices in large boulders and buildings, but primarily roosts in cliffs. Occurs in broad open areas and forages in dry desert washes, flood plains, chaparral, oak woodland, open ponderosa pine forest, grassland, and agricultural areas.	High	Moderate	Southern: Roosting habitat occurs in the western portion of the project area and in the valley where buildings occur. Northern: Northern portion is highly undeveloped and limits roosting potential for this species. Suitable foraging habitat occurs throughout northern portion.
Yellow-eared pocket mouse *Perognathus parvus xanthonotus*	BLM, WMP	Typically found in sandy soils with sparse vegetation. Known from grasslands, desert scrub, Joshua tree woodland, pinyon, and juniper woodland.	Low	Moderate	Southern: Southern portion is south of known existing populations. Northern: Historically known from four locations within canyons of Tehachapi Mountains. Suitable habitat extends into northern edge of portion.
Yuma myotis *Myotis yumanensis*	BLM	Wide range of habitats includes desert scrub, coniferous forests, and chaparral. Must have a water source.	Moderate	Moderate	Southern: Has not been documented in project area; however, project areas supports suitable habitat. Northern: No known records exist in northern portion; however, suitable habitat occurs throughout the region, particularly in northern areas where permanent water sources are likely to occur.

6.7.2 Applicable Laws, Regulations, and Standards

The majority of the laws, regulations, and standards related to Biological Resources that would be applicable to the proposed Tehachapi Renewable Transmission Project (TRTP), as described in Section 3 of the Biological Specialist Report, would also be applicable to future development of the TWRA (including the proposed Alta Wind Project). Such laws, regulations, and standards are listed below. Laws, regulations, and standards that are not applicable to TRTP but are applicable to the buildout of the TWRA (including the proposed Alta Wind Project) are summarized below. Please see Section 3 for detailed descriptions.

6.7.2.1 Federal

Development of the TWRA would be subject to the federal Endangered Species Act and Migratory Bird Treaty Act. Areas meeting the regulatory definition of "Waters of the U.S." (jurisdictional waters) are subject to the jurisdiction of the U.S. Army Corps of Engineers (USACE) under provisions of Section 404 of the Clean Water Act (1972) and Section 10 of the Rivers and Harbors Act (1899). The TWRA does not include National Forest System lands, and is therefore not subject to the USDA Forest Service Land Management Plan (FLMP).

The West Mojave Plan (WMP) is "a habitat conservation plan and federal land use plan amendment that (1) presents a comprehensive strategy to conserve and protect the desert tortoise, the Mohave ground squirrel (MGS) and nearly 100 other sensitive plants and animals and the natural communities of which they are part, and (2) provides a streamlined program for complying with the requirements of the California and federal Endangered Species Acts" (BLM, 2005A).

Many areas within the TWRA are under the jurisdiction of the U.S. Department of the Interior Bureau of Land Management (BLM). BLM Manual 6840 provides a policy for the management of special-status species, including federally listed threatened and endangered species and designated critical habitats, federally proposed species and proposed critical habitats, candidate species, State listed species, and BLM designated Sensitive Species. Under BLM Manual 6840.06(E), the agency is required to treat all BLM Sensitive Species as, at a minimum, Candidate Species. The policy indicates that "BLM shall carry out management, consistent with the principles of multiple use, for the conservation of candidate species and their habitats and shall ensure that actions authorized, funded, or carried out do not contribute to the need to list any of these species as threatened or endangered."

6.7.2.2 State

Activities associated with development of the TWRA (including the proposed Alta Wind Project) would be subject to the same State requirements as would the proposed TRTP. Development of the TWRA (including the proposed Alta Wind Project) would be subject to the California Endangered Species Act. Activities that result in the diversion or obstruction of the natural flow of a stream, or which substantially change its bed, channel or bank, or which utilize any materials (including vegetation) from the streambed, may require that the project applicant enter into a Streambed Alteration Agreement with the CDFG.

6.7.2.3 Local

Kern County General Plan

The Kern County General Plan identifies the federal, State, and local statutes, ordinances, or policies that govern the conservation of biological resources that must be considered by Kern County during the decision-making process for any project that could impact biological resources. The Kern County General Plan includes the following goals and policies related to biological resources:

Policies

27. Threatened or endangered plant and wildlife species should be protected in accordance with State and federal laws.

28. County should work closely with State and federal agencies to assure that discretionary projects avoid or minimize impacts to fish, wildlife, and botanical resources.

29. 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.

30. The County will promote public awareness of endangered species laws to help educate property owners and the development community of local, State, and federal programs concerning endangered species conservation issues.

31. Under the provisions of the California Environmental Quality Act (CEQA), 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.

32. Riparian areas will be managed in accordance with United States Army Corps of Engineers, and the California Department of Fish and Game rules and regulations to enhance the drainage, flood control, biological, recreational, and other beneficial uses while acknowledging existing land use patterns.

Implementation Measures

Q. Discretionary projects shall consider effects to biological resources as required by the California Environmental Quality Act.

R. Consult and consider the comments from responsible and trustee wildlife agencies when reviewing a discretionary project subject to the California Environmental Quality Act.

S. Pursue the development and implementation of conservation programs with State and federal wildlife agencies for property owners desiring streamlined endangered species mitigation programs.

1.10.10 Oak Tree Conservation

Policies

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

66. Promote the conservation of oak tree woodlands for their environmental value and scenic beauty.

Implementation Measures

KK. The following applies to discretionary development projects (General Plan Amendment, zone change, conditional use permit, tract maps, parcel maps, precise development plan) that contains oak woodlands, which are defined as development parcels having canopy cover by oak trees of at least ten percent (10%), as determined from base line aerial photography or by site survey performed by a licensed or certified arborist or botanist. If this study is used in an Environmental Impact Report, then a Registered Professional Forester (RPF) shall perform the necessary analysis.

a. Development parcels containing oak woodlands are subject to a minimum canopy coverage retention standard of thirty percent (30%). The consultant shall include recommendations regarding thinning and diseased tree removal in conjunction with the discretionary project.

b. Use of aerial photography and a dot grid system shall be considered adequate in determining the required canopy coverage standard.

c. Adjustments below thirty percent (30%) minimum canopy standard may be made based on a report to assess the management of oak woodlands.

d. Discretionary development, within areas designated as meeting the minimum canopy standard, shall avoid the area beneath and within the trees unaltered drip line unless approved by a licensed or certified arborist or botanist.

LL. The following applies to development of parcels having oak tree canopy cover of less than ten percent (10%), but containing individual oak trees equal to or greater than a 12-inch diameter trunk at 4.5 feet breast height.

a. Such trees shall be identified on plot plans.

b. Discretionary development shall avoid the area beneath and within the trees unaltered drip line unless approved by a licensed or certified arborist or botanist.

c. Specified tree removal related to the discretionary action may be granted by the decision making body upon showing that a hardship exists based on substantial evidence in the record.

Kern County Zoning Ordinance

Wind development projects within the TWRA (including the proposed Alta Wind Project) would be required to incorporate the County's WE Combining District prior to development. The WE Combining District includes the following requirements relevant to biological resources for the approval, procedure, placement, and construction specifications for turbines and wind developments:

- Towers and blades shall be painted a nonreflective, unobtrusive color or have a nonreflective surface.
- Fencing shall be erected for each wind machine or on the perimeter of the total project. Wind project facilities shall be enclosed with a minimum four (4)-foot-high security fence constructed of four (4) strand barbed wire or materials of a higher quality. Fencing erected on the perimeter of the total project shall include minimum eighteen (18)-inch by eighteen (18)-inch signs warning of wind turbine dangers. Such signs shall be located a maximum of three hundred (300) feet apart and at all points of site ingress and egress. Where perimeter fencing is utilized, the planning director may waive this requirement for any portion of the site where unauthorized access is precluded due to topographic conditions.
- All wind projects including wind generators and towers shall comply with all applicable county, state, and federal laws, ordinances or regulations.
- Prior to the issuance of any grading permit, a plan for the mitigation of potential soil erosion and sedimentation shall be prepared by a registered civil engineer or other professional and submitted for the approval by the director of the engineering and survey services department. The plan shall include provisions for site re-vegetation, including any necessary re-soiling, proposed plant species, proposed plant density and percentage of ground coverage, and the methods and rates of application and shall include sediment collection facilities as may be required by the engineering and survey services department.
- Construction of any slopes steeper than four to one (4:1) shall be prohibited unless specifically authorized by the Kern County planning department and mitigation is provided.
- Wind project facilities shall be encircled with a ten (10) foot wide fuel break. Subject fuel breaks may be installed for each wind machine or the perimeter of the total project, but in no event shall encompass more than forty (40) acres per block. Permanent access roads may also

be considered fuel breaks. This requirement may be modified at the discretion of the Kern County fire chief.

6.7.3 Impact Analysis

This section explains how potential impacts to Biological Resources associated with development of the TWRA (including the proposed Alta Wind Project) are assessed. Section 6.7.3.1 presents the significance criteria upon which impact determinations are based. This section also briefly describes the methodology for determining the type and degree of impact that would be produced as a result of TWRA development. All impacts and mitigation measures identified for development of the TWRA are presented in Section 6.7.3.2.

6.7.3.1 Criteria for Determining Impact Significance

Impact significance is assessed based on the Kern County adopted Thresholds of Significance, which are based on the State CEQA Guidelines, Appendix G. Those criteria have been modified to reflect potential environmental impacts that are relevant to development of the TWRA. Impacts to Biological Resources would be considered significant if activities or actions associated with development of the TWRA (including the proposed Alta Wind Project) would:

- Criterion TWRA BIO1: Have a substantial adverse impact, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game (CDFG) or the U.S. Fish and Wildlife Service (USFWS).
- Criterion TWRA BIO2: Have a substantial adverse impact on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations, or by the CDFG or the USFWS.
- Criterion TWRA BIO3: Have a substantial adverse impact on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, and coastal wetlands), either individually or in combination with the known or probable impacts of other activities through direct removal, filling, hydrologic interruption, or other means.
- Criterion TWRA BIO4: Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors, or impede the use of wildlife nursery sites.
- Criterion TWRA BIO5: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Criterion TWRA BIO6: Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Communities Conservation Plan, or other approved local, regional, or State habitat conservation plan

This analysis first established baseline conditions for the affected environment and regional setting relevant to Biological Resources, presented above in Section 6.7.1. These baseline conditions were evaluated based on their potential to be affected by reasonably foreseeable construction activities as well as operation and maintenance activities for projects associated with development of the TWRA. Activities that are reasonably expected to occur through development of the TWRA, including construction and installation of wind turbines, operations and maintenance, and decommissioning, may extend over a period of 25 to 40 years. The specific locations and intensities of these development-related activities are currently unknown and therefore, this analysis of impacts to Biological Resources is based upon reasoned assumptions. It should be noted that this analysis attempts only to provide the reader with a very general discussion of the types of impacts likely to occur through the development of the TWRA. Project-specific

impacts for any reasonably foreseeable future development are unknown at this time; however, each project would be required to undergo a detailed analysis under CEQA and/or NEPA, which would illuminate the project's specific environmental impacts including those impacts to biological resources. General impacts to biological resources have been identified based on the predicted and reasonably foreseeable interactions between construction, operation, and maintenance activities with the affected environment.

6.7.3.2 Impacts and Mitigation Measures

The following section describes potential direct and indirect impacts and general mitigation measures related to Biological Resources that could occur as a result of wind projects developed in the TWRA (including the proposed Alta Wind Project). A summary of identified impacts and associated mitigation measures for the TWRA is presented in Table 6.20-1.

Impacts are classified as Class I (significant, cannot be mitigated to a level that is less than significant), Class II (significant, can be mitigated to a level that is less than significant), Class III (adverse, but less than significant), or Class IV (beneficial). Detailed discussions of each impact are presented below.

Candidate, Sensitive, or Special-Status Species (Criterion TWRA BIO1)

Projects associated with development of the TWRA would result in an impact to Biological Resources under Criterion TWRA BIO1 if associated construction, maintenance, operation, or decommissioning activities would result in impacts to candidate, sensitive, or special-status species.

Impact TWRA-BIO-1: Construction activities would result in direct or indirect loss of listed or sensitive plants or a direct loss of habitat for listed or sensitive plants.

Listed or sensitive plant species surveys have not been conducted for the entire TWRA, but as listed in Section 6.7.1.2 (Regional Setting), twenty-eight species have moderate to high potential to occur, and other species could occur as well. Impacts to special-status plant species and their habitats could occur through the removal of vegetation and grading for turbine pads, substations, transmission and meteorological towers, access roads, etc. Additionally, fugitive dust generated during construction activities can settle on nearby vegetation. This degrades the cuticle, or water-conserving protective barrier on the surface of leaves. Damage to the cuticle leads to increased water loss and reduced carbon dioxide uptake, thereby reducing photosynthesis (BLM, 2005b). This process can stress or even kill a plant, depending on the severity and duration of exposure to fugitive dust. Release of hazardous substances during construction could also affect nearby vegetation.

An assessment of impacts to special status plant species cannot be conducted without detailed survey data. Also, the size of a development, the siting, and the particular sensitive resources present at the locations of wind farm components would all determine what impact a particular development would have on listed or sensitive plants or their habitats. However, it is likely that surveys for most wind development projects located in the TWRA would result in a finding of significant impacts according to Significance Criterion TWRA BIO1. Therefore, the impacts to special-status plant species and their habitats must be considered significant and not mitigable. Implementation of Mitigation Measures TWRA-BIO-1a through TWRA-BIO-1n are suggested to reduce and compensate for impacts to special-status plant species.

Mitigation Measures for Impact TWRA-BIO-1:

TWRA-BIO-1a **Provide restoration/compensation for affected sensitive vegetation communities.** Surface-disturbing components of the project shall be located in previously disturbed areas or where habitat quality is poor to the extent possible, and disturbance of vegetation and soils shall be minimized. If avoidance of sensitive vegetation communities is not feasible, for example, due to physical or safety constraints, the applicant shall restore temporarily impacted areas to pre-construction conditions following construction (or emergency repairs) and shall permanently block off all public access to them, and/or shall purchase/dedicate suitable habitat for preservation to off-set permanently impacted areas. Restoration of some vegetation communities in temporarily impacted areas may not be possible if those areas are subject to vegetation management or if those vegetation communities require more than five years to reestablish. In those instances, the mitigation shall consist of off-site acquisition and preservation of the vegetation community instead. Restoration involves recontouring the land, replacing the topsoil, planting seed and/or container stock, and maintaining (i.e., weeding, replacement planting, supplemental watering, etc.) and monitoring the restored area for a period five years. Restoration in the TWRA shall be maintained and monitored for a minimum of five years. The success of the restoration is usually based on how the habitat compares with similar, nearby, undisturbed habitat. Any restoration efforts would be subject to a Habitat Restoration Plan approved by the Kern County, BLM (for development on BLM land), and Wildlife Agencies. Mitigation ratios shall be 2:1 in riparian areas and 1:1 in all other areas. The mitigation ratios also apply to impacts from emergency repairs.

All limits of construction shall be delineated with orange construction fencing. During and after construction, entrances to access roads shall be gated to prevent the unauthorized use of these roads by the general public. Signs prohibiting unauthorized use of the access roads shall be posted on these gates.

Any impacts associated with unauthorized activity (e.g., exceeding approved construction footprints) shall be mitigated at a 5:1 ratio. Restoration of the unauthorized impacts shall be credited at a 1:1 ratio (i.e., mitigated by in-place habitat restoration); the remaining 4:1 shall be acquired off site.

Areas to be restored shall include all areas temporarily impacted by construction, such as turbine construction sites, laydown/staging areas, temporary access and spur roads, and existing turbine locations where turbines are removed. Where on-site restoration is planned, the applicant shall identify a qualified Habitat Restoration Specialist to be approved by Kern County and BLM (if applicable), and the Wildlife Agencies. The Habitat Restoration Specialist shall prepare and implement a Habitat Restoration Plan for restoring temporarily impacted sensitive vegetation communities, to be approved by Kern County, Wildlife Agencies, and BLM (if applicable). The applicant shall work with Kern County, BLM (if applicable), and Wildlife Agencies until a plan is approved by all. This Habitat Restoration Plan must be approved in writing by the above-listed agencies prior to the initiation of any vegetation disturbing activities. Hydroseeding, drill seeding, or an otherwise proven restoration technique shall be utilized on all disturbed surfaces using a locally endemic native seed mix approved by Kern County, Wildlife Agencies, and BLM (if applicable). The Habitat Restoration Plan shall incorporate the measures identified in the May 25, 2006 Memorandum of Understanding among Edison Electric Institute, USDA Forest Service, BLM, USFWS, National Park Service, and the

Environmental Protection Agency (Edison Electric Institute, et al., 2006) where applicable. The MOU discusses vegetation management along ROWs for electrical transmission and distribution facilities on federal lands. The major provisions of the MOU include reducing soil erosion and water quality impacts; promoting local ecotypes in revegetation projects; planting native species and protecting rare species; and reducing the introduction of non-native, invasive or noxious plant species to the ROWs. The MOU can be viewed online at http://www.eei.org/industry_issues/environment/land/vegetation_management/EEI_MOU_FINAL_5-25-06.pdf.

The following habitat restoration requirements are not included in the MOU described above. The restoration of habitat shall be maintained and monitored for five years after installation by an experienced, licensed Habitat Restoration Contractor, or until established success criteria identified in the Restoration Plan (specified percent cover of native and non-native species, species diversity, and species composition as compared with an undisturbed reference site) are met. Maintenance and monitoring shall be conducted following a prescribed schedule to assess progress and identify potential problems with the restoration. Remedial action (e.g., additional planting, weeding, erosion control, use of container stock, supplemental watering, etc.) shall be taken by an experienced, licensed Habitat Restoration Contractor during the maintenance and monitoring period if necessary to ensure the success of the restoration. If the restoration fails to meet the established success criteria after the maintenance and monitoring period, maintenance and monitoring shall extend beyond the five-year period until the criteria are met or unless otherwise approved by Kern County, BLM (if applicable), and the Wildlife Agencies. For areas where habitat restoration cannot meet mitigation requirements, off-site purchase and dedication of habitat shall be provided at the mitigation ratios provided above or as otherwise required by the Wildlife Agencies.

Tree Mitigation. Mitigation for loss of native trees or native tree trimming shall be provided by (1) acquiring and preserving habitat within which the trees occur and/or (2) restoring (i.e., planting) trees on land that would not be subject to vegetation clearing (either in the applicant's ROW and/or on land acquired and preserved). Any land to be used for this mitigation shall be approved by Kern County, BLM (if applicable), and the Wildlife Agencies.

For habitat acquisition and preservation, the mitigation ratios shall follow those above. For example, removal of coast live oak trees (that occur in coast live oak woodland) shall require mitigation at a 1:1 ratio based on the permanent impact to the summed acreage of all individual coast live oak trees impacted. Therefore, if the total acreage of all individual coast live oak trees in coast live oak woodland impacted is 10 acres, then 10 acres of coast live oak woodland shall be acquired and preserved. For all trimmed native trees, the ratio shall be 1:1.

For restoration (planting trees), these guidelines, based on recommendations from the CDFG, shall be followed.

Native trees that are removed shall be replaced in-kind as follows.

- Trees less than five inches diameter at breast height (DBH) shall be replaced at 3:1
- Trees between five and 12 inches DBH shall be replaced at 5:1
- Trees between 12 and 36 inches shall be replaced at 10:1
- Trees greater than 36 inches shall be replaced at 20:1

Native trees that are trimmed shall be replaced in-kind as follows.

- Trees less than 12 inches DBH shall be replaced at 2:1
- Trees greater than 12 inches DBH shall be replaced at 5:1

All restoration shall be maintained and monitored for a minimum of five years. The restoration shall be directed according to a Habitat Restoration Plan approved by Kern County, BLM (if applicable), and the Wildlife Agencies.

Mitigation Parcels/Habitat Management Plans. All off-site mitigation parcels shall be approved by Kern County, BLM (if applicable), and the Wildlife Agencies and must be acquired prior to the initiation of vegetation disturbing activities. A Habitat Management Plan shall be prepared by a biologist approved by Kern County, BLM (if applicable), and the Wildlife Agencies for all acquired off-site mitigation parcels. The Habitat Management Plan must be approved in writing by Kern County, BLM (if applicable), and the Wildlife Agencies prior to the initiation of any vegetation disturbing activities. The applicant shall work with Kern County, BLM (if applicable), and the Wildlife Agencies until a plan is approved by all. The Habitat Management Plan shall provide direction for the preservation and in-perpetuity management of all acquired, off-site mitigation parcels. The Habitat Management Plan shall include, but shall not be limited to:

- Legal descriptions of all mitigation parcels approved by Kern County, BLM (if applicable), and the Wildlife Agencies
- Baseline biological data for all mitigation parcels
- Designation of a land management entity approved by Kern County, BLM (if applicable), and the Wildlife Agencies to provide in-perpetuity management
- A Property Analysis Record prepared by the designated land management entity that explains the amount of funding required to implement the Habitat Management Plan
- Designation of responsible parties and their roles (e.g., provision of endowment by the applicant to fund the Habitat Management Plan and implementation of the Habitat Management Plan by the designated land management entity)
- Management specifications including, but not limited to, regular biological surveys to compare with baseline; exotic, non-native species control; fence/sign replacement or repair, public education; trash removal; and annual reports to Kern County, BLM (if applicable), and the Wildlife Agencies.

TWRA-BIO-1b **Conduct biological monitoring.** Monitoring shall be provided by a qualified biologist approved by Kern County, BLM (if applicable), and the Wildlife Agencies to ensure that all impacts occur within designated limits. Monitoring entails communicating with contractors, taking daily notes, and ensuring that the requirements of the APMs and mitigation measures are being met by being present during construction activities. The qualified biologist shall conduct monitoring for any area subject to disturbance from construction activities. The applicant, its contractors and subcontractors, and their respective project personnel, shall refer all environmental issues, including wildlife relocation, injured or dead wildlife, hazardous waste, or questions about environmental impacts to the qualified biologist. Experts in wildlife handling may need to be brought in by the qualified biologist for assistance with wildlife relocations.

The qualified biologist shall have the authority to issue stop work orders if any part of the mitigation measures or APMs are being violated. The qualified biologist shall

immediately notify Kern County, BLM (if applicable), and the Wildlife Agencies of any significant events discovered during the monitoring. Reinitiation of work following a stop work order shall only occur when Kern County, BLM (if applicable), and the Wildlife Agencies are satisfied that the impacts have been fully documented, that compensation for these impacts shall be made, and that any additional protection measures they deem necessary shall be undertaken.

TWRA-BIO-1c **Perform protocol surveys.** The applicant would perform any detailed on-the-ground protocol surveys, with regard to specific sensitive plant or wildlife species whose habitat would be impacted by the project based on final design, in accordance with State or federal regulations or statutes. The applicant would submit results of these surveys to the USFWS and CDFG and consult on reasonable and feasible mitigation measures for potential impacts, prior to any ground disturbing activities in a particular area. Mitigation would prioritize avoidance as the primary means to address impacts. If avoidance is not feasible, then relocation/restoration would be implemented. Where relocation/restoration is not feasible or deemed not to fully address impacts, then mitigation through mitigation credits or if necessary compensation via another on- or off-site purchase or dedication of habitat at a ratio of 2:1 for impacts inside preserves and parks and 1:1 for impacts outside of preserves and parks would be identified and implemented.

TWRA-BIO-1d **Train project personnel.** Prior to construction, all the applicant's contractors, subcontractors and project personnel would receive training regarding the appropriate work practices necessary to effectively implement the biological APMs and to comply with the applicable environmental laws and regulations including appropriate wildlife avoidance, and impact minimization procedures, the importance of these resources and the purpose and necessity of protecting them; and methods for protecting sensitive ecological resources.

TWRA-BIO-1e **Construction and survey activities shall be restricted based on final design engineering drawings.** The area limits of project construction and survey activities would be predetermined based on the temporary and permanent disturbance areas noted on the final design engineering drawings, with activity restricted to and confined within those limits. Survey personnel shall keep survey vehicles on existing roads. During project surveying activities, brush clearing for footpaths, line-of-sight cutting, and land surveying panel point placement in sensitive habitat would require prior approval from the project biological resource monitor. Hiking off roads or paths for survey data collection is allowed year-round as long as other project-specific APMs are met. Stringing of new wire and reconductoring for the project would be allowed year round in sensitive habitats if the conductor is not allowed to drag on the ground or in brush and all vehicles used during stringing remain on project access roads. Where stringing requires that conductor drop within brush or drag on or through the brush or ground or vehicles leave project access roads, the applicant would perform a site survey to determine presence or absence of endangered nesting birds or other endangered species in the work area. The applicant would submit results of this survey to the USFWS and CDFG and consult on reasonable and feasible mitigation measures for potential impacts, prior to dropping wire in brush, dragging wire on the ground or through brush, or taking vehicles off project access roads. However, this survey would not replace the need for the applicant to perform detailed on-the-ground surveys as otherwise required by MM TWRA-BIO-1c. No paint or permanent discoloring agents would be applied to rocks or vegetation to indicate limits of survey or construction activity

where any sensitive biological resources or wildlife habitats are encountered in the field.

TWRA-BIO-1f **Build access roads at right angles to streambeds and washes.** To the extent feasible, access roads would be built at right angles to the streambeds and washes. Where it is not feasible for access roads to cross at right angles, the applicant would limit roads constructed parallel to streambeds or washes to a maximum length of 500 feet at any one crossing location. Such parallel roads would be constructed in a manner that minimizes potential adverse impacts on "waters of the U.S." or waters of the State. Streambed crossings and roads constructed parallel to streambeds would require review and approval of necessary permits from the ACOE, CDFG, and RWQCB. Culverts would be installed where needed for right angle crossings, but rock crossings would be utilized across most right angle drainage crossings. All construction and maintenance activities would be conducted in a manner that would minimize disturbance to vegetation, drainage channels and stream banks (e.g., structures would not be located within a stream channel, construction activities would avoid sensitive features). Prior to construction in streambeds and washes, the applicant would perform a pre-activity survey to determine the presence or absence of endangered riparian species. However, this survey would not replace the need for the applicant to perform detailed on-the-ground surveys as otherwise required by MM TWRA-BIO-1c.

TWRA-BIO-1g **Comply with all applicable environmental laws and regulations.** In the construction, operation, maintenance, and decommissioning of the project, the applicant shall comply with all applicable environmental laws and regulations, including, without limitation, those regulating and protecting wildlife and its habitat.

TWRA-BIO-1h **Restrict the construction of access and spur roads.** Except where not feasible due to physical or safety constraints, all project vehicle movement would be restricted to existing access roads and access roads constructed as a part of the project and determined and marked by the applicant in advance for the contractor, contractor-acquired accesses, or public roads. New access road construction for the project would be allowed year-round. However, when feasible, every effort would be made to avoid constructing roads during the avian nesting season (March 1 through August 31). When it is not feasible to keep vehicles on existing access roads or to avoid constructing new access roads during the nesting, breeding, or flight season, the applicant would perform a site survey in the area where the work is to occur. This survey would be performed to determine presence or absence of endangered nesting birds, or other endangered species in the work area. The applicant would submit results of this survey to the USFWS and CDFG and consult on reasonable mitigation measures to avoid or minimize potential impacts, prior to vehicle use off existing access roads or the construction of new access roads. However, this survey would not replace the need for the applicant to perform detailed on-the-ground surveys otherwise required by MM TWRA-BIO-1c. Parking or driving underneath oak trees is not allowed in order to protect root structures. In addition to regular watering to control fugitive dust created during clearing, grading, earth-moving, excavation, and other construction activities which could interfere with plant photosynthesis, a speed limit of 15 miles per hour shall be observed on dirt access roads to reduce dust and allow reptiles and small mammals to disperse.

All new access roads or spur roads constructed as part of the project that are not required as permanent access for future project maintenance and operation would be permanently closed and restored as required by MM TWRA-BIO-1a. Where required, roads would be permanently closed using the most effective feasible and least environmentally damaging methods appropriate to that area with the concurrence of the underlying landowner and the governmental agency having jurisdiction (e.g., stockpiling and replacing topsoil or rock replacement). This would limit new or improved accessibility into the area. Mowing of vegetation can be an effective method for protecting the vegetative understory while at the same time creating access to the work area. Mowing should be used when permanent access is not required since, with time, total re-vegetation is expected. If mowing is in response to a permanent access need, but the alternative of grading is undesirable because of downstream siltation potential, it should be recognized that periodic mowing would be necessary to maintain permanent access. The project biological construction monitor shall conduct checks on mowing procedures to ensure that mowing for temporary or permanent access roads is limited to a 14-foot-wide area on straight portions of the road and a 16- to 20-foot-wide area at turns, and that the mowing height is no less than 4 inches from finished grade.

TWRA-BIO-1i **Protect and restore vegetation.** In construction areas where re-contouring is not required, vegetation shall be left in place wherever possible to avoid excessive root damage and allow for re-sprouting.

Only the minimum amount of vegetation necessary for the construction of structures and facilities will be removed. Topsoil located in areas containing sensitive habitat shall be conserved during excavation and reused as cover on disturbed areas to facilitate re-growth of vegetation.

Disturbed soils shall be re-vegetated with an appropriate seed mix that does not contain invasive, non-native plant species.

TWRA-BIO-1j **Avoid sensitive features.** In areas designated as sensitive by the applicant or the resource agencies, to the extent feasible structures and access roads would be designed to minimize impacts to sensitive features. These areas of sensitive features include but are not limited to high-value wildlife habitats, sensitive vegetation communities, and high value plant habitats. If the sensitive features cannot be completely avoided, structures and access roads would be placed to minimize the disturbance to the extent feasible. When it is not feasible to avoid constructing project components or access roads in high value wildlife habitats, the applicant would perform a site survey to determine presence or absence of endangered species in sensitive habitats. The applicant would submit results of this survey to the USFWS and consult on mitigation measures for potential impacts, prior to constructing structures or access roads. However, this survey would not replace the need for the applicant to perform detailed on-the-ground surveys as otherwise required by MM TWRA-BIO-1c. Where it is not feasible for access roads to avoid sensitive water resource features, such as streambed crossings, such crossings would be built at right angles to the streambeds. Where such crossings cannot be made at right angles, roads constructed parallel to streambeds would be limited to a maximum length of 500 feet at any one crossing location. Such parallel roads would be constructed in a manner that minimizes potential adverse impacts on "waters of the U.S." and waters of the State. Streambed crossings or roads constructed

parallel to streambeds would require review and approval of necessary permits from the ACOE, CDFG, and RWQCB.

TWRA-BIO-1k **Conduct rare plant surveys, and implement appropriate avoidance/ minimization/compensation strategies.** A qualified biologist shall survey for special-status plants in the spring prior to initiating construction activities in a given area. A report of special-status plants observed shall be prepared and submitted for approval by Kern County, BLM (if applicable), and the Wildlife Agencies prior to activities which may impact the plant resources.

All special-status plant populations shall be staked or flagged by a qualified biologist approved by Kern County, BLM (if applicable), and the Wildlife Agencies. All stakes, flagging, or fencing shall be removed no later than 30 days after construction is complete.

Impacts to federal- or State-listed plant species shall first be avoided where feasible, and, where not feasible, impacts shall be compensated through salvage and relocation via a restoration program and/or off-site acquisition and preservation of habitat containing the plant at a 2:1 ratio. Avoidance may not be feasible due to physical or safety constraints. Kern County, BLM (if applicable), and the Wildlife Agencies shall decide whether the applicant can restore rare plant populations or shall acquire habitat with rare plant populations off site (locations to be approved by Kern County, BLM [if applicable], and the Wildlife Agencies). A qualified biologist shall prepare a Restoration Plan that shall indicate where restoration would take place. The restoration plan shall also identify the goals of the restoration, responsible parties, methods of restoration implementation, maintenance and monitoring requirements, final success criteria, and contingency measures. The applicant shall work with Kern County, BLM (if applicable), and the Wildlife Agencies until a plan is approved by all.

Impacts to moderately sensitive plant species (i.e., BLM Sensitive, CNPS List 1 and 2 species) shall first be avoided where feasible, and, where not feasible, impacts shall be compensated through reseeding (with locally collected seed stock) or relocation to temporarily disturbed areas. Avoidance may not be feasible due to physical or safety constraints. Mitigation Measure TWRA-BIO-1a would also provide habitat-based mitigation for these impacts.

Where reseeding or salvage and relocation is required, the applicant shall identify a qualified Habitat Restoration Specialist to be approved by Kern County, BLM (if applicable), and the Wildlife Agencies. The Habitat Restoration Specialist shall prepare and implement a Restoration Plan for reseeding or salvaging and relocating special-status plant species to be approved by Kern County, BLM (if applicable), and the Wildlife Agencies in writing prior to impacting the plant resources. The applicant shall work with the above-listed agencies until a plan is approved by all. The reseeding or relocation of plants shall be maintained and monitored for five years after installation, or until established success criteria are met, to assess progress and identify potential problems with the mitigation. Remedial action (e.g., additional seeding, weeding, erosion control, use of container stock, supplemental watering, etc.) shall be taken during the maintenance and monitoring period if necessary to ensure the success of the restoration. If the restoration fails to meet the established performance criteria after the five-year maintenance and monitoring period, maintenance and monitoring shall extend beyond the five-year period until

the criteria are met or unless otherwise approved by Kern County, BLM (if applicable), and the Wildlife Agencies.

A Habitat Management Plan for any required, off-site mitigation shall be prepared by a biologist approved by Kern County, BLM (if applicable), and the Wildlife Agencies. The Habitat Management Plan must be approved in writing by Kern County, BLM (if applicable), and the Wildlife Agencies prior to the initiation of any activities which may impact special status plant resources. The applicant shall work with Kern County, BLM (if applicable), and the Wildlife Agencies until a plan is approved by all. The Habitat Management Plan shall provide direction for the preservation and in-perpetuity management of all acquired off-site mitigation parcels. The Habitat Management Plan shall include, but shall not be limited to:

- Legal descriptions of all off-site mitigation parcels approved by Kern County, BLM (if applicable), and the Wildlife Agencies
- Baseline biological data for all mitigation parcels
- Designation of a land management entity approved by Kern County, BLM (if applicable), and the Wildlife Agencies to provide in-perpetuity management
- A Property Analysis Record prepared by the designated land management entity that explains the amount of funding required to implement the Habitat Management Plan
- Designation of responsible parties and their roles (e.g., provision of endowment by the applicant to fund the Habitat Management Plan and implementation of the Habitat Management Plan by the designated land management entity)
- Management specifications including, but not limited to, regular biological surveys to compare with baseline; exotic, non-native species control; fence/sign replacement or repair, public education; trash removal; and annual reports to Kern County, BLM (if applicable), and the Wildlife Agencies.

TWRA-BIO-1l **Delineate sensitive plant populations.** Prior to construction, plant population boundaries designated as sensitive by USFWS or CDFG and other resources designated sensitive by the applicant and resource agencies would be clearly delineated with plainly visible flagging or fencing, which shall remain in place for the duration of construction. Flagged areas would be avoided to the extent practicable during construction activities in that area. Where these areas cannot be avoided, focused surveys for covered plant species shall be performed in conformance with Mitigation Measures TWRA-BIO-1c and TWRA-BIO-1k, and the responsible resource agency(s) would be consulted for appropriate mitigation and/or revegetation measures prior to disturbance. Notification of presence of any covered plant species to be removed in the work area would occur within ten (10) working days prior to project activity, during which time the USFWS or CDFG may remove such plant(s) or recommend measures to minimize or reduce the take. If neither USFWS nor CDFG has removed such plant(s) within ten (10) working days following written notice, the applicant may proceed with work and cause a take of such plant(s), if minimization measures are not implemented.

TWRA-BIO-1m **No collection of plants or wildlife.** Plant or wildlife species may not be collected for pets or any other reason.

TWRA-BIO-1n **Salvage sensitive species for replanting or transplanting.** Species identified as sensitive by the land managing agency shall be salvaged where avoidance is not feasible in accordance with State law. Generally, salvage may include removal and stockpiling for replanting on site, removal and transplanting out of surface

disturbance area, removal and salvage by private individuals, and removal and salvage by commercial dealers, or any combination.

CEQA Significance Conclusion

Implementation of Mitigation Measures TWRA-BIO-1a through TWRA-BIO-1n would reduce the potential for project construction, operation, maintenance, or decommissioning to cause substantial impacts to sensitive plants or their habitats. However, without detailed surveys and project-specific siting information it is unknown how future projects developed in the TWRA would impact sensitive plants and their habitats, and therefore these impacts would remain significant and unavoidable (Class I).

Impact TWRA-BIO-2: Construction activities, including the use of access roads, would result in disturbance to wildlife and result in wildlife mortality.

Adverse effects to general (i.e., non-special status) wildlife would occur during construction, operation, and maintenance of projects developed in the TWRA. These effects would occur due to the removal of vegetation that would result in the temporary and/or permanent loss of wildlife habitat along with the displacement and potential mortality of resident wildlife species that are poor dispersers such as snakes, lizards, and small mammals. Construction may also result in the temporary degradation of the value of adjacent native habitat areas due to noise, increased human presence, erosion, and vehicle traffic. The extent of concurrent development is unknown at this time, and if several adjacent wind developments are under construction at the same time, impacts to wildlife in the area could be substantial. Mitigation Measures TWRA-BIO-1a, TWRA-BIO-1b, TWRA-BIO-1e, TWRA-BIO-1h, and TWRA-BIO-2a through TWRA-BIO-2f are recommended to reduce the disturbance to wildlife and reduce wildlife mortality.

Mitigation Measures for Impact TWRA-BIO-2:

TWRA-BIO-1a **Provide restoration/compensation for affected sensitive vegetation communities.**

TWRA-BIO-1b **Conduct biological monitoring.**

TWRA-BIO-1e **Construction and survey activities shall be restricted based on final design engineering drawings.**

TWRA-BIO-1h **Restrict the construction of access and spur roads.**

TWRA-BIO-2a **Identify environmentally sensitive times and locations for tree trimming.** Environmentally sensitive tree trimming locations for the project would be identified by an approved biologist. The biological field construction monitor shall be contacted prior to trimming in environmentally sensitive areas. Whenever feasible, trees in environmentally sensitive areas, such as areas of riparian or native scrub vegetation, would be scheduled for trimming during non-sensitive (i.e., outside breeding or nesting) times. Where trees cannot be trimmed during non-sensitive times, the applicant would perform a site survey to determine presence or absence of nesting bird species in riparian or native scrub vegetation. The applicant would submit results of this survey to the USFWS and CDFG and consult on mitigation measures for potential impacts, prior to tree trimming in environmentally sensitive areas. However, this survey would not replace the need for the applicant to perform detailed on-the-ground surveys as otherwise required by Mitigation Measure TWRA-BIO-1c. Where riparian areas with over-story vegetation are crossed, tree removal (i.e., clear-cut) widths would be varied where feasible to minimize visual landscape contrast and to maintain habitat diversity at established wildlife corridor

edges. Where tree removal widths cannot be varied, the applicant would consult with the USFWS and CDFG to develop alternative tree removal options that could reasonably maintain edge diversity.

TWRA-BIO-2b **Littering is not allowed.** Project personnel would not deposit or leave any food or waste in the project area, and no biodegradable or non-biodegradable debris would remain in the project area following completion of construction.

TWRA-BIO-2c **Survey areas for brush clearing.** Brush clearing around any project facilities (e.g., turbines, substations, etc.) for fire protection, visual inspection or project surveying, in areas which have been previously cleared or maintained within a two-year or shorter period shall not require a pre-activity survey. In areas not cleared or maintained within a two-year period, brush clearing shall not be conducted during the breeding season (March through August) without a pre-activity survey for vegetation containing active nests, burrows, or dens. The pre-activity survey performed by the on-site biological resource monitor would make sure that the vegetation to be cleared contains no active migratory bird nests, burrows, or active dens prior to clearing. If occupied migratory bird nests are present, fire protection or visual inspection brush clearing work would be avoided until after the nesting season, or until the nest becomes inactive. If no nests are observed, clearing may proceed. Where burrows or dens are identified in the reconnaissance-level survey, soil in the brush clearing area would be sufficiently dry before clearing activities occur to prevent mechanical damage to burrows that may be present.

TWRA-BIO-2d **Protect mammals and reptiles overnight in excavated areas.** Construction holes or trenches to be left open over night shall be covered. Covers shall be secured in place nightly, prior to workers leaving the site, and shall be strong enough to prevent livestock or wildlife from falling through and into a hole. Holes and/or trenches shall be inspected prior to filling to ensure absence of mammals, amphibians, and reptiles.

Excavations shall be sloped on one end to provide an escape route for wildlife.

TWRA-BIO-2e **Reduce construction night lighting on sensitive habitats.** Reduce construction night lighting on sensitive habitats. Exterior lighting within the project area adjacent to preserved habitat shall be of the lowest illumination allowed for human safety, selectively placed, shielded, and directed away from preserved habitat to the maximum extent practicable. Nighttime vehicle traffic associated with project activities would be kept to a minimum volume and speed to prevent mortality of nocturnal wildlife species that may be moving about.

TWRA-BIO-2f **Cover all steep-walled trenches or excavations used during construction to prevent the entrapment of wildlife (e.g., reptiles and small mammals).** All steep-walled trenches or excavations used during construction shall be covered at all times except when being actively utilized. If the trenches or excavations cannot be covered, exclusion fencing (i.e., silt fencing) shall be installed around the trench or excavation to prevent entrapment of wildlife. Open trenches, or other excavations that could entrap wildlife shall be inspected by the biological monitor a minimum of three times per day and immediately before backfilling. Furthermore, employees and contractors shall look under vehicles and equipment for the presence of wildlife before movement. If wildlife is observed, no vehicles or equipment would be moved until the animal has left voluntarily or is removed by the biological monitor. Should a dead or injured listed species be found in a trench or excavation or

anywhere in the construction zone or along an access road, the biological monitor shall contact Kern County, BLM (if applicable), and the Wildlife Agencies within 48 hours of the finding. The biological monitor shall report the species found, the location of the finding, the cause of death (if known), and shall submit a photograph and any other pertinent information.

CEQA Significance Conclusion

Implementation of Mitigation Measures TWRA-BIO-1a, TWRA-BIO-1b, TWRA-BIO-1e, TWRA-BIO-1h, and TWRA-BIO-2a through TWRA-BIO-2f would substantially reduce impacts to wildlife species through such measures as minimizing potentially harmful activities, monitoring construction, and through protective measures such as covering excavations, eliminating litter that may draw wildlife to the project area, and not moving machinery or vehicles until the absence of wildlife is verified. Therefore, with the implementation of the mitigation measures described above, Impact TWRA-BIO-2 would be less than significant (Class II).

Impact TWRA-BIO-3: Construction activities would result in direct or indirect loss of listed or sensitive wildlife or a direct loss of habitat for listed or sensitive wildlife.

Impacts to listed or sensitive wildlife could occur through the loss of habitat and/or accidental death of individuals during construction of wind developments in the TWRA. In addition, individuals near the construction area may temporarily abandon their territories due to disturbance from noise and human activity. These impacts would be significant according to Significance Criterion TWRA BIO1.

Without detailed survey and siting information, it is not possible to completely assess the impacts to listed or sensitive species. In the absence of this detailed information, impacts to listed or sensitive wildlife are considered substantial. Most of the special status wildlife species likely to occur in the TWRA inhabit sensitive vegetation communities; therefore, the mitigation for the loss of the sensitive vegetation communities (see Mitigation Measures for Impact TWRA-BIO-1) would normally compensate for the potential loss of sensitive species and their habitats. However, since adequate land required by Mitigation Measure TWRA-BIO-1a may not be available, the impacts to the wildlife species are considered substantial. Implementation of Mitigation Measures TWRA-BIO-1a through TWRA-BIO-1e, TWRA-BIO-1g, TWRA-BIO-1h, TWRA-BIO-1m, TWRA-BIO-2a through TWRA-BIO-2f, and TWRA-BIO-3 are suggested to compensate, at least in part, for impacts to listed or sensitive wildlife species.

Mitigation Measures for Impact TWRA-BIO-3:

TWRA-BIO-1a **Provide restoration/compensation for affected sensitive vegetation communities.**

TWRA-BIO-1b **Conduct biological monitoring.**

TWRA-BIO-1c **Perform Protocol Surveys.**

TWRA-BIO-1d **Train Project Personnel**

TWRA-BIO-1e **Construction and survey activities shall be restricted based on final design engineering drawings.**

TWRA-BIO-1g **Comply with all applicable environmental laws and regulations.**

TWRA-BIO-1h **Restrict the construction of access and spur roads.**

TWRA-BIO-1m **No collection of plants or wildlife.**

TWRA-BIO-2a **Identify environmentally sensitive times and locations for tree trimming.**

TWRA-BIO-2b **Littering is not allowed.**

TWRA-BIO-2c **Survey areas for brush clearing.**

TWRA-BIO-2d **Protect mammals and reptiles in excavated areas.**

TWRA-BIO-2e **Reduce construction night lighting on sensitive habitats.**

TWRA-BIO-2f **Cover all steep-walled trenches or excavations used during construction to prevent the entrapment of wildlife (e.g., reptiles and small mammals).**

TWRA-BIO-3 **Survey for bat nursery colonies.** A CDFG-approved biologist shall conduct a habitat assessment for bat nursery colonies prior to any construction activity. Then, the approved biologist shall conduct a survey for bat nursery colonies or signs of such colonies prior to construction. Direct impacts to a nursery colony site shall not be allowed, and approach of, or entrance to, an active nursery colony site shall be prohibited. Before any blasting or drilling in the vicinity of a nursery colony site, the CDFG-approved biologist shall work with the construction crew to devise and implement methods to minimize potential indirect impacts to the nursery colony site from falling rock or substantial vibration (while a nursery colony is active). The methods shall include an option to halt any construction activity that would cause falling rock, substantial vibration impacts, or any other construction-related impact to a nursery colony as determined by the approved biologist, until the colony is inactive. Should falling rock block the entrance to a nursery colony site, the contractor shall work with the approved biologist to re-open an entrance to the site.

CEQA Significance Conclusion

Implementation of Mitigation Measures TWRA-BIO-1a through TWRA-BIO-1e, TWRA-BIO-1g, TWRA-BIO-1h, TWRA-BIO-1m, TWRA-BIO-2a through TWRA-BIO-2f, and TWRA-BIO-3 would reduce the potential for project-related activities to impact sensitive or listed wildlife or their habitats. However, without detailed surveys and project-specific siting information it is unknown how future projects developed in the TWRA would impact sensitive wildlife and their habitats, and therefore these impacts would remain significant and unavoidable (Class I).

Impact TWRA-BIO-4: Direct or indirect loss of Mojave ground squirrel or direct loss of habitat.

The Mojave ground squirrel (MGS) has been identified in the southern portions of the TWRA during surveys for other projects (see TRTP Biological Specialist Report). Since no protocol surveys for MGS were completed for this project, all potential MGS habitat is assumed to be occupied by the MGS. With the lack of definitive survey data, the project construction must be assumed to have a substantial impact on this species. Since adequate land required by Mitigation Measure TWRA-BIO-4c may not be available, the impacts to this species are considered substantial. However, implementation of Mitigation Measures TWRA-BIO-1a, TWRA-BIO-1b, and TWRA-BIO-4a through TWRA-BIO-4c are suggested to, at least in part, compensate for impacts to the MGS.

Mitigation Measures for Impact TWRA-BIO-4:

TWRA-BIO-1a **Provide restoration/compensation for affected sensitive vegetation communities.**

TWRA-BIO-1b **Conduct biological monitoring.**

TWRA-BIO-4a **Conduct focused surveys for Mohave ground squirrels.** Surveys for Mohave ground squirrels shall be performed in the portion of the project area containing potential Mohave ground squirrel habitat. These surveys shall be performed by a qualified biologist according to CDFG's *Mohave Ground Squirrel Survey Guidelines* (January, 2003). Surveys for Mohave ground squirrel are performed between March 15 and July 15 using standard live trapping techniques. Three weeks of trapping are required during this time, although trapping will cease once a Mohave ground squirrel is captured or observed. The trapping grids each contain 100 traps arranged in 4 rows of 25 and spaced 35 meters apart, for a total grid length of one-half mile. The layout proscribed by CDFG shall determine the total number of grids required.

If these surveys obtain positive results for Mohave ground squirrel, or if Mohave ground squirrel presence is assumed within potential habitat, the applicant shall obtain incidental take authorization from CDFG. This authorization will likely include mitigation measures TWRA-BIO-4b and TWRA-BIO-4c below.

TWRA-BIO-4b **Implement Construction Monitoring and Worker Environmental Awareness Program.** To reduce the potential of take of Mohave ground squirrels, and prior to ground disturbing activity, a qualified biologist will deliver a Worker Environmental Awareness Program (WEAP) on the ecology of the Mohave ground squirrel to the construction employees. A qualified biological monitor shall be on site during initial ground disturbing activities. The name and phone number of the biological monitor shall be provided to a CDFG regional representative at least fourteen (14) days before ground disturbing activities. If the biological monitor observes a living Mohave ground squirrel on the construction site and/or determines that a Mohave ground squirrel was killed by project related activities during construction or otherwise found dead, a written report will be sent to CDFG within five (5) calendar days. The report will include the date, time of the finding or incident (if known), location of the carcass and the circumstances (if known). Mohave ground squirrel remains shall be collected and frozen as soon as possible. CDFG shall be contacted as to the ultimate disposition of the remains.

TWRA-BIO-4c **Preserve Off-site Habitat for Mohave Ground Squirrel.** To mitigate potential impacts from project construction, the applicant will acquire habitat occupied by Mohave ground squirrels based on the following ratios previously approved by the CDFG for projects in the region:

- Five acres of off-site habitat supporting Mohave ground squirrels will be preserved for each acre of native creosote bush scrub habitat and Joshua tree woodland habitat within the Kern County Study Area of the Habitat Conservation Area (HCA) delineated in the WMP (Rosamond Boulevard to Oak Creek Road – see habitat description in species account).
- Three acres of off-site habitat supporting Mohave ground squirrels will be preserved for each acre of native creosote bush scrub habitat and Joshua tree woodland habitat outside of the HCA delineated in the WMP (Rosamond Boulevard to Oak Creek Road– see habitat description in species account).
- One acre of off-site habitat supporting Mohave ground squirrels will be preserved for each acre of saltbrush scrub habitat (including inclusions of desert wash) impacted by the project outside of the HCA delineated in the WMP (Rosamond Boulevard to Oak Creek Road– see habitat description in species account).
- One-half acre of off-site habitat supporting Mohave ground squirrels will be preserved for each acre of desert scrub habitat impacted by the project outside of the HCA

delineated in the WMP (Rosamond Boulevard to Oak Creek Road– see habitat description in species account).

- No mitigation will occur for agricultural, non-native annual grassland, developed, or compacted barren ground within the project area

Mitigation acquisition shall occur at a CDFG-approved location such as the Desert Tortoise Research Natural Area in Kern County and shall be coordinated through a CDFG-approved entity. The applicant shall enter into a binding legal agreement regarding the preservation of off-site lands describing the terms of the acquisition, enhancement, and management of those lands. Fee title to acquired habitat lands, or a conservation easement over these lands, shall be transferred to CDFG or to an entity approved by CDFG and Kern County, along with money for enhancement of the land and an endowment for permanent management of the lands. If it is determined that Joshua tree woodland and/or Juniper woodland preserved through implementation of Mitigation Measure TWRA-BIO-1a detailed above also supports Mojave ground squirrel populations, these off-site lands can be used to satisfy the requirements of this mitigation measure.

CEQA Significance Conclusion

Construction activities may result in "take" (i.e., mortality or injury) of individual Mohave ground squirrels within suitable habitat in the TWRA area. Furthermore, wind development may result in loss of habitat due to both permanent structures and/or roads, and disturbance from construction activities. Take of this State-listed species or loss of habitat would constitute a significant impact. Because site-specific project details are unknown at this time, impacts to the Mojave ground squirrel are considered significant and unavoidable (Class I). Mitigation Measures TWRA-BIO-1a, TWRA-BIO-1b, and TWRA-BIO-4a through TWRA-BIO-4c are recommended to reduce impacts to Mojave ground squirrel.

Impact TWRA-BIO-5: Direct or indirect loss of Desert tortoise or direct loss of habitat.

Although focused surveys of the suitable habitat within the entire TWRA have not been conducted, previous surveys for projects in the southern portion of the TWRA detected potential abandoned desert tortoise burrows *(Pre-Construction Desert Tortoise Survey, Antelope Transmission Line Project Segments 2 and 3, Mitigation Measure B-6B, October 2007)*. Thus, the desert tortoise has a moderate potential to occur in the TWRA. Construction and maintenance activities could result in "take" (i.e., mortality or injury) of individual desert tortoises during ground disturbance, use of dirt access roads, or other activities located within areas designated as "Survey Areas" in the West Mojave Plan (WMP) (BLM, 2005a). If present, take of this State and federally threatened species would be authorized only through the context of a Biological Opinion issued from the USFWS and an Incidental Take Authorization from the CDFG. Implementation of the following mitigation measures would avoid take if present, thereby reducing impacts.

Mitigation Measures for Impact TWRA-BIO-5:

TWRA-BIO-1a **Provide restoration/compensation for affected sensitive vegetation communities.**

TWRA-BIO-1b **Conduct biological monitoring.**

TWRA-BIO-5a **Obtain Technical Assistance from the USFWS for Desert Tortoise.** The applicant shall request technical assistance from the USFWS and CDFG to review the potential for desert tortoise to occupy suitable habitat within the project area and to obtain

concurrence that the applicant's proposed measures along with Mitigation Measure TWRA-BIO-5b would avoid impacts to this listed species.

TWRA-BIO-5b **Conduct Focused Clearance Surveys in Designated Areas.** The applicant shall contract with a qualified biologist to conduct focused clearance surveys for desert tortoise prior to construction activities located within areas designated in the WMP as desert tortoise "Survey Areas." Clearance surveys shall follow the USFWS desert tortoise survey protocol, as modified within the WMP. If present, the applicant shall develop and implement a mitigation and monitoring plan that includes the following measures in consultation with the USFWS and CDFG.

- The applicant shall retain a qualified biologist with demonstrated expertise with desert tortoise to monitor all construction activities and assist the applicant in the implementation of the monitoring program. This person will be approved by the USFWS prior to the onset of ground-disturbing activities. This biologist will be referred to as the "authorized biologist" hereafter. The authorized biologist will be present during all activities immediately adjacent to or within habitat that supports desert tortoise.
- Prior to the onset of construction activities, the applicant shall provide all personnel who will be present on work areas within or adjacent to the project area the following information:
  a. A detailed description of the desert tortoise including color photographs;
  b. The protection the desert tortoise receives under the Endangered Species Act and possible legal action or that may be incurred for violation of the Act;
  c. The protective measures being implemented to conserve the desert tortoises and other species during construction activities associated with the proposed project; and
  d. A point of contact if desert tortoises are observed.
- All trash that may attract predators of desert tortoises will be removed from work sites or completely secured at the end of each work day.
- Prior to the onset of any construction activities, the applicant shall meet on-site with staff from the USFWS and the authorized biologist. The applicant shall provide information on the general location of construction activities within habitat of the desert tortoises and the actions taken to reduce impacts to this species. Because desert tortoise may occur in various locations during different seasons of the year, the applicant, USFWS, and authorized biologists will, at this preliminary meeting, determine the seasons when specific construction activities would have the least adverse effect on desert tortoise. For example, construction during the time of year when desert tortoises are dormant would reduce impacts to this species. The goal of this effort is to reduce the level of mortality of desert tortoise during construction.
- Where construction can occur in habitat where desert tortoises are widely distributed, work areas will be fenced in a manner that prevents equipment and vehicles from straying from the designated work area into adjacent habitat. The authorized biologist will assist in determining the boundaries of the area to be fenced in consultation with the USFWS/CDFG/Kern County/BLM (if applicable). All workers will be advised that equipment and vehicles must remain within the fenced work areas. Installation of the fencing and any necessary surveys will be directed and/or conducted by the authorized biologist in concurrence with the USFWS/CDFG/Kern County/BLM (if applicable).
- If desert tortoises are found within an area that has been fenced to exclude the species, activities will cease until the authorized biologist moves the desert tortoises.

- If desert tortoises are found in a construction area where fencing was deemed unnecessary, work will cease until the authorized biologist moves the individual(s). The authorized biologist in consultation with USFWS/CDFG/Kern County/BLM (if applicable) will then determine whether additional surveys or fencing are needed. Work may resume while this determination is being made, if deemed appropriate by the authorized biologist.
- Any desert tortoises found during clearance surveys or otherwise removed from work areas will be placed in nearby suitable, undisturbed habitat. The authorized biologist will determine the best location for their release, based on the condition of the vegetation, soil, and other habitat features and the proximity to human activities. Clearance surveys shall occur on a daily basis in the work area.
- The authorized biologist will have the authority to stop all activities until appropriate corrective measures have been completed.
- Staging areas for all construction activities will be located on previously disturbed upland areas designated for this purpose. All staging areas will be fenced.
- The applicant shall restrict work to daylight hours, except during an emergency, in order to avoid nighttime activities when desert tortoise may be present on the access road. Traffic speed should be maintained at 15 mph or less in the work area.

CEQA Significance Conclusion

Construction activities may result in "take" (i.e., mortality or injury) of individual desert tortoises within suitable habitat in the TWRA area. Furthermore, wind development may result in loss of habitat due to both permanent structures and/ or roads, and disturbance from construction activities. Take of this federal- and State-listed species or loss of habitat would constitute a significant impact. Because desert tortoises have a moderate potential to occur, and the majority of the TWRA is located west of the known populations of desert tortoise, Mitigation Measures B1a, B1b, TWRA-BIO-5a, and B5b are considered adequate to reduce impacts to desert tortoises to a less-than-significant level (Class II).

Impact TWRA-BIO-6: Direct or indirect loss of California condor or direct loss of habitat.

The California condor is considered present in the southwest portion of the TWRA. A condor conservation area is located to the west of the southern portion of the TWRA on Tejon Ranch, and condors from this area likely forage over open grasslands in the TWRA. In addition, condors continue to be released and the population on Southern California is expected to continue to grow (Grantham, 2008). The TWRA falls within the historic range of the condor, and they are expected to move through the area. The southwestern portion of the TWRA is adjacent to designated critical habitat for the California condor (see Figure 6.7-2), and they occur on Tejon Ranch immediately to the west of the TWRA. Suitable nesting habitat may occur within the TWRA, and suitable foraging habitat is widespread throughout the TWRA. Although condors are not known to regularly use any particular site within the TWRA, they are expected to occur broadly over the area during foraging trips. The greatest concern to condors in the TWRA is the potential to collide with power lines and wind turbines. Bird collisions with power lines and turbines generally occur when a power line or other aerial structure transects a daily flight path used by a concentration of birds, and migrants are traveling at reduced altitudes and encounter tall structures in their path (Brown, 1993). Seven condors died due to collisions or electrocutions in California from December 1988 to June 1999 (Meretsky et al., 2000).

Direct impacts to condors could occur through the loss of or disruption of foraging habitat, impacts or electrocution with wind turbines or associated transmission lines, the introduction of microtrash, or exposure to ethylene glycol anti-freeze. Indirect effects could result from loss of foraging habitat or

disruption of breeding activity through the use of new roadways and subsequent increases in human disturbance.

Construction activities associated with wind turbine and transmission tower construction would result in the clearing of large open areas on hill tops and ridges. Construction debris, litter, leaking equipment, or road kill can attract this species to the project area. Condors are curious birds and have been documented in close association with oil pumps and human activity on the Los Padres National Forest. Adverse effects to condors have also been documented by the animal's collection of micro trash (i.e. broken glass, paper and plastic waste, small pieces of metal). This waste is often brought back to nest sites where young birds ingest the material, which can lead to mortality of the young birds. Ethylene glycol, a component in antifreeze and petroleum products, can also be ingested by condors, ultimately leading to death.

The loss of foraging habitat from the TWRA is expected to be minimal and restoration of disturbed sites would be completed at the conclusion of construction. Most foraging occurs in open terrain of foothills, grasslands, potreros with chaparral areas, or oak savannah habitats. Water is required for drinking and bathing. In addition, condors that occur in the region forage on carrion and occur primarily at feeding stations located within the condor preserve on Tejon Ranch west of the TWRA.

Any adverse effects to this federally and State endangered bird would be considered substantial. Mitigation Measures TWRA-BIO-1a and TWRA-BIO-2b are recommended to reduce adverse effects to the California condor.

Mitigation Measures for Impact TWRA-BIO-6:

TWRA-BIO-1a **Provide restoration/compensation for affected sensitive vegetation communities.**

TWRA-BIO-2b **Littering is not allowed.**

CEQA Significance Conclusion

Construction activities associated with wind turbine and meteorological and transmission tower construction or operation could result in impacts to the California condor, if present. Project actions that result in the take of this species would only be authorized through the context of a Biological Opinion from the USFWS.

Impacts to condors from exposure to loss of habitat, perch sites, or micro trash would be considered significant. As described above, applicants shall implement Mitigation Measures TWRA-BIO-1a and TWRA-BIO-2b to avoid or mitigate take, including the loss of habitat and the potential for micro-trash ingestion. Implementation of these measures would reduce impacts to this species, but not to a level of less than significant because any loss of the California condor would be significant (Class I).

Impact TWRA-BIO-7: Construction activities would result in a potential loss of nesting birds.

The TWRA contains a variety of vegetation communities that provide nesting habitat for resident and migratory birds. Construction activities would disturb vegetation and have the potential to impact nesting birds during the breeding season (March through August). Ground-nesting birds could also be impacted by foot or vehicle/equipment traffic. The removal of vegetation and other construction activity during the breeding season could result in the displacement of breeding birds, abandonment of active nests, and accidental nest destruction. With the exception of a few non-native bird species, an active bird nest is fully protected against take pursuant to the federal Migratory Bird Treaty Act. It is unlawful to take, possess, or destroy the nest, eggs, or young of any such bird. To ensure no adverse effects to nesting birds,

Mitigation Measures TWRA-BIO-1e through TWRA-BIO-1h, TWRA-BIO-2a, TWRA-BIO-2c, TWRA-BIO-7a, and TWRA-BIO-7b are recommended.

Mitigation Measures for Impact TWRA-BIO-7:

TWRA-BIO-1e **Construction and survey activities shall be restricted based on final design engineering drawings.**

TWRA-BIO-1f **Build access roads at right angles to streambeds and washes.**

TWRA-BIO-1g **Comply with all applicable environmental laws and regulations.**

TWRA-BIO-1h **Restrict the construction of access and spur roads.**

TWRA-BIO-1j **Avoid sensitive features.**

TWRA-BIO-2a **Identify environmentally sensitive times and locations for tree trimming.**

TWRA-BIO-2c **Survey areas for brush clearing.**

TWRA-BIO-7a **Conduct pre-construction surveys and monitoring for breeding birds.** All vegetation clearing, except tree trimming or removal, shall take place between September 16 and February 14 (i.e., outside of the general avian breeding season of February 15 through September 15). Tree removal or trimming shall take place between September 16 and December 31 (i.e., outside the raptor breeding season of January 1 through September 15).

If project construction (not vegetation clearing or tree trimming/removal) cannot occur completely outside the general avian breeding season, then pre-construction surveys for bird species' nests shall be conducted by a qualified biologist within 300 feet of the construction zone no more than seven days prior to the initiation of construction that would occur between February 15 and September 15.

If project construction (not vegetation clearing or tree trimming/removal) cannot occur completely outside the raptor breeding season, then pre-construction surveys for active raptor nests shall be conducted by a qualified biologist within 500 feet of the construction zone no more than seven days prior to the initiation of construction that would occur between January 1 and September 15.

If no active nests are observed, construction may proceed. If active nests are found, work may proceed provided that construction activity is 1) located at least 500 feet from raptor nests, 2) located at least 160 to 250 feet from occupied burrowing owl burrows, 3) located at least 300 feet from all other bird nests, and 4) noise levels do not exceed 60 dB(A)hourly Leq at the edge of nesting territories as determined by a qualified biologist in coordination with a qualified acoustician. In the case of raptors (except the burrowing owl), the noise level restriction stated above does not apply. Otherwise, if the noise meets or exceeds the 60 dB(A) Leq threshold, or if the biologist determines that the construction activities are disturbing nesting activities, the biologist shall have the authority to halt the construction and shall devise methods to reduce the noise and/or disturbance in the vicinity. This may include methods such as, but not limited to, turning off vehicle engines and other equipment whenever possible to reduce noise, installing a protective noise barrier between the nest site and the construction activities, and working in other areas until the young have fledged. If noise levels still exceed 60 dB(A) Leq hourly at the edge of nesting territories and/or a no-construction buffer cannot be maintained, construction shall be deferred in that area until the nestlings have fledged. All active nests shall be monitored on a weekly basis until the nestlings fledge. The qualified biologist shall be responsible for documenting the results of the surveys

and the ongoing monitoring and for reporting these results to Kern County, BLM (if applicable), and the Wildlife Agencies.

TWRA-BIO-7b Removal of raptor nests.

1. Prior to construction, the applicant shall remove all existing raptor nests from structures that would be affected by project construction.
2. Removal of nests shall occur outside the raptor breeding season (January to July).
3. If it is necessary to remove an existing raptor nest during the breeding season, a qualified biologist shall survey the nest prior to removal to determine if the nest is active. A nest would be considered active if it contains eggs or fledglings. If the nest does not contain eggs or nestlings and is inactive, it shall be removed promptly. If a nest is determined to be active, the nest shall not be removed and the biologist shall monitor the nest to ensure nesting activities/breeding activities are not disrupted. If the biological monitor determines that project activities are disturbing or disrupting nesting activities, the monitor shall make feasible recommendations to reduce the noise and/or disturbance in the vicinity of the nest.

CEQA Significance Conclusion

A wind development in the TWRA would have a significant impact if it was to violate the Migratory Bird Treaty Act and result in the mortality of migratory birds or to cause destruction or abandonment of migratory bird nests and/or eggs. Violation of the Migratory Bird Treaty Act would be a significant impact that is mitigable to a less-than-significant level (Class II) with implementation of Mitigation Measures TWRA-BIO-1e through TWRA-BIO-1h, TWRA-BIO-2a, TWRA-BIO-2c, TWRA-BIO-7a, and TWRA-BIO-7b.

Impact TWRA-BIO-8: Presence of Transmission Lines May Result in Electrocution of, and/or Collisions by, Listed or Sensitive Bird Species.

Transmission lines would be constructed as part of the wind developments that would be built in the TWRA. Raptors and other large aerial perching birds are susceptible to electrocution, which occurs only when a bird simultaneously contacts two energized phase conductors or an energized conductor and grounded hardware. This happens most frequently when a bird attempts to perch on a transmission tower/pole with insufficient clearance between these elements. Raptor species that utilize the towers for nesting could be electrocuted while landing. Furthermore, nests may be built in areas that are susceptible to electrical charges that may result in fire as well as an electrical outage. Although the majority of raptor electrocutions are caused by lines that are energized at voltage levels between 1 kV and 69 kV, and "the likelihood of electrocutions occurring at voltages greater than 69 kV is extremely low" (APLIC, 2006), wind developments in the TWRA could result in the electrocution of State and/or federally protected bird species. Mitigation Measure TWRA-BIO-8a is suggested to further reduce the risk of electrocution.

Greater than the risk of electrocution is the risk of birds colliding with the transmission towers or lines during foraging or migration, especially in spring migration when strong winds and storms are more likely to force the birds to fly at relatively low altitudes. Mortality as a result of collision with project features would be greatest where the movements of migrating birds are the most concentrated. Bird migration occurs through the TWRA, as evidenced by the number of migrants observed during surveys for other projects in the area. Therefore, transmission lines associated with wind developments may be located in areas utilized as migratory flight corridors.

Most birds migrate at night, so there is no way to know how many birds and what species of birds could actually be impacted by collision with these transmission lines, because much of the migration cannot be seen, and birds that collide with transmission line features and fall to the ground are often taken away by predators/scavengers before morning. Therefore, it is assumed that some migrating species could be federal or State listed or of other special status, and their mortality would be a substantial adverse impact. Also, non-sensitive species or species that migrate during the day could also collide with transmission structures and lines. Mitigation Measure TWRA-BIO-8b would lessen the severity of those impacts.

Mitigation Measures for Impact TWRA-BIO-8:

TWRA-BIO-8a **Construct to 2006 APLIC Guidelines.** The applicant shall conform to the latest practices (as outlined in the 2006 APLIC document) to protect birds from electrocution. Implementation of these guidelines shall be verified by Kern County and BLM (where applicable).

TWRA-BIO-8b **Utilize Collision-Reducing Techniques.** The applicant shall install subtransmission lines utilizing APLIC standards for collision-reducing techniques as outlined in "Mitigating Bird Collisions with Power Lines: The State of the Art in 2006" (APLIC, 2006).

CEQA Significance Conclusion

Risk of electrocution of large birds that utilize transmission structures for perching or nesting would be low, as described above. However, this risk would be further lowered by implementation of Mitigation Measure TWRA-BIO-1a, which requires applicants to construct transmission lines in accordance with 2006 APLIC guidelines. Therefore, with mitigation imposed, this risk is considered adverse but less than significant (Class II).

As described above, it is not known what bird species may collide with the transmission structures and lines that would be constructed as part of wind developments in the TWRA. Therefore, it is assumed that some migrating species could be federal or State listed or of other special status, and their mortality would be a significant impact that is not mitigable to less-than-significant levels (Class I). Also, for non-sensitive species or species that migrate during the day, collision would be significant but would be mitigable to less-than-significant levels (Class II) with implementation of Mitigation Measures TWRA-BIO-8b.

Impact TWRA-BIO-9: Presence of transmission lines would result in increased predation of listed and sensitive wildlife species by ravens that nest on transmission towers.

Common ravens have been documented to prey on the desert tortoise (Liebezeit and George, 2002) that occur in the TWRA. The common raven has not been documented to prey on any other listed or sensitive wildlife in the TWRA (Liebezeit and George, 2002), although the predation may still occur on a limited basis.

The presence of transmission towers associated with development of the TWRA may draw ravens to the area by providing perching and nesting sites (Liebezeit and George, 2002), especially in open areas that lack natural nesting substrates. An increase in raven density would increase predation pressure on juvenile desert tortoises. Mitigation Measures TWRA-BIO-2b and TWRA-BIO-9 is recommended to reduce the threat of ravens to the desert tortoise.

Mitigation Measure for Impact TWRA-BIO-9:

TWRA-BIO-2b **Littering is not allowed.**

TWRA-BIO-9 **Prepare and implement a raven control plan.** A Raven Control Plan shall be prepared and implemented. The Raven Control Plan shall include the use of raven perching/nesting deterrents (such as those manufactured by Prommel Enterprises, Inc. [www.ZENAdesign.com], Mission Environmental [www.missionenviro.co.za], or Kaddas Enterprises, Inc. [www.kaddas.com]) and/or shall describe the procedure for obtaining a permit from the USFWS Law Enforcement Division to legally remove ravens. The plan shall identify the purpose of conducting raven control; provide training in how to identify raven nests and how to determine whether a nest belongs to a raven or a raptor species; describe the seasonal limitations on disturbing nesting raptors; and describe procedures for documenting the activities on an annual basis. The applicant shall obtain approval of this plan from the USFWS prior to the start of construction. The applicant shall work with the USFWS until approval of a plan is obtained.

CEQA Significance Conclusion

Implementation of Mitigation Measures TWRA-BIO-2b and TWRA-BIO-9 would substantially reduce the potential for ravens to be drawn to the TWRA through wind development activities by eliminating litter and preparing and implementing a Raven Control Plan. Ravens prey on juvenile desert tortoises, a State and federally Threatened species. This impact would be significant without mitigation. Therefore, with the implementation of the mitigation measures described above, Impact TWRA-BIO-9 would be less than significant (Class II).

Impact TWRA-BIO-10: Maintenance activities would result in disturbance to wildlife and wildlife mortality.

Maintenance activities, such as the use of access roads or brush clearing around wind development features, could result in disturbance to wildlife and wildlife mortality that would constitute an adverse impact. Vehicle use on access roads could injure or kill wildlife, including sensitive species. Maintenance of wind turbines and substations could result in the release of toxic substances. Additionally, the use of access roads could spread noxious weeds, which would degrade habitat within the wind farm area. Impacts to wildlife through the performance of maintenance activities would be adverse, but would be reduced through implementation of Mitigation Measures TWRA-BIO-1e, TWRA-BIO-1g, TWRA-BIO-1h, TWRA-BIO-1m, TWRA-BIO-2a through TWRA-BIO-2c, and TWRA-BIO-10a through TWRA-BIO-10c.

Mitigation Measures for Impact TWRA-BIO-10:

TWRA-BIO-1e **Construction and survey activities shall be restricted based on final design engineering drawings.**

TWRA-BIO-1g **Comply with all applicable environmental laws and regulations.**

TWRA-BIO-1h **Restrict the construction of access and spur roads.**

TWRA-BIO-1m **No collection of plants or wildlife.**

TWRA-BIO-2a **Identify environmentally sensitive times and locations for tree trimming.**

TWRA-BIO-2b **Littering is not allowed.**

TWRA-BIO-2c **Survey areas for brush clearing.**

TWRA-BIO-10a **Conduct maintenance activities outside the general avian breeding season.** The applicant shall educate all maintenance workers about the sensitivity of biological resources associated with the project and the necessity to avoid unauthorized impacts to them.

In areas not cleared of vegetation in the prior two years, all vegetation clearing, except tree trimming or removal, shall take place between September 16 and February 14 (i.e., outside of the general avian breeding season of February 15 through September 15). Tree trimming or removal shall only take place between September 16 and December 31 (i.e., outside the raptor breeding season of January 1 through September 15).

Other maintenance activities shall occur outside the general avian breeding season where feasible. For other maintenance activities that cannot occur outside the above-listed breeding seasons, a qualified biologist shall work with a qualified acoustician to determine if a maintenance activity would meet or exceed the 60 dB(A) Leq hourly noise threshold where nesting territories of the least Bell's vireo, southwestern willow flycatcher, and burrowing owl occur. If the noise threshold would not be met or exceeded at the edge of their nesting territories, then maintenance may proceed. If the noise threshold would be met or exceeded at the edge of their nesting territories, pre-maintenance surveys for nests of these species shall be conducted by a qualified biologist (USFWS permitted biologist for vireo and flycatcher) within 300 feet of the maintenance area no more than seven days prior to initiation of maintenance that would occur between March 15 and September 15 for the vireo, April 15 and September 15 for the flycatcher, and February 1 and August 31 for the burrowing owl. If active nests are found, work may proceed provided that methods, determined by the qualified acoustician to be effective, are implemented to reduce noise below the threshold. These methods include, but are not limited to, turning off vehicle engines and other equipment whenever possible and/or installing a protective noise barrier between a nesting territory and maintenance activities. If the qualified acoustician determines that no methods would reduce noise to below the threshold, maintenance shall be deferred until the nestlings have fledged as determined the qualified biologist. Where noise-reducing methods are employed, active nests shall be monitored by the qualified biologist on a weekly basis until maintenance is complete or until the nestlings fledge, whichever comes first. The qualified biologist shall be responsible for documenting the results of the pre-maintenance nest surveys and the nest monitoring and for reporting these results to Kern County, BLM (if applicable), and Wildlife Agencies.

Animal Burrows/Dens. If any animal burrows or dens are identified during the pre-maintenance surveys for active bird nests, soil in a brush-clearing area shall be sufficiently dry before brush clearing to prevent damage to burrows or dens. At any time of year where maintenance would occur in occupied MGS habitat, all equipment and vehicles shall remain on existing access roads/staging areas (e.g., they shall not pull off the shoulder) to prevent the crushing of MGS burrows.

TWRA-BIO-10b **Implement Weed Control Measures.** The applicant shall ensure that all vehicles and large equipment utilized on the project have been washed prior to commencing work on the project. This includes wheels, undercarriages, bumpers and all parts of the vehicle. The applicant shall keep a written log documenting that vehicles have been

cleaned prior to use on the project. Once equipment and vehicles have been staged on the job site no further washing would be required unless the vehicles or equipment are exposed to populations of noxious weeds present on the site.

TWRA-BIO-10c **Landscape with Native or Non-invasive Plant Species.** The applicant shall ensure that all landscape plants utilized at the project are not considered invasive by the California Invasive Plant Council (CAL-IPC). Plant species shall be utilized that have a low likelihood of spreading to the adjacent habitats and require minimal watering.

CEQA Significance Conclusion

Impacts to wildlife caused by wind development maintenance activities, as described above, would be significant but mitigable to less-than-significant levels (Class II) with implementation of Mitigation Measures TWRA-BIO-1e, TWRA-BIO-1g, TWRA-BIO-1h, TWRA-BIO-1m, TWRA-BIO-2a through TWRA-BIO-2c, and TWRA-BIO-10a through TWRA-BIO-10c.

Maintenance activities would impact nesting birds (violation of Migratory Bird Treaty Act) if vegetation is cleared during the general avian breeding season (February 15 through September 15) or the raptor breeding season (January 1 through September 15). This impact would be significant but mitigable to less-than-significant levels (Class II) with implementation of Mitigation Measure TWRA-BIO-10a, which requires maintenance activities outside of the breeding season, or, if that is not feasible, monitoring by an approved biologist.

Impact TWRA-BIO-11: Operation of the wind developments would lead to avian mortality from collision with turbines.

Operation of the wind component is expected to result in mortality of birds due to collision with wind turbines. Recent studies have shown that taller tower heights are likely to reduce raptor mortality due to an increase in ground-to-rotor clearance, especially for red-tailed hawks, golden eagles and American kestrels that utilize spaces closer to the ground for hunting prey. For example, golden eagles have often been observed hunting within three meters of the ground. Also, raptor use has been shown in general to be higher on the prevailing upwind side of ridges, and turbines sited away from the rim edge may contribute to lower raptor fatality rates. Ground disturbance around wind turbines (roads and work pads) increases the vertical/horizontal edge near turbines, which also may increase prey densities and raptor use. Also, ground disturbance that creates rock piles creates habitat for small mammals and reptiles which could then attract raptors to the turbine sites. Small mammals and reptiles may also be likely to burrow near the turbine bases where soil has been disturbed. Rodent control programs have been used in the past at wind project sites; however, recent studies suggest moderate levels (intermittent) of rodent control may increase raptor fatalities, and secondary impacts to terrestrial wildlife from rodent control are a concern. Associated facilities at wind projects include permanent meteorological towers. Studies have shown that guyed meteorological towers may kill more passerines per structure than wind turbines (Contra Costa, 2007).

The TWRA lies within the Pacific Flyway, one of four major avian migratory pathways in North America. Many species, particularly passerines, are expected to move through the TWRA during spring and winter migrations. Wind turbines are expected to pose a particular threat to migratory birds that fly at night or under conditions of low visibility (Kuntz et al., 2007). In addition to collision with turbines, transmission towers, guyed meteorological towers, and other appurtenant structures pose a collision risk to birds and bats (Drewitt and Langston, 2006).

The features of a wind farm, including siting of turbines, topography, and the use of lighting, can increase risk to birds and bats at a particular location. Lighting can attract and disorient birds, increasing the risk of collision (Drewitt and Langston, 2006). Injury and mortality of migratory and resident birds would be substantial and adverse. Mitigation Measures TWRA-BIO-11a through TWRA-BIO-11C are recommended to reduce avian mortality from the operation of wind developments.

Mitigation Measure for Impact TWRA-BIO-11:

TWRA-BIO-11a **Implement measures to reduce avian and bat impacts from turbine activities:** This mitigation measure includes the following:

- Increase ground to rotor clearance. Turbine tower heights shall be at least 55 meters at sites where the FAA will allow that height.
- Wherever feasible, turbines shall not be sited on or immediately adjacent to the upwind sides of ridge crests.
- Turbine construction shall minimize cutting into hill slopes in an attempt to achieve smooth rounded terrain, rather than sudden berms or cuts, to reduce prey abundance.
- Rocks unearthed during the excavation process shall be used during construction of foundations or hauled off site and disposed of properly, and not be left in piles near turbines.
- Discourage small mammals and reptiles from burrowing under or near turbine bases by placing gravel at least 5 feet around each tower foundation.
- The wind component developer shall not participate in rodent control programs on leased lands and will discourage landowners from using poisoning for rodent control in the vicinity of the project.
- Only un-guyed meteorological towers shall be constructed for the wind project.
- Prior to obtaining a grading or building permit, the project applicant shall submit a final site plan for review and approval by the County Zoning Administrator and BLM (where applicable) demonstrating compliance with the standards described in this document.
- The applicant shall coordinate with the FAA to minimize lighting to the extent feasible by using minimal-intensity, directional, low-sodium lights on appurtenant structures.
- The applicant shall coordinate with the FAA to minimize the number of wind turbines that require night lighting, and use low-frequency red strobe lights, as allowed.

TWRA-BIO-11b **Implement a construction Avian/Bat Mortality Monitoring program:** A scientifically defensible monitoring program shall be implemented to estimate the avian and bat fatality rates from the new turbines and important covariates such as prey base and avian use. The program shall be implemented in the first three years following the initial operation of the project to demonstrate to Kern County and BLM (if applicable) that migration is compatible with operation of wind turbines and that the level of incidental injury and mortality does not result in an unanticipated long-term decline in migratory raptor species in the vicinity of the project site. Post-construction Avian/Bat Mortality Monitoring shall include a Mortality Analysis, which shall be conducted as follows:

a. The applicant shall provide Kern County and BLM (where applicable) with the results of a mortality study for migratory raptors and bats on an annual basis. A qualified wildlife biologist shall conduct mortality monitoring using a statistically significant sample size of operational turbine sites within the wind energy development project.

b. The Mortality Analysis shall note species, location, and distance from the turbine for each recovered bird and bat, availability of raptor and bat prey species, and apparent cause of avian or bat mortality. The applicant shall provide all results to the Wildlife Response and Reporting System database within 90 days of completion of the annual study.

c. The mortality monitoring shall follow standardized guidelines outlined by the National Wind Coordinating Committee, and shall include carcass scavenging and searcher efficiency trials.

d. The results of the Mortality Analysis shall be provided to Kern County, BLM (where applicable), and regional entities involved in the conservation of migratory species, including the USFWS, the CDFG, and the Audubon Society. At a minimum, the Mortality Analysis shall consider three factors:

   i. Number of annual avian and bat mortalities per turbine,

   ii. Disproportionate representation of a particular species, and

   iii. Comparison to existing data on wind farm mortality.

TWRA-BIO-11C **Conduct post-construction breeding monitoring**. The applicant or its representative shall conduct Post-Construction Breeding Monitoring in the first three years following the initial operation of the project to demonstrate to Kern County and BLM (where applicable) that sensitive resident birds are compatible with operation of wind turbines, and that the level of incidental injury and mortality does not result in a long-term decline in sensitive resident bird species in the region. Post-construction Breeding Monitoring shall include a Nesting Analysis and a Wintering Analysis that shall be conducted as follows:

a. Nesting Analysis:

   i. The applicant shall provide Kern County and BLM (where applicable) the results of a study and comparative data analysis, using methods approved by the County and BLM (where applicable). Qualified ornithologists shall conduct the study of nesting raptors.

   ii. Nesting raptor surveys shall be conducted throughout the project site between February 15 and August 15.

   iii. Directed field surveys for nesting raptors shall be conducted during the breeding season by vehicle and on foot to determine the presence or absence of raptor nests, especially mid-sized to large raptor nests within suitable habitat areas.

   iv. If at the end of the second year of monitoring, the operation of wind turbines has been determined to result in a level of incidental injury and mortality to nesting birds that constitutes a significant adverse impact on a breeding population, the applicant shall undertake supplemental compensatory measures to support regional conservation of migratory birds.

The results of the Nesting Analysis shall be made available to regional entities involved in research related to the conservation of nesting birds such as the Audubon Society.

b. Wintering Analysis:

   i. Qualified ornithologists shall conduct a wintering raptors study showing the presence/absence of winter raptors at the project site using either telemetry or counts from late November to early February in the three years following initiation of operation of the wind energy development project.

ii. The applicant shall provide the Kern County Planning Department with the results of the study and comparative data analysis using approved methods for wintering raptors.

If after two years of Post-construction Breeding Monitoring, the Kern County Planning Department, in consultation with the CDFG and the USFWS, determines that the project is resulting in unanticipated significant adverse impacts to the population of a breeding species, the applicant shall provide supplemental mitigation. Supplemental measures to be considered could include:

- Provision of additional nesting structure or platforms.
- Contribution to research that addresses the sources of mortality and population impacts on the species of concern.
- Funding of regional conservation measures with the intention of enhancing and preserving existing breeding habitat.

CEQA Significance Conclusion

Avian mortality due to collisions with wind turbines and associated wind development structures would be significant and not mitigable to less than significant levels (Class I). Implementation of Mitigation Measure TWRA-BIO-11a through TWRA-BIO-11c are required to, at least in part, compensate for impacts to birds from collision with turbines and other wind development structures.

Impact TWRA-BIO-12: Operation of the wind component would lead to bat mortality from collision with turbines.

Operation of the wind component is expected to result in some bat mortality from collision with wind turbines. Studies show that bat mortality from collision with wind turbines is highest during the late summer and fall migration season. Based on other studies in the west, some mortality of mostly migratory bats, especially hoary and Mexican free-tailed bats, is anticipated. Projected mortality levels are unknown and could be higher or lower based on such factors as regional migratory patterns, patterns of local movements through the project area, and the response of bats to turbines — both individually and collectively (Contra Costa, 2007). Mitigation Measures TWRA-BIO-11a through TWRA-BIO-11C are recommended to reduce bat mortality from the operation of wind developments.

Mitigation Measures for Impact TWRA-BIO-12:

TWRA-BIO-11a Implement measures to reduce avian and bat impacts from turbine activities.

TWRA-BIO-11b Implement a construction Avian/Bat Mortality Monitoring program.

TWRA-BIO-11C Conduct post-construction breeding monitoring.

CEQA Significance Conclusion

Bat mortality would be significant and not mitigable to less than significant levels (Class I). Implementation of Mitigation Measures TWRA-BIO-11a through TWRA-BIO-11c are required to, at least in part, compensate for impacts to bats from collision with turbines and other appurtenant structures.

Riparian Habitat and Other Sensitive Natural Communities (Criterion TWRA BIO2)

Projects associated with development of the TWRA would result in an impact to Biological Resources under Criterion TWRA BIO2 if associated construction, maintenance, operation, or decommissioning

activities would result in impacts to riparian habitat or other sensitive natural communities as identified in local or regional plans, policies, regulations, or by the CDFG or USFWS.

Impact TWRA-BIO-13: Construction activities would result in temporary or permanent loss of native vegetation communities.

Vegetation Communities. As described in Section 1.4 (Construction), construction of a typical wind energy project would include the following activities: grading of roads, turbine pads, and crane pads; grading of substation, O&M building, switching station, materials laydown, and equipment staging areas; and construction of the turbine tower foundations and transformer pads. Excavation would be required for each turbine foundation and, depending upon soil and geotechnical conditions at each turbine site, some blasting may be required for turbine tower foundations and interconnecting trenches. All of these construction activities would result in temporary and/or permanent losses of native vegetation. Although the degree of vegetation loss would differ between wind development projects, all projects would contribute to this impact. The magnitude of these losses cannot be estimated at this time due to lack of project-specific information regarding the buildout of the TWRA.

Vegetation Management (Loss of Trees). No estimates are available as to how many trees or shrubs would be removed or trimmed as part of vegetation management for projects within the TWRA. However, there are native woodland and riparian communities present in the project area that support trees and shrubs that would likely require either removal or trimming. The loss or trimming of non-native trees or shrubs would usually be a relatively minor impact because they are non-native and they typically do not support special-status wildlife species. However, removal or trimming of a non-native tree or shrub that contains an active bird nest would be a violation of the Migratory Bird Treaty Act. Likewise, removal or trimming of a native tree or shrub that contains an active bird nest would also be a violation of the Migratory Bird Treaty Act. Additionally, trimming up to 30 percent of a native tree's crown would diminish the tree's value as wildlife habitat and could cause harm to the tree, leading to its decline or death.

Type Conversion. As discussed in Section 6.9 (Hazards), construction activities and the operation of new transmission lines in areas with high fire risk could cause wildfires, and could reduce the effectiveness of fire fighting efforts. Fires cause direct loss of vegetation communities, wildlife habitat, and wildlife species. Although periodic fires are part of the natural ecosystem, fires burning too frequently can have significant long-term ecological effects such as degradation of habitat (temporal loss of habitat and non-native plant species invasion) and loss of special status species. Fires have become more frequent with growth in the human population, creating a situation in which vegetation communities (and, therefore, habitats for plant and animal species) are changed dramatically and may not recover. This change in vegetation community is called "type conversion" and can occur to any native vegetation community. When burned too frequently, vegetation communities are often taken over by highly flammable, weedy, non-native plant species that burn even more often and provide minimal habitat value for native plant and animal species, especially those of special status.

Mitigation Measures TWRA –BIO-1a through TWRA-BIO-1i are recommended to reduce impacts to native vegetation, trees that could support nesting birds, and to prevent type conversion.

Mitigation Measures for Impact TWRA-BIO-13

TWRA-BIO-1a **Provide restoration/compensation for affected sensitive vegetation communities.**

TWRA-BIO-1b **Conduct biological monitoring.**

TWRA-BIO-1c **Perform protocol surveys.**

TWRA-BIO-1d **Train project personnel.**

TWRA-BIO-1e **Construction and survey activities shall be restricted based on final design engineering drawings.**

TWRA-BIO-1f **Build access roads at right angles to streambeds and washes.**

TWRA-BIO-1g **Comply with all applicable environmental laws and regulations.**

TWRA-BIO-1h **Restrict the construction of access and spur roads.**

TWRA-BIO-1i **Protect and restore vegetation.**

CEQA Significance Conclusion

Implementation of Mitigation Measures TWRA-BIO-1a through TWRA-BIO-1i would reduce the severity of impacts to native vegetation communities, but not to a level below significance. These measures would require restoration of any temporarily affected areas, biological monitoring, protocol surveys, training for project personnel, limits to construction and survey activities, minimization of impacts to riparian features, compliance with all applicable laws and regulations, minimization of access and spur roads, and the protection of vegetation. However, because of the extremely long time frame required for establishment of many sensitive desert plant communities, temporary impacts in many cases would be considered permanent if restoration goals cannot be achieved within a reasonable time frame (for example, five years). Therefore, Impact TWRA-BIO-13 would be significant and unavoidable (Class I). Impacts to non-sensitive vegetation communities would be adverse but less than significant due to their regional abundance and the relatively small areas of impact (Class III).

The loss and trimming of native trees are considered significant impacts that would not be mitigable to less than significant levels (Class I) because adequate mitigation land required by Mitigation Measure TWRA-BIO-1a for restoration and/or acquisition may not be available. However, Mitigation Measure TWRA-BIO-1a is required to reduce the impacts to the greatest extent possible.

If the project were to cause a fire, or inhibit fighting of fires, and this leads to type conversion of sensitive vegetation communities, the impact would be significant and no mitigation exists that would reduce this impact to a less-than-significant level. Mitigation for fire risk is presented in Section 6.10. However, not all fires can be prevented. Although future fires may not cause type conversion in all instances, the impact must be considered significant because of the severity of potential habitat loss. This impact is not mitigable to a less-than-significant level (Class I).

Impact TWRA-BIO-14: Construction and operation/maintenance activities would result in the introduction of invasive, non-native, or noxious plant species.

The wind component would have a substantial adverse effect on riparian or other sensitive vegetation communities if weed species are introduced during construction or operation/maintenance activities.

Southeastern Kern County and the TWRA have been subject to the expansion of exotic plant species for decades, usually in conjunction with grazing and other vegetation-disturbing activities. The introduction of non-native plant species is a special concern for native plant communities and has become a common occurrence in ecosystems around the globe (Weber, 2003). Non-native plants pose a threat to the natural processes of plant community succession, fire frequency, biological diversity and species composition. The survival of some populations of special-status species could be adversely affected by the success of an introduced plant species. In areas subject to wildfires, which have recently occurred in portions of the TWRA, exotic plants can quickly out-compete natives and change the ecology of the system.

Non-native vegetation, including noxious and invasive weeds, is a common occurrence in many sections of the TWRA. This is particularly evident along the margins of major roads and highways and the urban-rural interface where thistles, mustard, and exotic grasses are common. These areas are typically subject to higher levels of disturbance from routine road grading, parking, OHV use, and grazing, which provide ideal conditions for the spread of invasive plant species. Other large areas of non-native grassland cross the TWRA in multiple locations, especially in areas that once supported agriculture. As development of the TWRA would temporarily and permanently remove habitat at each turbine and tower location, there is a potential for the introduction or spread of non-native plant species. This impact would be closely associated with the construction of wind developments within the TWRA, but would also continue to occur during the operation and maintenance phases of the wind developments. The introduction of non-native or noxious weeds would be related to the use of vehicles, construction equipment, or earth materials contaminated with non-native plant seed, use of straw bales or wattles that contain seeds of non-native plant species, or the spread of invasive plants from one section of a project area to another.

Mitigation Measures for Impact TWRA-BIO-14:

TWRA-BIO-1a **Provide restoration/compensation for affected sensitive vegetation communities.**

TWRA-BIO-1i **Protect and restore vegetation.**

TWRA-BIO-10b **Implement weed control measures.**

TWRA-BIO-10c **Landscape with native or non-invasive plant species.**

CEQA Significance Conclusion

Although the region currently supports wide populations of noxious weeds, the introduction of new species not currently present in the region or the spread of noxious plant species across the TWRA would be considered a significant impact absent mitigation. The introduction and spread of non-native plant species normally occurs when vehicles or equipment exposed to populations of noxious weeds in one geographic area inadvertently transport the seeds to another area where lands have been disturbed. Implementation of Mitigation Measures TWRA-BIO-1a, TWRA-BIO-1i, TWRA-BIO-10b, and TWRA-BIO-10c would reduce potential impacts from the introduction of non-native plant species to a less-than-significant level (Class II).

Impact TWRA-BIO-15: Construction activities would create dust that would result in degradation of vegetation.

Construction activities such as grading, excavation, and driving of heavy equipment on unpaved roadways would result in increased levels of blowing dust that may settle on surrounding vegetation. Increased levels of dust on plants can significantly impact plants' photosynthetic capabilities and degrade the overall

vegetation community. This would constitute a substantial impact but would be mitigable with implementation of Mitigation Measure TWRA-BIO-1h that includes regular watering to control fugitive dust and a 15 mile-per-hour speed limit on dirt access roads to reduce dust.

Mitigation Measure for Impact TWRA-BIO-15:

TWRA-BIO-1h Restrict the construction of access and spur roads.

CEQA Significance Conclusion

This would be a significant impact absent mitigation. Implementation of Mitigation Measure TWRA-BIO-1h, that includes regular watering to control fugitive dust and a 15 mile-per-hour speed limit on dirt access roads to reduce dust, would reduce Impact TWRA-BIO-15 to a less-than-significant level (Class II).

Federally Protected Wetlands (Criterion TWRA BIO3)

Projects associated with development of the TWRA would result in an impact to Biological Resources under Criterion TWRA BIO3 if associated construction, maintenance, operation, or decommissioning activities would result in adverse impacts to federally protected wetlands as defined by Section 404 of the Clean Water Act. Federally protected wetlands could include marsh, vernal pool, coastal, or other habitats.

Impact TWRA-BIO-16: Construction activities would result in adverse effects to jurisdictional waters and wetlands through vegetation removal, placement of fill, erosion, sedimentation, and degradation of water quality.

Construction activities associated with the buildout of the TWRA could result in adverse effects to jurisdictional waters during grading and vegetation removal (which could cause erosion, sedimentation, and/or degradation of water quality) required for construction of wind turbine pads, access roads, excavation of trenches, and other associated facilities. It is currently unknown where and if jurisdictional waters occur relative to future wind development projects in the TWRA. Therefore, the potential exists for project activities to impact jurisdictional waters and wetlands. Mitigation Measures TWRA-BIO-1b, TWRA-BIO-1f, and TWRA-BIO-16 are recommended to reduce impacts to jurisdictional waters and wetlands.

Mitigation Measures for Impact TWRA-BIO-16:

TWRA-BIO-1b Conduct biological monitoring.

TWRA-BIO-1f Build access roads at right angles to streambeds and washes.

TWRA-BIO-16 Provide restoration/compensation for affected jurisdictional areas. Impacts to areas under the jurisdiction of the ACOE, RWQCB, and CDFG shall be avoided to the extent feasible. Where avoidance of jurisdictional areas is not feasible (including for emergency repairs), the applicant shall provide the necessary mitigation required as part of wetland permitting by creation/restoration/ preservation of suitable jurisdictional habitat along with adequate buffers to protect the function and values of jurisdictional area mitigation. The location(s) of the mitigation would be determined in consultation with Kern County, BLM (where applicable), Wildlife Agencies, ACOE, RWQCB, and CDFG, as part of the wetland permitting process. It is anticipated that the mitigation sites would be in close proximity to the impacts or in the same watershed. A jurisdictional

delineation and impact assessment shall be prepared based on the final alignment and final engineering plans when they are complete. Mitigation ratios would range from 1:1 up to 4:1 and would depend on the sensitivity of the jurisdictional habitat and on the requirements of the wetland permitting agencies. The width of wetland buffers would also depend on the sensitivity of the jurisdictional habitat and on the requirements of the wetland permitting agencies. It is anticipated that at least a 1:1 ratio of the mitigation would include creation of jurisdictional habitat so there would be no net loss of jurisdictional habitat. For example, permanent impacts to emergent wetland would require a 2:1 mitigation ratio. Half (or 1:1) of the mitigation acreage would have to consist of created emergent wetland in an appropriate location to be preserved, and the other half (1:1) would require acquisition and preservation of already-existing emergent wetland (or other wetland community acceptable to the permitting agencies — ACOE, RWQCB, and CDFG). It is also anticipated that a 1:1 ratio would be required for impacts to jurisdictional non-wetland Waters of the U.S. in the form of wetland enhancement, restoration, or creation as determined in consultation with the permitting agencies. Wetland permits shall be obtained from the ACOE, RWQCB, and CDFG prior to initiating construction in jurisdictional areas.

All limits of construction shall be delineated with orange construction fencing. All stakes, flagging, or fencing shall be removed no later than 30 days after construction is complete. During and after construction, entrances to access roads shall be gated to prevent the unauthorized use of these roads by the general public. Signs prohibiting unauthorized use of the access roads shall be posted on these gates.

Any impacts associated with unauthorized activity (e.g., exceeding approved construction footprints) shall be mitigated at a 5:1 ratio as follows, unless otherwise directed by the ACOE, RWQCB, and CDFG: restoration of the unauthorized impacts shall be credited at a 1:1 ratio; the remaining 4:1 shall be acquired off site.

The applicant shall identify a qualified Habitat Restoration Specialist to be approved by Kern County, BLM (where applicable), ACOE, RWQCB, and CDFG. The Habitat Restoration Specialist shall prepare and implement a Wetland Mitigation Plan to be approved in writing by Kern County, BLM (where applicable), ACOE, RWQCB, and CDFG. The applicant shall work with the above-listed agencies until a plan is approved by all. The mitigation of habitat shall be maintained and monitored for five years after installation, or until established success criteria (specified percent cover of native and non-native species, species diversity, and species composition as compared with an undisturbed reference site) are met, to assess progress and identify potential problems with the mitigation. Remedial action (e.g., additional planting, weeding, erosion control, use of container stock, supplemental watering, etc.) shall be taken during the maintenance and monitoring period if necessary to ensure the success of the mitigation. If the mitigation fails to meet the established performance criteria after the five-year maintenance and monitoring period, maintenance and monitoring shall extend beyond the five-year period until the criteria are met or unless otherwise approved by Kern County, BLM (where applicable), ACOE, RWQCB, and CDFG.

A Habitat Management Plan shall be prepared by a biologist approved by Kern County, BLM (where applicable), and CDFG for all acquired off-site mitigation parcels. The Habitat Management Plan must be approved in writing by Kern

County, BLM (where applicable), and CDFG prior to the initiation of any activities which may impact jurisdictional areas. The applicant shall work with Kern County, BLM (where applicable), and CDFG until a plan is approved by all. The Habitat Management Plan shall provide direction for the preservation and in-perpetuity management of all acquired, off-site mitigation parcels. The Habitat Management Plan shall include, but shall not be limited to:

- Legal descriptions of all mitigation parcels approved by Kern County, BLM (where applicable), ACOE, RWQCB, and CDFG
- Baseline biological data for all mitigation parcels
- Designation of a land management entity approved by the Kern County, BLM (where applicable), ACOE, RWQCB, and CDFG to provide in-perpetuity management
- A Property Analysis Record prepared by the designated land management entity that explains the amount of funding required to implement the Habitat Management Plan
- Designation of responsible parties and their roles (e.g., provision of endowment by the applicant to fund the Habitat Management Plan and implementation of the Habitat Management Plan by the designated land management entity)

Management specifications including, but not limited to, regular biological surveys to compare with baseline; exotic, non-native species control; fence/sign replacement or repair, public education; trash removal; and annual reports to Kern County, BLM (where applicable), ACOE, RWQCB, and CDFG.

CEQA Significance Conclusion

Impacts to jurisdictional waters or wetlands, if present, could be adverse due to the removal of vegetation and grading. These impacts would be significant but mitigable to a less-than-significant level (Class II) with implementation of Mitigation Measures TWRA-BIO-1b, TWRA-BIO-1f, and TWRA-BIO-16.

Interference with the Fish or Wildlife Movement, Migration Corridors, or the Use of Native Wildlife Nursery Sites (Criterion TWRA BIO4)

Projects associated with development of the TWRA would result in an impact to Biological Resources under Criterion TWRA BIO4 if associated construction, maintenance, operation, or decommissioning activities would interfere substantially with the movement of any native migratory fish or wildlife species, or with established native resident or migratory corridors, or impede the use of native wildlife nursery sites.

Impact TWRA-BIO-17: Adverse Effects to Linkages or Wildlife Movement Corridors, the Movement of Fish, and/or Native Wildlife Nursery Sites.

Linkages and corridors facilitate regional animal movement and are generally centered around waterways, riparian corridors, flood control channels, contiguous habitat, and upland habitat. Drainages generally serve as movement corridors because wildlife can move easily through these areas, and fresh water is available. Corridors also offer wildlife unobstructed terrain for foraging and for dispersal of young individuals. Ridgelines that occur throughout the TWRA may also serve as movement corridors.

As the movements of wildlife species are more intensively studied using radio-tracking devices, there is mounting evidence that some wildlife species do not necessarily restrict their movements to some obvious landscape element, such as a riparian corridor. For example, recent radio-tracking and tagging studies of Coast Range newts, California red-legged frogs, southwestern pond turtles, and two-striped garter snakes

found that long-distance dispersal involved radial or perpendicular movements away from a water source with little regard to the orientation of the assumed riparian "movement corridor." Likewise, carnivores do not necessarily use riparian corridors as movement corridors, frequently moving overland in a straight line between two points when traversing large distances. In general the following corridor functions can be utilized when evaluating impacts to wildlife movement corridors:

- **Movement corridors** are physical connections that allow wildlife to move between patches of suitable habitat. Simberloff et al. (1992) and Beier and Loe (1992) correctly state that, for most species, we do not know what corridor traits (length, width, adjacent land use, etc.) are required for a corridor to be useful. But, as Beier and Loe (1992) also note, the critical features of a movement corridor may not be its physical traits but rather how well a particular piece of land fulfills several functions, including allowing dispersal, plant propagation, genetic interchange, and recolonization following local extirpation.
- **Dispersal corridors** are relatively narrow, linear landscape features embedded in a dissimilar matrix that links two or more areas of suitable habitat that would otherwise be fragmented and isolated from one another by rugged terrain, changes in vegetation, or human-altered environments. Corridors of habitat are essential to the local and regional population dynamics of a species because they provide physical links for genetic exchange and allow animals to access alternative territories as dictated by fluctuating population densities.
- **Habitat linkages** are broader connections between two or more habitat areas. This term is commonly used as a synonym for a wildlife corridor (Meffe and Carroll, 1997). Habitat linkages may themselves serve as source areas for food, water, and cover, particularly for small- and medium-size animals.
- **Travel routes** are usually landscape features, such as ridgelines, drainages, canyons, or riparian corridors within larger natural habitat areas that are used frequently by animals to facilitate movement and provide access to water, food, cover, den sites, or other necessary resources. A travel route is generally preferred by a species because it provides the least amount of topographic resistance in moving from one area to another yet still provides adequate food, water, or cover (Meffe and Carroll, 1997).
- **Wildlife crossings** are small, narrow areas of limited extent that allow wildlife to bypass an obstacle or barrier. Crossings typically are manmade and include culverts, underpasses, drainage pipes, bridges, and tunnels to provide access past roads, highways, pipelines, or other physical obstacles. Wildlife crossings often represent "choke points" along a movement corridor because useable habitat is physically constricted at the crossing by human-induced changes to the surrounding areas (Meffe and Carroll, 1997).

The development of the wind facilities occurs primarily on ridgelines that do not contain drainages that carry perennial flows. These ridgelines themselves may serve as travel routes for wildlife. However, wildlife movement is often concentrated more in canyons and drainages, so construction of the wind facilities would adversely affect some wildlife movement because of the size of the wind facilities impact areas, but not to a substantial degree. Drainages are present in several locations throughout the TWRA, and access roads may cross through these areas. As described above, drainages are known locations utilized by many wildlife species as movement corridors. Mitigation Measures TWRA-BIO-1f, TWRA-BIO-1h, TWRA-BIO-1j, and TWRA-BIO-2e would reduce impacts associated with wildlife movement by minimizing impacts in areas typically utilized as movement corridors, avoidance of sensitive features, and reduction of features that would draw wildlife to the wind development areas, such as night lighting and access roads.

During project operation, the widely spaced towers and turbines would not physically obstruct wildlife movement; wildlife could move under and around the towers and around the turbines. Additionally, the creation of permanent access roads may, in some cases, make wildlife movement through otherwise dense vegetation easier. However, Kern County requires fencing a minimum of four feet in height around each turbine or the perimeter of a development. This fencing would interfere with wildlife movement patterns around and through wind developments, especially as it relates to the numerous desert washes that crisscross the area and likely serve as movement corridors for wildlife moving between the foothills and

the valleys, and through the valleys. Mitigation Measure TWRA-BIO-17 would require fencing of individual turbines rather than entire projects where feasible, which would reduce impacts to wildlife movement.

Bat nursery colonies would be adversely impacted by a wind development project if humans approach an active nursery colony, if entrances to nursery colony sites become blocked, if construction involves blasting or drilling that causes substantial vibration of the earth/rock surrounding an active nursery colony, or if a structure such as a bridge is disturbed by construction. These colonies could be located in rock crevices, caves, or culverts; inside/under bridges; in other man-made structures; and in trees (typically snags or large trees with cavities). A bat nursery colony site is where pregnant female bats assemble (or one bat if it's of a solitary species) to give birth and raise their pups. Mitigation Measure TWRA-BIO-3, which requires surveys for bat nursery colonies, would substantially reduce disturbance to bat nursery colonies in the project areas.

Mitigation Measures for Impact TWRA-BIO-17:

TWRA-BIO-1f **Build access roads at right angles to streambeds and washes.**

TWRA-BIO-1h **Restrict the construction of access and spur roads.**

TWRA-BIO-1j **Avoid sensitive features.**

TWRA-BIO-2e **Reduce construction night lighting on sensitive habitats.**

TWRA-BIO-3 **Survey for bat nursery colonies.**

TWRA-BIO-17 **Fence individual turbines.** Where feasible, individual turbines shall be fenced, rather than entire projects, to facilitate wildlife movement. Fencing shall conform to the requirements of the Kern County Wind Energy Combining District Ordinance 19.64.140.

CEQA Significance Conclusion

Impacts to wildlife movement through wind developments would be significant, but implementation of mitigation measures TWRA-BIO-1f, TWRA-BIO-1h, TWRA-BIO-1j, TWRA-BIO-2e, and TWRA-BIO-17 would reduce these impacts to a less-than-significant level. The impacts to bat nursery colonies would be significant but mitigable to less-than-significant levels (Class II) with implementation of Mitigation Measure TWRA-BIO-3.

Conflicts with Local Policies or Ordinances Protecting Biological Resources (Criterion TWRA BIO5)

Projects associated with development of the TWRA would result in an impact to Biological Resources under Criterion TWRA BIO5 if associated construction, maintenance, operation, or decommissioning activities would conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

Impact TWRA-BIO-18: Wind development would conflict with local policies or ordinances protecting biological resources.

Kern County has an oak tree preservation policy discussed in its General Plan. Buildout of the TWRA would likely result in impacts to oak trees. It is unknown the extent or location of activities that could impact oak trees at this point, and environmental analysis conducted for each project would have to quantify impacts to oak trees. However, Mitigation Measure TWRA-BIO-1a, which provides mitigation

ratios for native trees, including oak trees, would reduce impacts to oak trees related to the buildout of the TWRA.

Mitigation Measures for Impact TWRA-BIO-18:

TWRA-BIO-1a Provide restoration/compensation for affected sensitive vegetation communities.

CEQA Significance Conclusion

Implementation of Mitigation Measure TWRA-BIO-1a would reduce the impacts to native trees, including oak trees and provides a mitigation strategy for any unavoidable impacts to oaks and other native trees. By implementing Mitigation Measure TWRA-BIO-1a, impacts to oak trees, which would provide a conflict with Kern County General Plan, would be less than significant (Class II).

Conflicts with Adopted Habitat Conservation Plans, Natural Community Conservation Plans, or Other Approved Habitat Conservation Plans (Criterion TWRA BIO6)

Projects associated with development of the TWRA would result in an impact to Biological Resources under Criterion TWRA BIO6 if associated construction, maintenance, operation, or decommissioning activities would conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan.

The West Mojave Plan (WMP) is "a habitat conservation plan and federal land use plan amendment that (1) presents a comprehensive strategy to conserve and protect the desert tortoise, the Mohave ground squirrel (MGS) and nearly 100 other sensitive plants and animals and the natural communities of which they are part, and (2) provides a streamlined program for complying with the requirements of the California and federal Endangered Species Acts" (BLM, 2005a). The 9,359,070-acre planning area includes 3,263,874 acres of Bureau of Land Management (BLM) administered public lands; 3,029,230 acres of private lands; and 102,168 acres of lands administered by the State of California within portions of Inyo, Kern, Los Angeles, and San Bernardino counties.

The BLM issued a Record of Decision (ROD) based on the WMP Environmental Impact Report (EIR). However, the ROD addressed only BLM's amendment of the California Desert Conservation Area (CDCA) Plan, and it did not include actions proposed by State and local governments for non-federal lands, except when specifically identified (BLM, 2006). The habitat conservation plan portion of the WMP has not been completed and would require greater specificity for local governments to obtain incidental take permits under the State and Federal endangered species acts (BLM, 2006). However, it is likely to be approved before much of the development of the TWRA occurs, thus this development would be subject to the provisions of the WMP. As the specific provisions of the WMP that will be adopted are unknown at this time, and project-specific information is also unknown, it is impossible to determine whether future wind development projects will conflict with the WMP. However, it is assumed that projects would be required to comply with the WMP as a condition of their approval.

It should be noted that three Areas of Critical Environmental Concern (ACECs) occur under the WMP in the TWRA. These areas would be off-limits to new wind developments. The largest ACEC within the boundaries of the TWRA occurs at the narrow point between the northern and southern portions. Another small ACEC occurs just southwest of this point, and the third occurs at the eastern boundary of the northern portion of the TWRA (see Figure 6.2-2). These ACECs are managed to protect sensitive resources and activities within these areas are strictly limited.

CEQA Significance Conclusion

Because the habitat conservation plan portion of the WMP has not yet been adopted, and because projects are assumed to be required to comply with the WMP once it is adopted, there is no impact under Criterion TWRA BIO6.

6.8 Cultural and Paleontological Resources

This section addresses the potential Cultural and Paleontological Resources impacts of expected and potential wind development in the TWRA. A description of the Affected Environment for Cultural and Paleontological Resources is presented below in Section 6.8.1, followed by a description of Applicable Laws, Regulations, and Standards in Section 6.8.2, and the Impact Analysis presented in Section 6.8.3.

6.8.1 Affected Environment

The TWRA contains a rich array of prehistoric and historical cultural resources and paleontological sites. This section provides contextual background information on the cultural and paleontological resources in the study area, including the area's prehistoric, ethnographic, and historical settings. This section also summarizes the results of a records search of known archaeological, architectural and paleontological resources in the TWRA and assesses the cultural resource and paleontological sensitivity.

6.8.1.1 Cultural Setting

Prehistory

The proposed project area is located at the transition between the Tehachapi Mountains and the western Mojave Desert—both areas contain a record of substantial depth and variety for human occupation. The earliest archaeological evidence of cultural activity occurs during the terminal Pleistocene, a period marked by rising temperature and precipitation and unstable climate. Although evidence of a Paleoindian occupation (prior to 10,000 B.P) in the region is sparse, marked by a single Clovis point recovered from the foothills of the Tehachapi Mountains (Glennan, 1971b), the valley was likely an ideal place for the exploitation of late Pleistocene megafauna. Archaeologists hypothesize that the earliest occupants of the region led a foraging lifestyle focused around lakeshore or wetland environments (Davis, 1978; Moratto, 1984). Population density was presumably quite low. The toolkit included large lanceolate and fluted points (e.g., Clovis or Folsom) for hunting game, as well as crescents, gravers, scrapers, choppers, perforators, and numerous small formalized and informal flake tools (Davis, 1978). Ground stone implements were rare, indicating that processed seeds or nuts did not play a significant dietary role. As the Holocene era progressed and the climate moderated, humans occupied increasingly higher elevation zones in the Coast Ranges, Tehachapis, and Sierra Nevada. Archaeological research over the last century has established a cultural history for the prehistoric peoples of the region.

Lake Mojave Period (10,000–7000 B.P.). The Lake Mojave Period is marked by a drier climate than the preceding period, with intermittent moist episodes. Several sites dating to this period have been found within the southwestern Great Basin and the northern Mojave Desert, suggesting a considerable population increase during this time. Lake Mojave artifacts include large percussion-flaked foliate and stemmed points and knives (typically Lake Mojave and Silver Lake types), stone crescents, and a wide variety of scrapers, gravers, and perforating tools. Ground stone implements continue to be rare. Sutton (1988:30) noted that much of Antelope and Fremont valleys to the southeast may have been covered by Pleistocene Lake Thompson. Because the relief in the valley is slight, extensive marshlands may have

ringed the lake. Such marshes are among the most productive of habitats, and Davis (1978) argued that these wetlands would have attracted early occupants. A similar phenomenon occurred in the San Joaquin Valley. Archaeological evidence indicates humans were present on the shores of ancient Buena Vista Lake by approximately 8,000 years ago. A deeply buried cultural stratum at site CA-KER-116, on the western edge of Buena Vista Lake, revealed hunting and butchering artifacts suitable for large game. Another notable site is the Witt site, near Tulare Lake. Thus, it is presumed that the adaptive strategy was one of generalized hunting and gathering focused on the exploitation of wetland resources.

Pinto Period (7000–4000 B.P.). A generalized hunting and gathering strategy continued into the Pinto Period; however, it underwent marked changes with the onset of greater aridity. The Pinto Period is characterized by a decrease in population in response to variable and unstable climatic conditions and a decrease in permanent wetland habitats beginning in the mid-Holocene. This period corresponds to Antevs (1953) Altithermal (i.e., hot and dry), although recent research suggests that in the Antelope Valley this aridity was punctuated by wet episodes (Grayson, 1993; Mehringer, 1986). Sites dating to this period tend to be small temporary seasonal camps located near streams and seasonal water sources. They lack developed middens but contain a diverse toolkit consisting of Pinto projectile points, other flaked stone tools, and ground stone milling slabs and hand stones. The appearance of milling tools indicates an increased reliance on seeds and nuts from the scrub and chaparral plant communities as wetland resources diminished. Rhyolite, fine-grained basalts, and poorer quality chert and quartz materials tend to dominate the lithic assemblages.

Gypsum Period (4000–1500 B.P.). The Little Pluvial episode occurs between 5000 and 2000 B.P., marking a period of increased precipitation that intensified every thousand years until ca. 1900 B.P. Modern vegetation and climate was well established by 4300 B.P., and mesquite trees, oaks on the valley margins, and piñon were readily available. The mortar and pestle were introduced to process mesquite pods, acorns, pine nuts, yuccas, and agaves. The archaeological record is marked by the appearance of large village sites reflecting a transition from seasonal migration to year-round or semisedentary settlements (Sutton, 1988). The presence of coastal marine shell artifacts (e.g., *Olivella* beads) and Coso obsidian indicate that long distance exchange systems were in place. Milling tools of various types dominate the artifact assemblages; diagnostic flaked stone artifacts include Humboldt, Elko, Gypsum, and Rose Spring projectile points.

Rose Spring Period (1500–800 B.P.). This period is marked by moderate climatic conditions interrupted by severe drought at 1000–900 B.P and again at 500 B.P. Adaptive strategies remain similar to the Gypsum Period, evinced by large village sites with deep middens reflecting a subsistence strategy focused on hunting and gathering and a continuation of trade networks with coastal and other outside groups (Moratto, 1984:423; Sutton, 1981:217). The biggest difference from the preceding period is the replacement of the atlatl, or spear thrower, by the bow and arrow. Projectile points diagnostic of this period include Rose Spring and Cottonwood points. Also prevalent are stone beads and schist and steatite ground stone artifacts reflecting the development of a regional stone trade. Schist and steatite stone workshops have been identified at habitation sites along Amargosa Creek west of Palmdale (Earle, 2004). The end of the period is marked by a shift away from obsidian importation and an increased use of local cryptocrystallines.

Late Prehistoric Period (800–300 B.P.). Adaptive strategies of the Rose Spring Period continued during the Late Prehistoric Period. With the amelioration of climatic conditions and an increase in precipitation circa 600 B.P., population increased and subsistence practices featured more intensive exploitation of a variety of both large and small mammals and some fish. The number of special purpose sites appears to

increase, use of Coso obsidian declines, and coastal trade items, particularly shell, increase. Use of Rose Spring and Cottonwood points continues during this period, while Desert Side-notched types are also introduced.

Ethnographic Period (300 B.P to present). Ethnographic evidence suggests that the project area was occupied by at least two groups of Shoshonean speakers at the time of first contact with Europeans. These include the Kawaiisu, Numic speakers who lived in Tehachapi Valley and throughout the southern Sierra Nevada in the vicinity of Lake Isabella and Walker Pass and the Kitanemuk (Takic), who resided south of the Kawaiisu and north of the Tataviam on the northwestern edge of the west end of Antelope Valley.

The limited ethnographic information provides few specifics about the daily life of each group. In general, the native occupants lived in large permanent winter villages and dispersed into smaller mobile gathering groups during the late spring, summer, and fall months to harvest piñon nuts, mesquite, yucca, buckwheat, chia, berries, and other seasonally available foods. The villages were exogamous and marriage was patrilocal. Each village was ruled by a headman whose position was ascribed from his father. The villages appeared to remain politically independent, despite marital ties with other villages. The Kawaiisu lived amicably with their southern neighbors, the Kitanemuk, and are known to have participated in cooperative antelope drives with the Yokuts of the San Joaquin Valley (AVIM n.d.).

After A.D. 1770, the native populations of the project area (as in many parts of California) were severely impacted by disease and disrupted settlement patterns as a result of Spanish colonial expeditions and mission recruitment. The destruction of the area's native cultures and societies was completed soon after 1848 by the American invasion.

History

The Spaniards were the first non-Indians to enter the project area. Pedro Fagés led a group of soldiers through Tejon Pass into the San Joaquin Valley in 1772 (Wallace, 1978:459). In 1776, Spanish missionary Franciscan friar Francisco Garcés traveled north to south through the Antelope Valley along the Mojave Indian trail documenting his visit with the Kitanemuk in the southern portion of the project area (Beck and Haase, 1974:15). California Historic Monument No. 130 in Rosamond marks the location where he stopped at Willow Springs (Tipton, 1988). Trappers such as Jedediah Smith and Kit Carson journeyed through Antelope Valley in the 1820s and were followed by John Fremont, who explored the region in 1844, signaling the earliest American presence in the area (Palmdale City Library, 2004).

During the Spanish period land concessions given to settlers were referred to as Spanish ranchos or Spanish land grants. These land grants were turned into ranchos and large settlements used to graze cattle and other stock animals. Tejon Ranch in Kern County is one of the oldest working ranches in California, as well as in America (Tejon Ranch, 2004). At the time of its purchase in 1843, the ranch was 97,616 acres situated in the southern most section of Kern County. The Rancho Tejon encompasses several Indian villages that were occupied until the end of the 19th century (Hoover et al., 1990:120). Established in 1854 on a section of Rancho Tejon, Fort Tejon protected an important point along the north–south wagon route and warded off Indian attacks in the area (Hoover et al., 1990:121). By the mid-century, Native American populations felt the impact of the Hispanic and American graziers, miners, and explorers on their territories and were forced to relocate onto reservations or move deeper in the Sierra Nevadas. In 1850, General Edward Beale established a government reservation for the Indians at Rancho Tejon. The reservation failed and General Beale bought the Tejon Ranch in 1865 keeping many of the Indians on as vaqueros and laborers (Hoover et al., 1990).

California's accession to the Union in 1850 led to several infrastructural developments in the region. From 1853 to 1863, the San Joaquin Valley, Tehachapi Mountains, and western Antelope Valley became centers of gold and silver mining. Small mining towns such as Randsburg and Calico were established during this period and Mojave, Barstow, and Rosamond became major suppliers for the mining operations. Willow Springs became a stage stop in 1860 (Tipton, 1988), and a telegraph line connecting San Francisco and Los Angeles was strung through the Mojave Desert that same year (County of Los Angeles Public Library, 2000). Nevertheless, the Tehachapis and Antelope Valley remained largely undeveloped. It was not until 1876, when the Southern Pacific Railroad completed its line through the valley and stations were established at Lancaster, Alpine (Palmdale), and Acton, that more permanent settlements took hold (Palmdale City Library, 2004). An influx of people moved to the area when government-owned land was offered for homesteading.

In 1828, the military arrived in the western Mojave Desert when the dry lakebed near Muroc became and area for general aviation practices. In 1942, the facility was named Army Air base, Muroc Lake, which later became Muroc Air Force Base in 1948. In 1949, the base was renamed Edwards Air Force Base.

Archeology and Historic Resources

Records of archaeological and historical sites and investigations in Kern County repose at the Southern San Joaquin Valley Information Center of the California Historical Resources Information System (CHRIS) at California State University, Bakersfield. A review of data on file at the Information Center revealed several areas within the project area where large numbers of archaeological or historical resources have been recorded, and other areas that have not been examined. A brief summary of the data found at the Information Center is presented below. The data have been organized alphabetically by USGS topographic quadrangle.

Cache Peak. This area has been moderately investigated with approximately 6 square miles of the quadrangle having been subject to previous archaeological surveys. The majority of these investigations occurred largely along the Los Angeles aqueduct, and higher ridges and low-lying areas. Sixty-one prehistoric and historical resources were identified primarily within the higher elevations.

Cross Mountain. This area has been moderately investigated primarily alongside roads in either drainages or narrow canyons. These investigations yielded 69 cultural resources the majority of which consisted of prehistoric sites containing bedrock mortars, flaked and ground stone tools, petroglyphs and/or pictographs. Historical sites identified consist of architectural properties, mines and mining equipment.

Emerald Mountain. Four small archaeological surveys totaling less than 2 square miles have been conducted in the project area. Six cultural resources were identified. These include prehistoric sites with bedrock mortars, flaked and ground stone tools, and pictographs as well as historical sites with prospecting pits, tailings piles and can scatters.

Fairmont Butte. A small portion (less than 5 percent) of the study area falling in the Fairmont Butte quadrangle has been moderately investigated; primarily along the Los Angeles aqueduct and Pacific Crest Trail. Nine historical resources were identified including a section of the Los Angeles aqueduct, a concrete foundation, and trash scatters. No prehistoric resources have been previously identified.

Liebre Twins. This area has been subject to only one archaeological investigation within Canyon Canada del Agua Escondida. No cultural resources were identified during the course of this survey and no other sites have been identified within the project area.

Little Buttes. A small portion of the study area falls within the Little Buttes quadrangle. Eight previous cultural investigations were conducted for commercial and residential development within the project area. No cultural resources were identified.

Mojave. Much of the project area falling with this quadrangle has been previously surveyed. Most investigations occurred along the Los Angeles aqueduct, pipeline routes, California State Route 14, and areas for commercial and residential development. Fifty-one historical and prehistoric resources were identified. Prehistoric sites consist primarily of bedrock milling equipment and flaked and ground stone tools. The majority of the historical sites are architectural properties and trash scatters.

Mojave NE. A small section of the project area falls within this quadrangle. Seven archaeological surveys have been conducted associated with California State Route 14 and the Los Angeles aqueduct. One historical wagon trail was identified paralleling State Route 14 to the northeast.

Monolith. Over 50 percent of the project area within this quadrangle has been previously investigated. Most archaeological surveys have occurred along the Los Angeles aqueduct, roadways, and areas for commercial and/or residential development. Eighty-eight historical and prehistoric resources were identified. Prehistoric sites consist primarily of bedrock milling equipment and flaked and ground stone tools. The majority of the historical sites are architectural properties and trash scatters.

Neenach School. This portion of the project area remains relatively uninvestigated with less than 5 percent having been subject to archaeological survey. These investigations occurred primarily along the Los Angeles aqueduct, pipeline routes and access roads, and a portion of the Pacific Crest Trail. Three cultural resources have been identified; two of which are historical.

Soledad Mountain. The northwest quadrant of Soledad Mountain falls within the project area. Approximately 20 percent has been subject to archaeological survey; primarily along the Los Angeles aqueduct, the Southern Pacific Railroad, and at Soledad Mountain. Seventeen historical resources were identified, with all but three resources associated with past mining activity including mines and/or mining equipment.

Tehachapi NE. Approximately 50 percent of the project area within this quadrangle has been surveyed resulting in the identification of seventy-seven cultural resources. The majority of these resources are prehistoric lithic scatters and larger habitation sites within Horse Canyon.

Tehachapi South. This area has been moderately investigated with approximately thirty percent of the project area having been subject to archaeological surveys. The majority of these investigations occurred largely along pipeline routes, and in areas for commercial and residential areas. These investigations yielded four prehistoric cultural resources consisting of cairns, rock rings, bedrock mortars, and flaked stone tools.

Tylerhorse Canyon. Approximately 12 square miles of the project area within this quadrangle has been surveyed. The majority of these were conducted along the Los Angeles aqueduct and Pacific Crest Trail. Twenty-nine historical and prehistoric resources were identified. Prehistoric sites consist primarily of bedrock milling equipment and flaked and ground stone tools. The majority of the historical sites are architectural properties and trash scatters.

Willow Springs. Approximately 15 percent of the project area within the Willow Springs topographic quadrangle has been subjected to previous archaeological survey; primarily along the Los Angeles aqueduct, proposed transmission line corridors, and at Middle Butte. These studies resulted in the

identification of 14 historic and prehistoric resources, the majority of which were identified along the Los Angeles aqueduct corridor and at Middle Butte.

Winters Ridge. A small portion of the project area falls within Winters Ridge quadrangle. No previous archaeological surveys have been conducted within the project area and no cultural resources have been identified.

Areas of Cultural Sensitivity

Areas with low, medium, and high sensitivity for cultural resources vis-à-vis the proposed project area were established as per the number of sites within a square mile: low sensitivity indicates areas with less than 1 site per square mile; medium sensitivity is used for areas with two to ten sites per square mile; and high sensitivity refers to areas with more than 10 sites per square mile. It is important to note that the density of known sites in a given area may be a function of cultural resources survey coverage and documentation rather than actual or potential resource density. In general, fewer cultural resources investigations have occurred in undeveloped or remote areas than in developed areas, and thus fewer sites are recorded in those areas.

In general, there is a greater potential for historical resources in the desert and butte areas (Soledad Mountain and Middle Butte) associated with the construction and maintenance of the historical Los Angeles Aqueduct and historical mining activities. The foothill and higher elevations of the Tehachapi Mountains are more sensitive for prehistoric sites. Several prehistoric sites containing flaked and ground stone tools, bedrock mortars, petroglyphs, rock rings, and cairns have been identified along major water courses and canyons within the Tehachapi Mountains. Areas of lowest sensitivity are in commercially developed zones, steeper slopes of the Tehachapi Mountains, and in low lying desert areas away from natural springs and water courses.

6.8.1.2 Paleontological Setting

Paleontological resources (fossils) are the remains or traces of plants and animals. This includes actual bones, shells or other organic remnants, impressions/casts/molds, mineral replacement of organisms, or evidence of previous existence such as tracks, trails or burrows. Fossils can range in size from microscopic diatoms or pollen to very large specimens such as mammal bones exceeding three feet in length. Fossils are important scientific and educational resources because of their: 1) ability to document the presence and evolutionary history of both extant and extinct organisms; 2) ability to determine the relative age of strata in which they occur and the geologic events that resulted in the deposition of the sediments that formed those strata and; 3) ability to add to the understanding of past climatic regimes and enhance the overall understanding of climate changes within geologic time frames. Rock units or formations can be considered sensitive if they contain significant paleontological resources. Significant paleontological resources include those fossils that are identifiable, unique or rare and can provide taphonomic, phylogenetic, ecological, climatic or stratigraphic information.

Existing Geological Resources

Geologic formations in the TWRA were determined based on existing geological maps (Jennings, 1977). Based on the characteristics of the formations, each was assigned a probability rating of high, medium or low sensitivity for containing paleontological resources (Table 6.8-1). Due to the high heat, high pressure, or melting of certain types of rock, the basement rocks of granitic origin and the metamorphic rocks in this region are not likely to contain fossils of any kind. High heat, high pressure or melting of rock would destroy any fossils that may have been deposited in the basement rock types.

Table 6.8-1 Generalized Description of Rock Types and Fossil Sensitivity

Map Symbol	Name	Description	Fossil Sensitivity
ls	Marine Sedimentary	Limestone, dolomite, and marble whose age is uncertain but probably Paleozoic or Mesozoic	Low
m	Mixed Rocks	Undivided pre-Cenozoic metasedimentary and metavolcanic rocks of great variety. Mostly slate, quartzite, hornfels, chert, phyllite, mylonite, schist, gneiss, and minor marble	Low
gr-m	Mixed Rocks	Granitic and metamorphic rocks, mostly gneiss and other metamorphic rocks injected by granitic rocks. Mesozoic to Precambrian	Low
gb	Plutonic Rocks	Gabbro and dark dioritic rocks; chiefly Mesozoic	Low
gr^{M2}	Plutonic Rocks	Mesozoic granite, quartz monzonite, granodiorite, and quartz diorite.	Low
Ti	Volcanic Rocks	Tertiary intrusive rocks; mostly shallow (hypabyssal) plugs and dikes.	Low
Tv/Tv^{p}	Volcanic Rocks	Tertiary volcanic flow rocks (Eocene – Miocene), pyroclastic and mudflow deposits with lenses of sedimentary deposits.	Medium to High
QPc	Non-Marine Sedimentary Rocks	Pliocene and/or Pleistocene sandstone, shale, and gravel deposits; mostly loosely consolidated.	High
Q	Sedimentary Rocks	Alluvium, lake, playa, and terrace deposits; unconsolidated and semi-consolidated. Pleistocene to Recent.	High

The primary determining factor for fossil preservation is the presence of water with incoming sediment or deposit of pyroclastic/volcaniclastic material allowing for quick burial of organisms and reducing the chance for predation or decay. The Cenozoic rock types (Tertiary and Quaternary) all contain sedimentary rocks, even those deposited as ash or mudflow sediments during Paleocene to Miocene volcanic activity. Fossils within the volcaniclastic-based rock units would be found as lenses or interbedded layers laid down in lacustrine or fluvial environments. The Plio-Pleistocene sedimentary rock types are sandstone, shale and gravel, all of which are water-laid sediments. The Quaternary rocks, late Pleistocene to present, are all sedimentary rocks identified as alluvium, lake, playa or terrace deposits with water deposited as layers of unconsolidated or semiconsolidated sediment. The Quaternary alluvium deposits could be the result of large landslides or thick sedimentary deposits, possibly overlying older sedimentary rock units. The underlying rock units may only outcrop in isolated localities or in discontinuous outcrops in areas either inside or outside the project boundaries and may not be adequately mapped as individual units or formations. Additionally these underlying rock units may only become exposed as a result of construction excavation. The information about the actual thickness of the alluvium and thus an estimate of depth of underlying rock units is currently not available within published geologic maps of the region.

Existing Paleontological Resources

A records search was conducted through online collection databases at the University of California, Museum of Paleontology (UCMP), the Natural History Museum of Los Angeles County and the literature based PaleoDatabase (www.paleodb.org). Searches of fossil collections and published scientific literature were restricted to Kern County, sedimentary formations known to occur within the project vicinity plus adjoining basins, and restricted to the Tertiary and Quaternary (65 million years ago to Recent). Collection and literature searches included all fossil types (vertebrate, invertebrate, plant, microfossils, and trace fossils).

UCMP records four fossil sites within the project vicinity, all deposited in the interbedded clay and tuff sedimentary layers of the Miocene pyroclastic and mudflow deposits; Cache Peak, Willow Spring, Tehachapi (Miocene) and Tehachapi (Pleistocene). The Cache Peak/Phillips Ranch fossils (Buwalda,

1916) are found within pyroclastic and mudflow deposits of the Miocene Kinnick and Bopesta formations (Section 34, T31S, R24E). The fossil fauna primarily contains horse (*Merychippus* sp.), camel (*Dromomeryx* sp.), and hippopotamus (*Hypohippus* sp.). A fossil flora is also present in about the same stratigraphic level and geographic area (Savage, 1954) containing both tree and shrub taxa. The Willow Spring/Willow Spring Creek fossil site is poorly documented within UCMP with limited information on location and age other than "Kern County, Tertiary." Taxonomically, the fossil fauna includes Chondrichtyes (sharks), Osteichthyes (bony fish), reptiles and mammals, suggesting a marine or near shore deposit. The Tehachapi (Miocene) fossil flora (Axelrod, 1939) is found within the Mojave Quadrangle, T31S, R34E, near Mount Diablo and the town of Meridian. The flora is deposited within the Kinnick Formation and contains 48 genera of plants. A search of the Natural History Museum of Los Angeles and the PaleoDatabase yielded no additional fossil localities within the project vicinity.

Areas surrounding the TWRA within a 25 mile radius of the project boundary were also reviewed using existing geological maps to determine the presence of formations underlying the alluvium. These formations (Table 6.8-2), although not outcropping within the TWRA, could be stratigraphically continuous from adjoining eastern and western basins through to the plutonic, metamorphic and metasedimentary rocks of the basement formations exposed in the Tehachapi and Sierra Nevada Mountain Ranges. At least three formations with well documented fossil localities were found. Each of these fossil bearing formations may only regionally outcrop at the surface, but can be extensively continuous under younger formation units.

Table 6.8-2 Fossil-bearing Formations Nearby the TWRA

Formation Name	Age	Description	Location
Goler Formation	Paleocene	Paleocene rock units, sandstones and mudstones, with a diverse assemblage of fossil mammals, other vertebrates and plants.	Northeast of the TWRA, El Paso Mountains, near Ridgecrest.
Tejon Formation	Eocene	Marine, shoreline associated deposits, fine to medium grain sandstone	Southwest of the TWRA, near Edmonston Pumping Plant, Tehachapi Mountains, Kern County
Ricardo Formation	Miocene	Sedimentary units interbedded within the regional Miocene pyroclastic and volcaniclastic deposits	Northeast of the TWRA, near Red Rock Canyon, west-central El Paso Mountains.

These three formations known to contain fossils are found to the northeast and southwest of the TWRA. The Paleocene Goler Formation, northeast of the TWRA, outcrops in the El Paso Mountains, near Ridgecrest and contains the earliest known mammal fossils west of the Rocky Mountains (McKenna, 1960). The Miocene Ricardo Formation outcrops to the west of the Goler Formation and northeast of the TWRA. The depositional history of the Ricardo Formation is similar to both the Cache Peak and Tehachapi fossil sites within the project boundary. The Ricardo Formation consists of pyroclastic and volcaniclastic ash deposits inter-bedded with lacustrine-based sedimentary deposits. The Ricardo Formation contains records of both mammal (Whistler, 1969) and plant fossil deposits (J. Broughton, personal observation 2001). The Eocene Tejon Formation is found on the western edge of the Tehachapi Mountains approximately 25 miles to the southwest of the city of Tehachapi. This fossil locality (Lindberg and Squires, 1990) is near the California Aqueduct Edmonston Pumping Plant. The fossil-bearing section of the formation is comprised of fine to medium-grained sandstone interbedded with coarse to conglomerated sandstone, indicating marine shore associated deposits. The Tejon Formation, although rich in marine invertebrate fossils, is rarely exposed because it is normally covered by extensive landslides and alluvial slope deposits.

Medium to High Fossil Sensitivity Areas

With at least four documented fossil localities within the area and three known fossil-bearing formations outside the TWRA, certain rock types within the project boundary have the possibility for a medium to high sensitivity for the presence of fossils. All Tertiary sediments within the project boundary have the potential to contain fossils. Due to the restrictive conditions necessary for fossil preservation (water present, abiotic conditions, lack of predation, hard or fossilizable body parts), fossil-bearing outcrops may be scattered throughout the medium to high sensitivity rock types. The Tertiary volcaniclastic sediments, although igneous in nature, have a medium to high sensitivity level due to transportation of sediments by water and deposition into basins. The Plio-Pleistocene sandstone/shale/ gravel deposits possess a high sensitivity for the presence of fossils, again due to transportation and deposition by water into basins. The Quaternary alluvium, also deposited because of water transportation, may overlie older fossil-bearing rock units, may contain moved fossils from underlying rock units, or may have had fossils preserved within the alluvium during deposition.

These medium to high fossil sensitive rock units are primarily found in the east-southeast section of the TWRA. Quaternary alluvium is the primary rock unit found in this section although there are outcrops of Tertiary volcanic, pyroclastic and mudflow deposits. The Plio-Pleistocene sandstone/shale/gravel deposits are restricted to the northeast section of the Tehachapi Valley, while the remainder of the Tertiary volcanic, pyroclastic and mudflow deposits are found in the northern arm of the TWRA.

Alta Wind Project

The Alta Wind Project is located within the southern portion of the TWRA. The cultural and paleontological setting described above for the TWRA applies to the Alta Wind Project as well. One previously recorded site, a historic road dating from pre-1911 has been identified, field-checked, and found to be in good condition and usable, according to the Kern County Initial Study for the proposed Alta Wind Project. Eighty-nine (89) isolated artifacts, including one bedrock mortar and eight historical sites, were found to be located within the project site as a result of the Phase I pedestrian surveys.

6.8.2 Applicable Regulations, Plans, and Standards

6.8.2.1 Federal

Various federal laws, regulations, and guidelines specify how cultural resources are to be managed in the context of projects that are considered “federal undertakings” (per 36 CFR 800). These federal statutes and guideline may be relevant to the proposed project if federal funding is used, federal permits or authorizations are required, or a project crosses land managed by a federal agency.

Among the most relevant federal laws and regulations are: the National Historic Preservation Act of 1966 (NHPA), as amended; the National Environmental Policy Act of 1969 (NEPA); the Archaeological Resources Protection Act of 1979 (ARPA); the Advisory Council on Historic Preservation's regulations, Protection of Historic Properties (36 CFR 800), establishing procedures for compliance with Section 106 of the NHPA; the National Park Service (NPS) regulations, National Register of Historic Places (36 CFR 60); Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines (FR 190: 44716–44742); the Native American Graves Protection and Repatriation Act of 1990 (PL 101–601, NAGPRA) and it’s implementing regulations (43 CFR 10); and the NPS regulations, Curation of Federally-Owned and Administered Archaeological Collections (36 CFR 79). Pertinent federal laws and regulations are summarized below.

- The National Historic Preservation Act of 1966 requires federal agencies to consider the preservation of historic and prehistoric resources. The Act authorizes the Secretary of the Interior to expand and maintain a National Register of Historic Places (NRHP), and it establishes an Advisory Council on Historic Preservation (ACHP) as an independent federal entity. Section 106 of the Act requires federal agencies to take into account the effects of their undertakings on historic properties and afford the ACHP a reasonable opportunity to comment on the undertaking prior to licensing or approving the expenditure of funds on any undertaking that may affect properties listed, or eligible for listing, in the NRHP.
- The National Environmental Policy Act of 1969 requires federal agencies to foster environmental quality and preservation. Section 101(b)(4) declares that one objective of the national environmental policy is to "preserve important historic, cultural, and natural aspects of our national heritage…." For any major federal actions significantly affecting environmental quality, federal agencies must prepare, and make available for public comment, an environmental impact statement (EIS).
- The Archaeological Resources Protection Act of 1979 (16 USC 470aa–470ll) requires a permit for any excavation or removal of archaeological resources from public lands or Indian lands. The statute provides both civil and criminal penalties for violation of permit requirements and for excavation or removal of protected resources without a permit.
- Advisory Council Regulations, Protection of Historic Properties (36 CFR 800) establish procedures for compliance with Section 106 of the National Historic Preservation Act of 1966. These regulations define the Criteria of Adverse Effect, define the role of State Historic Preservation Officer (SHPO) in the Section 106 review process, set forth documentation requirements, and describe procedures to be followed if significant historic properties are discovered during implementation of an undertaking. Prehistoric and historic resources deemed significant (i.e., eligible for listing in the National Register of Historic Places, per 36 CFR 60.4) must be considered in project planning and construction. The responsible federal agency must submit any proposed undertaking that may affect NRHP-eligible properties to the State Historic Preservation Officer (SHPO) for review and comment prior to project approval.
- National Park Service Regulations, National Register of Historic Places (36 CFR 60), set forth procedures for nominating properties to the NRHP, and present the criteria to be applied in evaluating the eligibility of historic and prehistoric resources for listing in the NRHP.
- Archaeology and Historic Preservation; Secretary of the Interior's Standards and Guidelines (FR 190:44716–44742) offer non-regulatory technical advice about the identification, evaluation, documentation, study, and other treatment of cultural resources. Notable in these Guidelines are the "Standards for Archaeological Documentation" (p. 44734) and "Professional Qualifications Standards for Archaeology" (pp. 44740–44741).
- The Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) (PL 101–601) vests ownership or control of certain human remains and cultural items, excavated or discovered on federal or tribal lands, in designated Native American tribes, organizations, or groups. The Act further: requires notification of the appropriate Secretary or other head of any federal agency upon the discovery of Native American cultural items on federal or tribal lands; proscribes trafficking in Native American human remains and cultural items; requires federal agencies and museums to compile an inventory of Native American human remains and associated funerary objects, and to notify affected Indian tribes of this inventory; and provides for the repatriation of Native American human remains and specified objects possessed or controlled by federal agencies or museums.
- Cultural resources are also protected under regulations of the Department of Transportation Act of 1966. Section 4(f) of the Act requires a comprehensive evaluation of all environmental impacts resulting from federal-aid transportation projects administered by the Federal Highway Administration, Federal Transit Administration, and Federal Aviation Administration that involve the use—or interference with use—of several types of land: public park lands, recreation areas, and publicly or privately owned historic properties of federal, state, or local significance. The Section 4(f) evaluation must be sufficiently detailed to permit the U.S. Secretary of Transportation to determine that there is no feasible and prudent alternative to the use of such land, in which case the project must include all possible planning to minimize harm to any park, recreation, wildlife and waterfowl refuge, or historic site that would result from the use of such lands. If there is a feasible and prudent alternative, a proposed project using Section 4(f) lands cannot be approved by the Secretary. Detailed inventories of the locations and likely impacts on resources that fall into the Section 4(f) category are required in project-level environmental assessments.

Federal protection for significant paleontological resources would apply only if construction impacts were to occur on federally owned or managed lands, or if a federal entitlement or other permit is required. Federal legislative protection for paleontological resources stems from the Antiquities Act of 1906 (PL 59-209; 16 United States Code 431 et seq.; 34 Stat. 225), which calls for protection of historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest on federal lands. Additionally the National Environmental Policy Act of 1969 (United States Code, section 4321 et seq.; 40 Code of Federal Regulations, section 1502.25), as amended, requires analysis of potential environmental impact to important historic, cultural, and natural aspects of our national heritage (see above).

6.8.2.2 State

California Environmental Quality Act (State Public Resources Code)

Under the California Environmental Quality Act (Public Resources Code, Section 21000 et seq.; CEQA), a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. A historical resource is a resource that is either listed or eligible for listing in the California Register of Historical Resources, listed in a local registry, or determined to be significant by the lead agency. (See Section 5024.1 and Section 21084 of the Public Resources Code)

A resource eligible for listing on the California Register of Historical Resources (PRC 5024.1, Title 14 CCR, Section 4852) is a resource that:

- *Is associated with events or patterns of events that have made a significant contribution to the broad patterns of the history and cultural heritage of California and the United States.*
- *Is associated with the lives of persons important to the nation or to California's past.*
- *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.*
- *Has yielded, or may be likely to yield, information important to the prehistory or history of the State and the Nation.*

The fact that a resource is not listed in, or determined to be eligible for listing in the California Register of Historical Resources, not included in a local register of historical resources (pursuant to section 5020.1(k) of the Public Resources Code), or identified in a historical resources survey (meeting the criteria in section 5024.1(g) of the Public Resources Code) does not preclude a lead agency from determining that the resource may be a historical resource as defined in Public Resources Code sections 5020.1(j) or 5024.1.

The CEQA *Statutes and Guidelines* direct public agencies to avoid damaging effects on historical resources whenever feasible. If avoidance is not feasible, the importance of the resource must be evaluated using the criteria outlined in the Guidelines. Resources deemed not important by CEQA criteria do not require further discussion in the CEQA process.

If the project may damage an important historical resource, it may have a significant effect on the environment. Direct impacts may occur by:

(1) Physically damaging, destroying, or altering all or part of the resource;

(2) Altering characteristics of the surrounding environment that contribute to the resource's significance;

(3) Neglecting the resource to the extent that it deteriorates or is destroyed. Indirect impacts primarily result from the effects of project-induced population growth. Such growth can result in increased construction as well as increased recreational activities that can disturb or destroy cultural resources; or

(4) The incidental discovery of cultural resources without proper notification.

CEQA provides guidelines for mitigating impacts to archaeological and historical resources in Section 15126.4. Achieving CEQA compliance with regard to treatment of impacts to significant cultural resources requires that a mitigation plan be developed for the resource(s). Preservation in place is the preferred manner of mitigating impacts to significant historical resources.

If human remains are discovered in any location other than a dedicated cemetery, Section 7050.5(b) of the California Health and Safety Code also must be followed.

For paleontological resources, CEQA guidelines, Appendix G, states, in part, that a project will "normally" have a significant effect on the environment if it, among other things, will disrupt or adversely affect….a paleontological site except as part of a scientific study. Furthermore, the California Public Resources Code Section 5097.5 states, in part, that no person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any vertebrate paleontological site, including fossilized footprints, or any other paleontological feature, situated on public lands (lands owned by or under the jurisdiction of the state, city, county, district or public corporation), except with the express permission of the public agency having jurisdiction over such lands.

California Department of Transportation (Caltrans) Regulations

Any project funded or permitted by Caltrans, either directly or through assistance to local governments, is subject to the requirements of federal and state historic preservation laws and regulations. Most Caltrans projects use federal funds or require federal licenses or permits, and are therefore subject to federal environmental laws and regulations. When projects have no federal involvement, only state laws and regulations apply.

To meet these legal requirements, Caltrans has established detailed guidelines for cultural resources management that are outlined in the Caltrans *Environmental Handbook*, Volume 2. These guidelines set forth the policies and procedures to be followed in order to identify, evaluate, and treat project impacts on cultural resources that might be affected by Caltrans projects. The process outlined in the *Environmental Handbook* is designed to meet the requirements of both federal and state law.

6.8.2.3 Local

Kern County General Plan

Policies, goals, and implementation measures in the Kern County General Plan for cultural and paleontological resources applicable to the project area (including the proposed Alta Wind Project) are provided below.

Section 1.10.3 **Archaeological, Paleontological, Cultural and Historical Preservation (General Provisions in the Land Use, Open Space, and Conservation Element)**

Policies

- **Policy 25.** The county will promote the preservation of cultural and historic resources that provide ties with the past and constitute a heritage value to residents and visitors.

Implementation

- **Implementation Measure K.** Coordinate with the California State University, Bakersfield's Archaeology Inventory Center.
- **Implementation Measure L.** The county shall address archaeological and historical resources for discretionary projects in accordance with CEQA.

- **Implementation Measure M.** In areas of known paleontological resources, the County should address the preservation of these resources where feasible.
- **Implementation Measure N.** 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.
- **Implementation Measure O.** 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.

Kern County Zoning Ordinance

The Kern County Zoning Ordinance, under the Wind Energy Combining District Chapter 19.64.140(H), contains development standards and conditions that apply to the operation and siting of turbines. This condition states that all wind projects, including wind generators and towers, shall comply with all applicable County, State and federal laws, ordinances and regulations.

6.8.3 Impact Analysis

This section explains how potential impacts to Cultural and Paleontological Resources associated with development of the TWRA (including the proposed Alta Wind Project) are assessed. Section 6.8.3.1 presents the significance criteria upon which impact determinations are based. This section also briefly describes the methodology for determining the type and degree of impact that would be produced as a result of TWRA development. All impacts and mitigation measures identified for development of the TWRA are presented in Section 6.8.3.2.

6.8.3.1 Criteria for Determining Impact Significance

Impact significance is assessed based on criteria derived from the Kern County Initial Study Checklist. Cultural Resources impacts would be considered significant if activities or actions associated with development of the TWRA (including the proposed Alta Wind Project) would:

- Criterion TWRA CULT1: Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5
- Criterion TWRA CULT2. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5
- Criterion TWRA CULT3: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature
- Criterion TWRA CULT4: Disturb any human remains, including those interred outside formal cemeteries

6.8.3.2 Impacts and Mitigation Measures

The following section describes potential impacts and mitigation measures related to Cultural and Paleontological Resources that could occur as a result of development of the TWRA (including the proposed Alta Wind Project). A summary of identified impacts and associated mitigation measures for the TWRA is presented in Table 6.20-1.

Adverse Change in the Significance of a Historical or Archaeological Resource (Criterion TWRA CULT1 and 2)

Impact TRWA-CULT-1: Future wind development may cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5.

Impact TRWA-CULT-2: Future wind development may cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.

Cultural resources may be encountered during development of the TWRA. These resources may include, but are not limited to, prehistoric and historical archaeological sites and historical buildings and structures associated with agriculture, mining, and early commercial and/or residential development. Properties important to Native American communities and other ethnic groups, including tangible properties possessing intangible traditional cultural values, also may be present. Such resources may exist individually, in groupings of modest size, or in districts covering substantial geographies.

A historical resource, as defined in Section 15064.5 of CEQA, is a cultural resource that meets the criteria for listing on the California Register of Historical Resources and is considered "historically significant" (Pub. Res. Code Section 5024.1, Title 14 CCR, Section 4852). An archaeological resource is an archaeological artifact, object, or site. Archaeological sites may be determined to be a historical resource, as defined in 15064.5(a) of CEQA, or considered to be a "unique archaeological resource". A unique archaeological resource is one which contains information to answer important scientific research questions; has a special and particular quality, such as being the oldest or best example available of its type; or is directly associated with an important prehistoric or historic event or person (Pub. Res. Code Section 21083.2(i)).

Cultural resources are most likely to be impacted by construction of tower/turbine foundations, access roads, and connections to substations. Since the specific impact areas of the proposed projects have not been finalized, and other requirements are unknown at present, project-specific background research and field studies were not performed for this programmatic analysis. To comply with state and federal law, however, such studies must be undertaken in subsequent and project EIRs/EISs to identify project-specific direct and indirect impacts and develop appropriate mitigation measures.

Mitigation Measures for Impact TWRA-CULT-1 and TWRA-CULT-2

TWRA-CULT-1: Project-specific impacts on cultural resources shall be identified at the earliest planning stages of the project. Since avoidance is the preferred means for mitigating impacts on historical resources and unique archaeological resources, cultural resource specialists should be included on the project planning teams and records searches, background research, Native American consultations, field inventories, and other investigations should be performed during initial routing studies or other comparable planning activities. To comply with state and federal laws and regulations governing cultural resources, the applicant should retain a qualified archaeologist to complete the following specific activities prior to certification of the subsequent or project EIR/EIS or other CEQA/NEPA documents.

Records Searches: A records search shall be performed at the Southern San Joaquin Valley Information Center of the California Historical Resources Information System, housed at California State University, Bakersfield. Resources to be examined at the Information Center include site location and survey coverage basemaps, listings on the National Register of Historic Places and California

Register of Historic Resources, State Historic Property Data Files, National Register of Determined Eligible Properties, California Historical Landmarks, California Points of Historic Interest, and California Office of Historic Preservation Archaeological Determinations of Eligibility. As appropriate, background research shall also be conducted at city and county historical societies, libraries, museums, and other institutions that may have relevant information on the nature and location of cultural resources within the project area.

Native American Consultation: The Native American Heritage Commission (NAHC) in Sacramento should be contacted to request a search of their Sacred Lands File for information on the project area. The NAHC will also supply a list of Native American representatives whose traditional lands encompassed the project area. Those included on the NAHC consultant list shall be contacted by letter and follow-up telephone calls to request information about the study area, and to provide them the opportunity to articulate their views on possible impacts of the project and appropriate mitigation measures.

Archaeological Survey: The project area should be systematically traversed on foot using transects spaced 15-20 meters apart. Previously surveyed areas, as indicated by the Information Center survey coverage base maps, shall be resurveyed if prior surveys were completed more than ten years previously or if survey coverage was insufficient due to conditions at the time. Historical or prehistoric archaeological sites discovered within or immediately adjacent to the survey area shall be documented according to current professional standards on the appropriate Department of Parks and Recreation forms (DPR-523). Previously recorded sites shall be revisited, and their documentation shall be updated to the current formats and standards. All sites, features, and isolates shall be photographed using 35-millimeter and/or digital pictures, and their locations plotted on the appropriate USGS topographic 7.5' quadrangle. Planimetric site sketch maps shall be prepared for each archaeological site, depicting site boundaries, concentrations, features, diagnostic artifacts, and areas of disturbance. Site locations shall also be plotted using a Global Positioning System.

Architectural Survey: Buildings, structures, objects, linear cultural features, and other non-archaeological properties shall be inventoried to current professional standards and recorded on the appropriate Department of Parks and Recreation forms (DPR-523). Documentation on previously recorded sites shall be updated to the current formats and standards. All resources shall be photographed using 35-millimeter and/or digital pictures, and their locations plotted on the appropriate USGS topographic 7.5' quadrangle.

Significance Evaluation and Impact Assessment: Any cultural resources that will be directly impacted by the proposed project shall be evaluated for significance according to the criteria of the National Register and/or California Register, as appropriate. If the boundaries of the resource or its spatial relationship to the impact area are unclear, then boundary definition using more detailed surface and subsurface investigations may be required. Significance evaluations may require additional archival and background research, additional field documentation, or other studies. Evaluation of archaeological properties may require test excavations, backhoe trenching, or other forms of subsurface investigation; laboratory processing and analysis of recovered remains; and a variety of special technical studies. These evaluations will define the qualities of the resource that make it significant and assess

site integrity as a means for judging the nature and extent of project impacts. Significance evaluations and impact assessments shall be performed by appropriately qualified specialists meeting the Secretary of Interior's Professional Qualifications Standards (FR 190: 44740–44741). Artifacts and other remains collected from the field, along with field records and other documentation, shall be curated at an institution capable of providing secure, long-term storage, care, and access to the public.

Technical Report/EIR Sections: A technical report documenting the results of the records search, background research, Native American consultation, field surveys, resource evaluations, and other studies shall be prepared. Because this report may detail locations within the project areas known to be culturally sensitive, it shall be confidential technical appendix the EIR/EIS. Summary sections included in the body of the EIR/EIS shall not disclose sensitive site location information. The confidential technical report and EIR/EIS sections shall discuss the importance of historical and archaeological resources identified during the study, identify the potential for significant impacts, and discuss adequate and feasible mitigation measures. The report shall adhere to professional standards outlined by the State Office of Historic Preservation in *Archaeological Resource Management Reports (ARMR): Recommended Contents and Format* (Jackson, 1990).

Agency Consultation: For federally entailed projects, the lead federal agency must consult with the State Historic Preservation Officer (SHPO) regarding the identification, evaluation, and subsequent mitigative treatment of historic resources. The SHPO does not play a role in the CEQA process unless state lands, state-owned properties, or unusually important resources are involved. For federal projects, the SHPO is asked to review and concur with the federal agency's findings regarding the significance of resources and the appropriate treatment. Initial consultation with the SHPO should occur early in the planning process, with follow-on consultation and review at each stage.

If the studies described above determine that "historical resources" or "unique archaeological resources" will be affected by the proposed project, then additional impact mitigation may be required if the project cannot be redesigned to avoid the resource. Impact mitigation may take a variety of forms depending on the nature of the site and the nature and extent impacts. As noted above, site avoidance is the preferred mitigation measure. If historical or unique archaeological resources cannot be avoided entirely, portions of the resources outside the impact area may be preserved in an exclusion zone—a fenced area where construction equipment and personnel are not permitted. Together, avoidance and use of exclusion zones ensures the maximum *in-situ* preservation of significant cultural resources.

Where avoidance is infeasible and historical and unique archaeological resources are jeopardized by a project, one or a combination of the following measures shall be implemented:

- Data recovery excavation;
- Additional analysis of existing collections;
- Additional archival/historical research;
- Photographic documentation;

- Archaeological monitoring during construction, followed by data recovery excavation or other appropriate measures if significant archaeological remains are exposed.

Final decisions regarding impact mitigation shall be made in consultation along the project proponent, regulatory agencies, technical specialists, and other interested parties. If data recovery excavation is the recommended mitigation, then the EIR/EIS must include a data recovery plan. Data recovery shall be supervised by appropriately qualified specialists meting the Secretary of Interior's Professional Qualifications Standards (FR 190: 44740–44741). Artifacts and other remains collected from the field, along with field records and other documentation, shall be curated at an institution capable of providing secure, long-term storage, care, and access to the public.

CEQA Significance Conclusion

The recommended mitigation measures would require the project proponent to follow a comprehensive procedure to assess the magnitude of impacts, and to avoid or mitigate the impacts, if necessary. Typically, impacts would be reduced to less than significant (Class II) with implementation of this mitigation measure. However, due to the potentially large number of resources that could be disturbed as a result of the TWRA project, cumulative impacts to cultural resources would remain a potentially significant impact at a regional level (Class I). Furthermore, it should be noted that photographic documentation or other records of historical buildings or structures prepared to the standards of the Historic American Building Survey or Historic American Engineering Record (commonly referred to as HABS/HAER standards) may constitute appropriate treatment of effects according to federal regulations, but may not mitigate project impacts to a level of less-than-significant according to CEQA standards and its defining case law.

Destruction of Unique Paleontological Resources or Unique Geologic Features (Criterion TWRA CULT3)

Impact TRWA-CULT-3: Future wind development may directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

The TWRA contains a high surface area of exposed rock types possessing a medium to high sensitivity for the possibility of fossils, primarily in the southeast section and within the Tehachapi Valley. Unfortunately many of the recorded fossil sites within the project vicinity were discovered and subsequently published in the early half of the 1900s with uncertainties as to their exact location and present day conditions. Since their discovery and publications, more information and techniques involving tectonic activity, radiometric dating, climatic interpretation, taxonomic affinities and paleoelevation interpretation have been developed. Re-collecting known fossil localities and the possibility of new discoveries would provide new data and improve on older previously published data. Additionally, while vertebrate fossils are usually considered more rare and thus more important than other fossil types, it should be noted that invertebrates, microfossils, plant fossils and trace fossils all can add significant paleontological information.

Mitigation Measure for Impact TWRA-CULT-3

TWRA-CULT-2: The applicant shall retain a qualified paleontologist to conduct a records and literature search at the appropriate institutions, review geological maps for potential fossiliferous formations, and perform a reconnaissance level field survey for the

entire project area. This reconnaissance level survey would further enhance the geologic mapping of the area and identify any areas that exhibit the depositional environments in which fossils are usually found. Additionally once specific areas are selected and scheduled for construction or excavation impact, a detailed field survey should be conducted for specific fossil localities or areas where excavation might expose fossil-bearing formations or destroy fossil-bearing rock units exposed at the surface. Information obtained from the field surveys and background research will be used to prepare a Paleontological Resource Mitigation Plan which shall be submitted to Kern County Planning Department for review and approval prior to the start of construction. The plan shall include the following:

- Procedures for the discovery, documentation, assessment of project effects, recovery, and disposition of paleontological resources encountered during survey and/or construction;
- Verification that the applicant has an agreement with a recognized museum repository (e.g., the Buena Vista Museum), for the disposition of recovered fossils and that the fossils shall be prepared prior to submittal to the repository as required by the repository (e.g., prepared, analyzed at a laboratory, curated, or cataloged); and
- Description of technical reports that will be prepared to document the discovery, assessment of effects, and recovery of paleontological findings.

CEQA Significance Conclusion

Implementation of this mitigation measure would reduce impacts to unknown paleontological resources to a less-than-significant level (Class II).

Disturbance of Human Remains (Criterion TWRA CULT4)

Impact TRWA-CULT-4: Future wind development may disturb any human remains, including those interred outside formal cemeteries.

Cultural resources within the project area could contain historic or prehistoric period interments. Human burials, in addition to being potential historical resources, have specific provisions for treatment in Section 5097 of the California PRC and Sections 7050.5, 7051, and 7054 of the California Health and Safety Code. Disturbing human remains could violate these provisions, as well as destroy the resource resulting in a potentially significant impact.

Mitigation Measure for Impact TWRA-CULT-4

TWRA-CULT-3: If human remains are found, State Health and Safety Code Section 7050.5 requires that work shall stop immediately. No further disturbance shall occur until the Kern County Coroner has made the necessary findings as to origin and disposition pursuant to PRC 5097.98. If the remains are determined to be of Native American descent, the coroner has 24 hours to notify the Native American Heritage Commission. The commission will then contact the most likely descendent of the deceased Native American, who will then serve as a consultant on how to proceed with the remains (e.g., avoidance, reburial). Work at the site will not resume until such remains have been treated in the manner agreed upon by all interested parties.

CEQA Significance Conclusion

While it is entirely possible that a mutually agreeable resolution could be achieved that would protect and/or mitigate impacts to human remains, because the outcome cannot be guaranteed absent the consultation process, potential project impacts on human remains are conservatively assumed to be significant and unavoidable (Class I).

6.9 Geology and Soils

This section addresses the potential Geology and Soils impacts of expected and potential wind development in the TWRA. A description of the Affected Environment for Geology and Soils is presented below in Section 6.9.1, followed by a description of Applicable Laws, Regulations, and Standards in Section 6.9.2, and the Impact Analysis presented in Section 6.9.3.

6.9.1 Affected Environment

The TWRA consists of two geographic areas with distinctly differing physiographic features: the Antelope Valley and the Tehachapi Mountains. The Antelope Valley consists of approximately 1,200 square miles of elevated desert terrain, located along the western edge of the Mojave Desert with an average elevation of 2,500 feet. The Tehachapi Mountains are an east-west trending mountain range at the southern end of the Sierra Nevada which separates the Great Valley from the Mojave Desert and reaches elevations of up to 8,000 feet.

Tehachapi Mountains. The Tehachapi Mountains are an east-west trending mountain range at the southern end of the Sierra Nevada which separates the Great Valley from the Mojave Desert. The Tehachapi Mountains have been sheared into this east-west trend by left-lateral fault movement of the Garlock fault which runs near the southern boundary of the range. The TWRA also includes the Tehachapi Valley, which is a flat-floored alluvial valley within the Tehachapi Mountains covered by Holocene Alluvium and Pleistocene Older Alluvium. The Tehachapi Mountains are primarily composed of Mesozoic Quartz monzonite with local lenses of hornblende diorite. The Tehachapi Mountains are also characterized by deeply incised valleys, steep hillsides, and mountains that lie on the eastern side of the Pacific Crest line descending towards the Mojave Desert.

Antelope Valley. The Antelope Valley consists of approximately 1,200 square miles of elevated desert terrain, located along the western edge of the Mojave Desert and is primarily an alluviated desert plain containing bedrock hills and low mountains. The rocks of the Antelope Valley are characterized by relatively flat-lying topography and valley fill deposits. The Antelope Valley is covered primarily by alluvial deposits of Quaternary age: Holocene Alluvium and Pleistocene Older Alluvium. The Holocene alluvial deposits consist of slightly dissected alluvial fan deposits of gravel, sand and clay. The Older Alluvium is located primarily near the margins of the Antelope Valley at the flanks of the Sierra Pelona and Tehachapi Mountains and consists of weakly consolidated, uplifted and moderately to severely dissected alluvial fan and terrace deposits composed primarily of sand and gravel.

Slope Stability

The TWRA consists of flat land in the southern portion of the area. The southern portion of the TWRA contains the Antelope Valley. This area does not include any areas identified as existing landslides. However, a majority of the TWRA consists of hilly and mountainous terrain of the Tehachapi Mountains. Unmapped landslides and areas of localized slope instability may be encountered in this area. In the steep areas of the Tehachapi Mountains, seismically induced landslides can occur when ground motion causes

unstable or steeply sloping and loosely aggregated soils and rocks to move down slope under the force of gravity.

Soils

The soils in the TWRA reflect the underlying rock type, the extent of weathering of the rock, the degree of slope, and the degree of modification by man. Soil mapping by the USDA National Resource Conservation Service (NRCS) has provided information for surface and near-surface subsurface soil materials. Table 6.9-1 includes general information on what types of soils found within the TWRA.

Table 6.9-1 Summary of Major Soils Units in the TWRA

Soil Name	Description
Soils of the Mojave Desert/Northern Antelope Valley (Southern TWRA)	
Cajon-Arizo-Alko	Very deep and shallow, nearly level to strongly sloping, well drained and excessively drained soils on alluvial fans, alluvial plains and old terraces.
Cajon	Very deep, nearly level to strongly sloping, somewhat excessively drained soils; on alluvial fans and plains.
Rosamond-DeStazo	Very deep, nearly level to moderately sloping, well drained soils; on flood plains and in basins.
Torriothents-Rock Outcrop	This soil type occurs in limited locations in the Southern TWRA. Soil is shallow and very shallow, very steep, well drained soils and Rock outcrop; on mountainous ridges.
Garlock-Neuralia	Very deep and deep, nearly level to moderately sloping, well drained soils on old stream terraces, alluvial fans and alluvial plains.
Soils on the Eastern Foot Slopes of the Tehachapi Mountains (Mid Portion of TWRA)	
Rock Outcrop-Jawbone-Xeric Torriorthents	Rock Outcrop and shallow, hilly to very steep, well drained and somewhat excessively drained soils; on mountainous uplands.
Pajuela-Whitewolf	Very deep, nearly level to steep, somewhat excessively drained soils; on old stream terraces, alluvial fans and flood plains.
Soils on Uplands and Valleys of the Tehachapi Mountains (Northern TWRA)	
Edmunston-Tollhouse-Godde	Deep and shallow, steep to very steep, well drained and somewhat excessively drained soils underlain by weathered granite; on mountainous ranges.
Tweedy Rock Outcrop-Edmunston	Rock outcrop and deep and moderately deep, steep and very steep, well drained soils underlain by weathered granite or schist; on mountainous uplands
Steuber-Tehachapi-Havala	Very deep, nearly level to hilly, well drained soils; on alluvial fans, stream flood plains and terraces of the mountain valleys.

Source: USDA, SCS- General Soil Map, Kern County Southeastern Part

Soils of the Mojave Desert/Northern Antelope Valley. In the southern portion of the TWRA, near Mojave, the general soil types include Cajon-Arizo-Alko, Cajon, Rosamond-DeStazo, Torriothents-Rock Outcrop and Garlock-Neuralia. The surface layer of soils in this area range from sand to clay loam. Most soils in this area are suitable for rangeland, recreation and wildlife habitat. In areas where water is available, some soils are used for cropland or for homesites. Major soil limitations for soils in the southern portion of the TWRA are a high susceptibility of the sandy surface layers to soil blowing, a shallow soil depth, low available water capacity and a hazard of excessive erosion because of slope and inadequate plant cover.

Tehachapi Mountain Foothills. The soils in this area are in relatively dry transitional areas between the high mountains and the Mojave Desert. General soils found within the TWRA along the Tehachapi foothills includes Rock Outcrop- Jawbone-Xeric Torriorthents and Pajuela-Whitewolf. These soils have gravelly loamy sand, gravelly sandy loam, or loamy sand surface layers. These soils are mainly used for rangeland, watershed and wildlife habitat. The main limitations of these soils are excessively steep slopes

(for Rock Outcrop- Jawbone- Xeric Torriothents only), a higher erosion hazard potential, limited soil depth and very low to moderate available water capacity.

Tehachapi Mountains. The general soil types found within the northern portion of the TWRA include Edmunston-Tollhouse-Godde, Tweedy Rock Outcrop-Edmunston and Steuber-Tehachapi-Havala. These soils have gravelly sandy loam, gravelly loam or sandy loam surface layers. Soils in this area are mainly used in rangeland, recreation, watershed and habitat. Some soils in the mountain valleys are more level and used for irrigated crops. The main limitations of these soils are excessively steep slopes, a higher erosion hazard potential, limited soil depth and very low to moderate available water capacity.

Seismic Hazards

Faults and Seismicity

Both the Transverse Ranges and southern Kern County are characterized by numerous geologically young faults. The TWRA may be subject to ground shaking associated with earthquakes on faults of the San Andreas, Garlock, and Transverse Ranges fault systems. Active faults of the San Andreas system are predominantly strike-slip faults accommodating translationalmovement[1]. The predominant active faults in the Project area are the San Andreas, Garlock faults, the Southern Sierra Nevada Fault zone and the White Wolf Fault zone. The Garlock Fault is capable of producing a magnitude 7.3 earthquake and is located within a designated State of California Alquist-Priolo Earthquake Fault Zone.

Based on a Probabilistic Seismic Hazard Assessment for California issued by the United States Geological Survey/California Geological Survey, 2002 (Revised April 2003), the TWRA is located in a zone where the horizontal peak ground acceleration having anywhere between 30 and 50 percent probability of exceedance in 50 years.

Fault Rupture

Perhaps the most important single factor to be considered in the siting of wind turbines is the amount and type of potential ground surface displacement.

Both the San Andreas and Garlock faults are mapped as Earthquake Fault Zones[2] in the vicinity of the TWRA. Proposed wind projects within the TWRA will not be subject to the regulations and guidelines related to the Alquist-Priolo Special Studies Zones Act as long as the projects do not include occupied structures constructed in the Earthquake Fault Zones, the presence of these mapped zones indicates significant potential for fault rupture in the areas considered “zones.”

Fault rupture has occurred historically within the TWRA. The 1857 Fort Tejon Earthquake caused rupture of the local strands of the San Andreas Fault. Although future earthquakes could occur anywhere along the length of the San Andreas and Garlock faults, only regional strike-slip earthquakes of magnitude 6.0 or greater are likely to be associated with surface fault rupture and offset (Pine Tree EIR). It is also important to note that earthquake activity from unmapped subsurface faults is a possibility that is currently not predictable.

[1] Fault block movement in which the blocks have no rotational component, parallel features remain so after movement.
[2] The Alquist-Priolo Special Studies Zones Act, passed in 1972, requires the establishment of “Earthquake Fault Zones” (formerly known as “special studies zones”) along known active faults in California. In order to be designated as an “Earthquake Fault Zone” a fault must be “sufficiently active and well defined” according to State guidelines. Development of occupied structures within these zones is regulated and must conform to strict building codes.

Liquefaction

Liquefaction is the phenomenon in which saturated granular sediments temporarily lose their shear strength during periods of earthquake-induced strong groundshaking. In order to determine liquefaction susceptibility of a region, three major factors must be analyzed. These include: (a) the density and textural characteristics of the alluvial sediments; (b) the intensity and duration of groundshaking; and (c) the depth to groundwater. Older and finer or coarser grained, indurated, and/or well-drained materials are less susceptible to liquefaction. Alluvial deposits underlying the TWRA in the Antelope and Tehachapi Valley areas are not expected to be liquefiable due to deep groundwater levels in these areas.

Alta Wind Project

The geology of the Alta Wind Project site is classified into three groups: late Paleozoic metamorphic rocks, Mesozoic crystalline rocks, and Quaternary age sedimentary deposits. Soil types, geology, and the average groundwater level at the project site indicate a low potential for liquefaction. The soil at the project site is composed of sand, gravel, and cobbles with very little to no fine-grained soil indicating a low probability of impact due to shrink-well soil behavior.

The proposed project is crossed by an Alquist-Priolo Special Study Zone. The north branch of the Garlock fault is considered an active fault (known to have been active during Holocene time, in the past 10,000 years) and crosses the north-western portion of the project site. There is potential for ground surface rupture to occur due to the presence of faults that have displaced recent alluvial deposits that cross the project site. The project site can be expected to experience strong ground shaking caused by moderate to strong earthquakes during the life of the project. It is not located within a State California Seismic Hazard Zone for landslides.

6.9.2 Applicable Regulations, Plans, and Standards

Geologic resources and geotechnical hazards are governed primarily by local jurisdictions. The conservation elements and seismic safety elements of city and county general plans contain policies for the protection of geologic features and avoidance of hazards.

CEQA is the major environmental statute that guides the design and construction in California. This statute sets forth a specific process of environmental impact analysis and public review. In addition, the project owner must comply with additional state and local applicable statutes, regulations and policies. Relevant, and potentially relevant, statutes, regulations and policies are discussed below.

6.9.2.1 Federal

In accordance with Section 402 of the federal Clean Water Act (CWA) and the State Water Resources Control Board (SWRCB) any proposed project within the TWRA (including the proposed Alta Wind Project) that would disturb more than one acre would be subject to the preparation Construction SWPPP (SWRCB, 2006).

6.9.2.2 State

California Environmental Quality Act (CEQA) (Pub. Resource Code sections 21000-21177.1). CEQA was adopted in 1970 and applies to most public agency decisions to carry out, authorize or approve projects that may have adverse environmental impacts. CEQA requires that agencies inform themselves about the environmental effects of their proposed actions, consider all relevant information, provide the public an opportunity to comment on the environmental issues, and avoid or reduce potential

environmental harm whenever feasible. Relevant CEQA sections include those for protection of geological and mineral resources, protection of soil from erosion.

The Alquist-Priolo Earthquake Fault Zoning Act of 1972 (formerly the Special Studies Zoning Act) regulates development and construction of buildings intended for human occupancy to avoid the hazard of surface fault rupture. While this Act does not specifically regulate overhead transmission lines, it does help define areas where fault rupture is most likely to occur. This Act groups faults into categories of active, potentially active, and inactive. Historic and Holocene age faults are considered active, Late Quaternary and Quaternary age faults are considered potentially active, and pre-Quaternary age faults are considered inactive. These classifications are qualified by the conditions that a fault must be shown to be "sufficiently active" and "well defined" by detailed site-specific geologic explorations in order to determine whether building setbacks should be established.

The Seismic Hazards Mapping Act (the Act) of 1990 (Public Resources Code, Chapter 7.8, Division 2) directs the California Department of Conservation, Division of Mines and Geology [now called California Geological Survey (CGS)] to delineate Seismic Hazard Zones. The purpose of the Act is to reduce the threat to public health and safety and to minimize the loss of life and property by identifying and mitigating seismic hazards. Cities, counties, and state agencies are directed to use seismic hazard zone maps developed by CGS in their land-use planning and permitting processes. The Act requires that site-specific geotechnical investigations be performed prior to permitting most urban development projects within seismic hazard zones.

The California Building Code (CBC, 2001) is based on the 1997 Uniform Building Code, with the addition of more extensive structural seismic provisions. Chapter 16 of the CBC contains definitions of seismic sources and the procedure used to calculate seismic forces on structures.

6.9.2.3 Local

Elements of the General Plan for Kern County contain policies for the avoidance of geologic hazards and/or the protection of unique geologic features, as well as for the preservation of paleontologic resources.

The Safety Element (Chapter 4) of the Kern County General Plan (2004) provides policies and measures to minimize injuries and loss of life and reduce property damage from seismic and geologic hazards. The main policy relevant to the Project is "The County shall encourage extra precautions be taken for the design of significant lifeline installations, such as highways, utilities, and petrochemical pipelines".

The Land Use, Open Space, and Conservation Element (Chapter1) of the Kern County General Plan (2004) provides the following policy related to preservation of paleontologic resources: 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. Measures to minimize impacts in the plan include preservation of paleontologic resources in areas with known paleontologic resources, where feasible.

6.9.3 Impact Analysis

This section explains how potential impacts to Geology and Soils associated with development of the TWRA (including the proposed Alta Wind Project) are assessed. Section 6.9.3.1 presents the significance criteria upon which impact determinations are based. This section also briefly describes the methodology for determining the type and degree of impact that would be produced as a result of TWRA development.

All impacts and mitigation measures identified for development of the TWRA are presented in Section 6.9.3.2.

6.9.3.1 Criteria for Determining Impact Significance

Impact significance is assessed based on criteria derived from the Kern County Initial Study Checklist. Geology and Soils impacts would be considered significant if activities or actions associated with development of the TWRA (including the proposed Alta Wind Project) would:

- Criterion TWRA GEO1: Expose People or Structures to Substantial Adverse Effects Involving the Rupture of a known Earthquake Fault.
- Criterion TWRA GEO2: Expose People or Structures to Substantial Adverse Effects Involving Strong Seismic Ground Shaking
- Criterion TWRA GEO3: Expose People or Structures to Substantial Adverse Effects involving Seismic-Related Ground Failure, including liquefaction
- Criterion TWRA GEO4: Expose People or Structures to Substantial Adverse Effects Involving Landslides
- Criterion TWRA GEO5: Result in Substantial Soil Erosion or Loss of Topsoil
- Criterion TWRA GEO6: Be Located on Soil that is Unstable or Expansive
- Criterion TWRA GEO7: Be Located on soils that are incapable of supporting the use of septic tanks or alternative wastewater systems, where sewers are not available

6.9.3.2 Impacts and Mitigation Measures

The following section describes potential impacts and mitigation measures related to Geology and Soils that could occur as a result of development of the TWRA (including the proposed Alta Wind Project). A summary of identified impacts and associated mitigation measures for the TWRA is presented in Table 6.20-1.

Exposure to Earthquake Fault Ruptures (Criterion TWRA GEO1)

Impact TWRA-GEO-1: Future wind development could expose people or structures to hazards associated with the rupture of a known earthquake fault.

Wind energy related facilities within the TWRA would be subject to hazards of surface fault rupture at crossings of active traces of the Garlock fault and other local faults. Wind energy projects would not be subject to the regulations and guidelines related to the Alquist-Priolo Special Studies Zones Act as long as occupied structures if any are proposed are not constructed in the Earthquake Fault Zones identified within the TWRA.

Mitigation Measures for Impact TWRA-GEO-1

TWRA-GEO-1: Prior to the issuance of building or grading permits, applicants of any wind energy projects within the TWRA shall conduct a full geotechnical study to evaluate soil conditions and geologic hazards on the project site and submit it to the Kern County Engineering and Survey Services Department for review and approval. The geotechnical study must be signed by a California-registered professional engineer and must identify the following:

- Location of fault traces and potential for surface rupture;
- Potential for seismically induced ground shaking, liquefaction, landslides, differential settlement, and mudflows;

- Stability of existing cut-and-fill slopes;
- Collapsible or expansive soils;
- Foundation material type;
- Potential for wind erosion, water erosion, sedimentation, and flooding;
- Location and description of unprotected drainage that could be impacted by the proposed development; and
- Recommendations for placement and design of facilities, foundations, and remediation of unstable ground.

TWRA-GEO-2: An applicant of a wind energy project within the TWRA shall determine the final siting of project facilities based on the results of the geotechnical study and implement recommended measures to minimize geologic hazards. The applicant shall not locate project facilities on or immediately adjacent to a fault trace. Kern County Engineering and Survey Services Department will evaluate any applicant's final facility siting design prior to the issuance of any building or grading permits to verify that geological constraints have been avoided.

TWRA-GEO-3: Utility lines crossing potentially active faults shall be designed to withstand vertical and horizontal displacement. If determined necessary by the findings of the site-specific geotechnical study, the applicant shall remove and replace shrink-swell soils with a non-expansive or non-collapsible soil material.

CEQA Significance Conclusion

With the implementation of Mitigation Measures TWRA-GEO-1 through TWRA-GEO-3, potential impacts associated with active fault crossings would be mitigated to less-than-significant levels (Class II).

Exposure to Strong Seismic Ground Shaking (Criterion TWRA GEO2)

Impact TWRA-GEO-2: Future wind development could expose people or structures to hazards associated with strong seismic ground shaking.

Moderate to strong groundshaking may be experienced in the TWRA in the event of an earthquake on the faults in the area. Projects within the TWRA would also be subject to groundshaking from any of the major faults in the region. While the shaking would be less severe from an earthquake that originates farther from the TWRA, the effects, particularly on the ridgelines, could be damaging to wind facility structures.

It is likely that the proposed projects within the TWRA would be subjected to at least one moderate or larger earthquake occurring close enough to produce strong groundshaking in the TWRA.

Mitigation Measures for Impact TWRA-GEO-2

***TWRA-GEO-4*:** A wind energy project applicant within the TWRA shall design wind turbines and all associated infrastructure to withstand substantial ground shaking. All project facilities shall be designed to in accordance with applicable UBC seismic design standards, Kern County Building Code, Chapter 17, and as recommended by a California registered professional engineer in the site-specific geotechnical review

CEQA Significance Conclusion

With implementation of TWRA-GEO-1 through TWRA-GEO-4, Impact TWRA GEO-2 could be reduced to less than significant levels (Class II).

Exposure to Seismic-Related Ground Failure, Including Liquefaction (Criterion TWRA GEO3)

Impact TWRA-GEO-3: Future wind development could expose people or structures to hazards associated with seismic-related ground failure, including liquefaction.

In areas where this is a high potential for seismically induced landslides, liquefaction, settlement, and surface cracking, damage could be caused to project structures within the TWRA at various locations. Liquefaction occurs in low-lying areas where saturated non-cohesive sediments are found. Slope instability and ground-cracking can occur anywhere. Areas that are most susceptible to earthquake-induced landslides and ground-cracking are sloping areas in poorly cemented or highly fractured rocks, areas underlain by loose, weak soils, and areas on or adjacent to existing landslide deposits. Portions of the TWRA specifically in the Tehachapi Mountains are located along hillsides or ridgelines in geologic units of moderate to steep slopes.

CEQA Significance Conclusion

With implementation of TWRA-GEO-1 through TWRA-GEO-4, Impact TWRA-GEO-3 could be reduced to less than significant levels (Class II).

Exposure to Landslide Hazards (Criterion TWRA GEO4)

Impact TWRA-GEO-4: Future wind development could expose people or structures to hazards associated with landslides.

Destabilization of natural or constructed slopes could occur as a result of construction activities due to excavation and/or grading operations. Unmapped landslides and areas of localized slope instability may also be encountered near the hills and slopes of the Tehachapi Mountains. Excavation operations associated with turbine foundation construction and grading operations for temporary and permanent access roads and construction activities in areas of hilly or sloping terrain could result in slope instability, landslides, soil creep, or debris flows. Prior to final design, geotechnical studies should be undertaken to identify site-specific geologic conditions.

Mitigation Measures for Impact TWRA-GEO-4

TWRA-GEO-5: A wind energy project applicant within the TWRA shall design cut/fill slopes for an adequate factor of safety, considering material type and compaction, identified during the site-specific geotechnical study. The slope of cut surfaces shall be no steeper than 2:1 (horizontal to vertical units), unless the applicant furnishes a soils engineering or an engineering geology report, or both, stating that the site has been investigated and giving an opinion that a cut at a steeper slope will be stable and will not create a hazard to public or private property.

TWRA-GEO-6: A wind energy project applicant within the TWRA shall cut slopes with a slope ratio compatible with the known geologic conditions and/or shall stabilize the slope by using stabilizing methods such as a buttressed fill.

TWRA-GEO-7: Wind turbine sites where slopes exceed 4:1 shall require specific consultation and approval by the Kern County Engineering and Survey Services Department, with additional site-specific mitigation.

TWRA-GEO-8: A wind energy project applicant within the TWRA shall avoid locating roads and structures near landslide and mudflow areas. Where avoidance of landslide areas is not feasible, the applicant shall construct relatively flat cut-and-fill at slopes not to exceed 2:1, or 26 percent, or flatter.

TWRA-GEO-9: A wind energy project applicant within the TWRA shall avoid locating turbine locations, transmission lines, and associated structures astride faults, lineaments, or unstable areas.

CEQA Significance Conclusion

Impact TWRA Geo-4 would be significant without mitigation. However, with the implementation of TWRA-GEO-5 through TWRA-GEO-9 this impact could be reduced to less than significant levels (Class II).

Soil Erosion or Loss of Topsoil (Criterion TWRA GEO5)

Impact TWRA-GEO-5: Future wind development construction could result in substantial soil erosion or loss of topsoil.

Excavation and grading for turbine foundations, work areas, and access roads could loosen soil or remove stabilizing vegetation and expose areas of loose soil. These areas, if not properly stabilized during construction, could be subject to increased soil loss and erosion by wind and stormwater runoff. Newly constructed and compacted engineered slopes can also undergo substantial erosion through dispersed sheet flow runoff. More concentrated runoff can result in the formation of small erosional channels and larger gullies, each compromising the integrity of the slope and resulting in significant soil loss. Portions of the TWRA are underlain by soils classified as having moderate to severe hazard of erosion on roads and trails. If the applicant implements water quality protection measures specified in the Construction Storm Water Pollution Prevention Plan (SWPPP), then erosion potential could be lessened.

Section 402 of the federal Clean Water Act (CWA) and the State Water Resources Control Board (SWRCB) requires that any construction project which disturbs one acre or more of ground surface must prepare a Construction SWPPP (SWRCB, 2006). A SWPPP would need to be prepared once a proposed project is approved and after the necessary facilities are sited and designed, in order to ensure site-specific conditions are effectively addressed. All SWPPPs must include Best Management Practices (BMPs) for erosion and sediment control, as well as for construction waste handling and disposal (SWRCB, 2006).

Mitigation Measures for Impact TWRA-GEO-5

TWRA-GEO-10: A wind energy project applicant within the TWRA shall limit grading to the minimum area necessary for construction and operation of the project, and the applicant will retain a California registered professional engineer to review the final grading earthwork and foundation plans prior to construction.

TWRA-GEO-11: As required by Chapter 19.64 (WE Combining District) of the Kern County Zoning Ordinance, a wind energy project applicant within the TWRA shall prepare a Soil Erosion and Sedimentation Control Plan to mitigate potential loss of soil and erosion. The plan will be prepared by a California registered civil engineer or other

professional and submitted for review and approval by the Kern County Engineering and Survey Services Department. The plan will include the following:

- BMPs will be implemented to minimize soil erosion and will be consistent with the requirements of the Kern County grading requirements and the California Regional Water Quality Control Board pertaining to the preparation and approval of Storm Water Pollution Prevention Plans (BMPs recommended by the Kern County Engineering and Survey Department will be reviewed for applicability).
- Measures to be implemented where access roads cross washes to minimize erosion and sedimentation.
- Provisions to maintain flow in washes, should it occur, throughout construction.
- Provisions for site revegetation using native plants.
- Sediment collection facilities as may be required by the Kern County Engineering and Survey Services Department.
- A timetable for full implementation, estimated costs, and a surety bond or other security as approved by the County.
- Other measures required by the County during permitting, including long-term monitoring (post-construction) of erosion control measures until site stabilization is achieved.

The applicant shall regularly inspect all erosion control measures throughout construction and particularly before and after major storm events. The applicant shall promptly replace damaged or ineffective materials or structures.

TWRA-GEO-12: A wind energy project applicant within the TWRA shall conduct grading activities pursuant to Kern County Grading Codes, Chapter 17.28, and as follows:

- Grade sites near slopes and embankments in a way that would prevent or minimize erosion damage to the slope.
- Seed or otherwise revegetate completed slopes.
- On steeper slopes, including on wash embankments, as necessary, use mulching or biodegradable erosion control blankets as appropriate to stabilize the topsoil until vegetation can be re-established.
- On slopes where unusual flow conditions (e.g., flooding) are expected, employ more substantial erosion protection measures such as grouted cobble slope facings or manufactured slope protection.

TWRA-GEO-13: A wind energy project applicant within the TWRA shall frequently water disturbed areas during construction to reduce dust and minimize loss of soils from wind.

TWRA-GEO-14: In all areas disturbed by a project, the applicant shall salvage topsoil and reuse during restoration.

TWRA-GEO-15: A wind energy project applicant within the TWRA shall use existing roads to the greatest extent feasible to minimize increased erosion.

CEQA Significance Conclusion

With implementation of TWRA-GEO-10 through TWRA-GEO-15 this potentially significant impact could be reduced to less than significant levels (Class II).

Unstable or Expansive Soils (Criterion TWRA GEO6)

Impact TWRA-GEO-6: Future wind development could be located on soil that is unstable or expansive.

Any proposed wind energy project within the TWRA would be subject to a geotechnical assessment for soils beneath the proposed project site prior to approval of the project. Ideal soil conditions for a wind energy project within the TWRA should have low to moderate shrink-swell potential and should not include expansive soils.

CEQA Significance Conclusion

Under TWRA-GEO-1 and TWRA-GEO-2 an assessment of soils at each proposed project site is required. All facilities would also be designed to withstand variations in soil density. With implementation of these mitigation measures, Impact TWRA GEO-6 would be considered less than significant (Class II).

Soils Incapable of Supporting Septic Tanks or Alternative Wastewater Systems (Criterion TWRA GEO7)

Impact TWRA-GEO-7: Future wind development could be located on soils that are incapable of supporting the use of septic tanks or alternative wastewater systems.

Wind development within the TWRA is not expected to create a broad need for additional septic tanks or wastewater systems based on the nature of wind development. If facilities that require septic tanks or create additional demand on existing wastewater systems are required by a proposed project within the TWRA, then the project will be assessed on an individual basis to determine the appropriate level of impacts. Additionally, a proposed project will be subject to a geotechnical assessment which will allow for septic tanks to be placed in appropriate areas.

CEQA Significance Conclusion

Although wind energy projects within the TWRA are not expected to create a great need for septic and other wastewater systems, with implementation of TWRA GEO-1 through TWRA GEO-15, project facilities including septic tanks and other wastewater systems would be mitigated to an insignificant level (Class II).

6.10 Hazards and Hazardous Materials

This section addresses the potential Hazards and Hazardous Materials impacts of expected and potential wind development in the TWRA. A description of the Affected Environment for Hazards and Hazardous Materials is presented below in Section 6.10.1, followed by a description of Applicable Laws, Regulations, and Standards in Section 6.10.2, and the Impact Analysis presented in Section 6.10.3.

6.10.1 Affected Environment

Environmental Contamination

The TWRA is located in an area highly susceptible to wildfires. Vegetation in the TWRA consists of juniper woodland, Joshua tree woodland, and Mojave Creosote scrub, with areas of introduced annual grasses, native needle grass grassland, and pine oak woodlands. High-velocity wind conditions typically occur in the TWRA with occasional periods with Santa Ana-like wind conditions. According to Kern County, the fire hazard rating for the TWRA ranges from moderate to very high. The Kern County Fire

Department (KCFD) would be the first responder to a wildfire within the TWRA. As described in Section 6.16 – Public Services, the Keene, Tehachapi, Mojave, Rosamond, Bear Valley, Boron and Stallion Springs Stations of Battalion 1 would be the first from Kern County to respond.

Past uses within the TWRA were primarily agricultural, including grazing, pasture use, and minimal dry land farming. Other land uses include open space use, recreation by off-road motorists and Pacific Trail hikers. The release of hazardous wastes or materials into the soil or groundwater would most likely be associated with dry land farming and animal grazing. These activities include repair, storage, and refueling of trucks and equipment; storage and disposal of equipment, fuel, lubricants, solvents, and batteries; and mixing and storage of herbicides and pesticides. Hazardous materials associated with mines could also be released. Several mineral resources operations are currently taking place within the TWRA and explosives containing hazardous materials may be used during mining activities.

According to the Department of Toxic Substances Control's (DTSC) Hazardous Waste and Substances site "Cortese" List, no hazardous waste facilities subject to corrective action are located within the TWRA.

Other Hazards

The following airports are located within close proximity to the TWRA:

- **Mojave Air and Space Port**, located approximately 1.6 miles east of the TWRA east boundary in the town of Mojave.
- **Edwards Air Force Base**, located approximately 2 miles east-southeast of the TWRA east boundary in the town of Mojave.
- **Pontious Airport**, located approximately 1.28 miles south of the southeastern boundary of the TWRA.
- **Skyotee Ranch Airport**, located approximately 1.88 miles south of the southern boundary of the TWRA.
- **Mountain Valley Airport**, located approximately 0.3 mile west of the western boundary of the TWRA.
- **Tehachapi Municipal Airport**, located approximately 2.6 miles west of the western boundary of the TWRA in the city of Tehachapi.

Kern County Zoning Ordinance, Title 19, restricts the height of structures based on Figure 19.08.160 of the Zoning Ordinance. Future wind projects within the TWRA have the potential to be located within military flight test pathways and would have to limit structures to a height of 400 feet. Based on conversations with Kern County, the military and the county are working on an agreement to allow structures to be built to a height not to exceed 500 feet (Kern County, 2008).The county will adopt such a change into the zoning ordinance. At the time of preparation of this document, a change has not been adopted.

SCE's proposed single-circuit 500-kV electrical transmission line (Segment 10 of the TRTP) would be located in a corridor that trends southwest to northeast and would run from the southern end of the TWRA at the proposed Whirlwind substation to the center of the TWRA at the Windhub substation. Additionally, Segment 4 of the TRTP, which consists of two new 220-kv transmission lines runs northwest from the southern end of the TWRA at the proposed Whirlwind substation approximately 4 miles to the Cottonwind substation. Power generated by future wind projects would be delivered to customers by these regional transmission lines. Future wind projects would also involve the installation of a transmission line that would carry power from the project substation to the SCE interconnect/switchyard (the Cottonwind or Windhub substation).

Potential health effects associated with Electro-Magnetic Fields (EMF) have been investigated since the 1970s. Field intensity, transients, harmonics, and changes in intensity are EMF characteristics that are considered to assess human exposure effects. Several reviews of scientific literature from the 1990s through 2001 have consistently indicated insufficient evidence of an association between EMF exposure and adverse health effects in humans. Since 2001, results of additional research continue to be consistent with earlier studies. The state has not adopted policies or regulations that establish a safe or unsafe distance for residential structures from power transmission lines.

Potential exists for a rotor blade to crack or dislocate from the tower of a turbine if a wind turbine experiences excess speed, material fatigue, excessive stresses, or vibration from seismic shaking. Wind turbine designs have included new technologies to reduce the chances of tower collapse or blade dislocation. Setbacks for wind turbines and associated facilities have been developed by Kern County to prevent potential hazards to proposed project personnel or individuals in the vicinity of the proposed project.

A disease vector is known as an insect that carries a disease-producing micro-organism from one host to another. Mosquitoes are of particular concern in Kern County because they are most abundant and active between May and October (Kern County Department of Public Health, 2004). The Kern Mosquito and Vector Control District performs vector control. However, no established vector control district exists in the area of Kern County where the TWRA is located. The proposed project is not expected to result in trash piles or open containers that could provide breeding areas for mosquitoes or flies.

Alta Wind Project

The proposed Alta Wind Project is located within the southern portion of the TWRA. The setting described above for the TWRA analysis applies to the Alta Wind Project as well. The Alta Wind Project site is also located in an area highly susceptible to wildfires. Vegetation in the Alta Wind Project area also consists of juniper woodland, Joshua tree woodland, and Mojave Creosote scrub, with areas of introduced annual grasses, native needle grass grassland, and pine oak woodlands. The KCFD would also be the first responder to a wildfire at the Alta Wind Project site. According to the DTSC Hazardous Waste and Substances site "Cortese" List, no hazardous waste facilities subject to corrective action are located at the Alta Wind Project site.

The Alta Wind Project is located approximately 4 miles from the Mojave airport and approximately 5 miles from the boundary of the Edwards Air Force Base. The bulk of base operations, including control towers, runways and radar installations of the Edwards Air Force Base are located approximately 20 miles to the east-southeast. Similar to the TWRA, the Alta Wind Project has the potential to be located within military flight test pathways and would have to limit structures to a height of 400 feet.

SCE's proposed single-circuit 500-kV electrical transmission line (Segment 11 of the Tehachapi Renewable Transmission Project) would be located in a corridor that trends southwest to northeast and would run through the middle of the Alta Wind Project site. The Alta Wind Project would also involve the installation of a transmission line that would carry power from the proposed Alta Wind Project substation to the SCE interconnect/switchyard (the Windhub substation).

6.10.2 Applicable Regulations, Plans, and Standards

6.10.2.1 Federal

Activities associated with development of the TWRA (including the proposed Alta Wind Project) would be subject to the same Federal requirements as specified in Section 3.6 (Environmental Contamination and Hazards). The TWRA (including the proposed Alta Wind Project) does not include National Forest System lands, and is therefore not subject to the USDA Forest Service Land Management Plan (FLMP).

6.10.2.2 State

Activities associated with development of the TWRA (including the proposed Alta Wind Project) would be subject to the same State requirements as specified in Section 3.6 (Environmental Contamination and Hazards).

6.10.2.3 Local

Activities associated with development of the TWRA (including the proposed Alta Wind Project) would be subject to the same local requirements as specified in Section 3.6 (Environmental Contamination and Hazards). However, as opposed to the proposed TRTP, which crosses through several different counties, the TWRA (including the proposed Alta Wind Project) is situated entirely within Kern County and is therefore only subject to Kern County regulations and requirements.

6.10.3 Impact Analysis

This section explains how potential impacts to Hazards and Hazardous Materials associated with development of the TWRA (including the proposed Alta Wind Project) are assessed. Section 6.10.3.1 presents the significance criteria upon which impact determinations are based. This section also briefly describes the methodology for determining the type and degree of impact that would be produced as a result of TWRA development. All impacts and mitigation measures identified for development of the TWRA are presented in Section 6.10.3.2.

6.10.3.1 Criteria for Determining Impact Significance

Impact significance is assessed based on criteria derived from the Kern County Initial Study Checklist. Hazards and Hazardous Material impacts would be considered significant if activities or actions associated with development of the TWRA (including the proposed Alta Wind Project) would:

- Criterion TWRA HAZ1: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
- Criterion TWRA HAZ2: 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.
- Criterion TWRA HAZ3: Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or wastes within ¼ mile of an existing or proposed school.
- Criterion TWRA HAZ4: Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazards to the public or the environment.
- Criterion TWRA HAZ5: For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area.

- Criterion TWRA HAZ6: For a project located within the vicinity if a private airstrip, would the project result in a safety hazard for people residing or working in the project area.
- Criterion TWRA HAZ7: Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan.
- Criterion TWRA HAZ8: 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.
- Criterion TWRA HAZ9: Would implementation of the project generate vectors (flies, mosquitoes, rodents, etc.) or have a component that includes agricultural waste? Specifically, would the project exceed the following qualitative threshold:

  The presence of domestic flies, mosquitoes, cockroaches, rodents, and/or any other vectors associated with the project is significant when the applicable enforcement agency determines that any of the vectors:

  i: Occur as immature stages and adults in numbers considerably in excess of those found in the surrounding environment; and

  ii: Are associated with design, layout, and management of project operations; and

  iii: Cause detrimental effects on the public health or well being of the majority of the surrounding population.
- Criterion TWRA HAZ10: Would implementation of the project cause other potential project-related hazards for project personnel or the public.

6.10.3.2 Impacts and Mitigation Measures

The following section describes potential impacts and mitigation measures related to Hazards and Hazardous Materials that could occur as a result of development of the TWRA (including the proposed Alta Wind Project). A summary of identified impacts and associated mitigation measures for the TWRA is presented in Table 6.20-1.

Hazards Associated with the Transport, Use, or Disposal of Hazardous Materials (Criterion TWRA HAZ1)

Impact TWRA-HAZ-1: Future wind development would create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

Future wind projects within the TWRA would use various petrochemicals during construction and operation. Hazardous materials such as vehicle fuels and oils would be used and stored during construction activities, resulting in a potential for soil contamination from improper handling, spills, or leaks. The total volume of fuel (primarily diesel fuel) to be present on site is not expected to exceed 1,000 gallons. Additionally, helicopters may be used to support construction activities in areas where access is limited or where there are environmental constraints to accessing the construction area with standard construction vehicles and equipment. All helicopter construction and maintenance activities would be based at a fly yard and refueling activities for the helicopters could potentially result in soil contamination from improper handling and storage of helicopter fuel at the staging areas or during refueling.

During operation of future wind projects, maintenance activities would likely involve the use and storage of hazardous materials, such as fuels, lubricants and solvents. An approximate amount of 9,000 to 10,000 gallons of transformer oil would be stored in the transformers at the PdV Wind Energy Project Site, which can serve as an approximate amount to be stored at future wind project sites. The projects could

also install a 250 or 500-gallon propane tank to provide fuel for heating the O&M building. The propane tank would be refilled periodically throughout the life of the projects.

Future wind projects are not expected to require the use, treatment, disposal, or transport of significant quantities of hazardous materials. Should future wind projects require the use or presence of these materials, secondary hazards may result, such as fuels with a combustion source igniting and initiating a wildfire. To ensure that hazardous materials are stored properly, the future wind projects would be required to comply with the requirements set forth in the applicable codes and regulations regarding the handling and storage of hazardous materials, under the direct oversight of the Kern County Fire Department (KCFD). In addition, Material Safety Data Sheets (MSDS) would be stored with each material and employee training would be provided to each employee. A Storm Water Pollution Prevention Plan (SWPPP) would also need to be prepared to comply with the National Pollutant Discharge Elimination System (NPDES) permit program. Implementation of Mitigation Measures TWRA-HAZ-1 and 2 would ensure that this impact is less than significant.

Mitigation Measures for Impact TWRA-HAZ-1

TWRA-HAZ-1: In accordance with the California Health and Safety Code and Kern County regulations, applicants of future wind projects shall prepare a Hazardous Materials Business Plan and submit it to the Kern County Environmental Health Services Department for review and approval.

The Hazardous Materials Business Plan will delineate hazardous material and hazardous waste storage areas; describe proper handling, storage, and disposal techniques; describe methods to be used to avoid spills and minimize impacts in the event of a spill; describe procedures for handling and disposing unanticipated hazardous materials encountered during construction; and establish notification procedures for spills. The applicant of a future wind project will provide the Hazardous Materials Business Plan to all contractors working on the project and will ensure that one copy is available at the project site at all times.

CEQA Significance Conclusion

Implementation of Mitigation Measure TWRA-HAZ-1 would substantially reduce the potential that future wind projects within the TWRA would create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. These measures would minimize the potential for hazardous material releases at future wind project sites. Therefore, with the implementation of the mitigation measure described above, Impact TWRA-HAZ-1 would be less than significant (Class II).

Impact TWRA-HAZ-2: Future wind development would involve blasting that would create a hazard to project personnel.

Installation of foundations for wind tower/turbines would require excavation to significant depths. Should blasting be required for foundation installation, potential hazards could affect personnel at future wind project sites. The potential for explosives used during blasting could ignite a fire, which is considered significant due to the moderate to high fire rating within the TWRA. To ensure impacts at future wind project sites would be less than significant, mitigation measure TWRA-HAZ-2 should be implemented.

Mitigation Measures for Impact TWRA-HAZ-2

TWRA-HAZ-2: If blasting is required, the applicants of future wind projects shall contract with a blasting contractor with experience conducting blasting activities, licensed to use Class A explosives, and licensed as a contractor in the State of California. The blasting contractor shall prepare a blasting plan for the proposed blasting activities to prevent endangering worker safety. The blasting plan shall be submitted for review to the Kern County Planning Department, in consultation with the Kern County Engineering and Survey Services Department, the Kern County Fire Department, and the Kern County Air Pollution Control District. The blasting plan shall be approved prior to commencement of any blasting activities. A copy of the blasting plan shall be provided to Edwards Air Force Base. The blasting plan shall:

a. Describe procedures to be implemented to protect workers during blasting, such as using a signaling system to alert workers of an impending blast and using blasting mats to prevent or reduce the number of rock particles thrown into the air;

b. Describe procedures for proper storage and transportation of explosive materials, including protecting explosives from wildfires;

c. Prohibit blasting during extreme fire danger periods; and

d. Comply with the U.S. Bureau of Mines and the Office of Surface Mining Reclamation and Enforcement guidelines for minimizing damage to structures from blasting and various mining operations.

CEQA Significance Conclusion

Implementation of Mitigation Measure TWRA-HAZ-2 would substantially reduce the potential for impacts from blasting at future wind project sites. Therefore, with the implementation of the mitigation measure described above, Impact TWRA-HAZ-2 would be less than significant (Class II).

Release of Hazardous Materials (Criterion TWRA HAZ2)

Impact TWRA-HAZ-3: Future wind development would 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.

Hazardous materials used on-site and in equipment could be accidentally released to the environment during construction and operation of future wind projects within the TWRA. The applicant of a future wind project would be required to prepare a Hazardous Materials Business Plan, which would develop measures for responding to spills. To prevent impacts to water features and wetlands, the applicant would implement TWRA-HAZ-3.

Future wind projects within the TWRA would include facilities that require the use of hazardous materials. The transmission line that would be constructed from the wind project site to the SCE substation would have transformers. The transmission line and operation and maintenance (O&M) facility where hazardous materials would be stored would be sited away from sensitive natural resources to minimize impacts of transformer oil and other hazardous material spills. In addition, the applicant of a future wind project would be required to install concrete berms around the main transformer storage area and propane tanks to prevent hazards associated with the release of hazardous materials. TWRA-HAZ-4 would be implemented to ensure this impact is less than significant at future wind project sites.

During construction and earth-moving activities of future wind projects, buried hazardous materials could be encountered and subsequently released into the environment. In the event that hazardous materials are encountered, the applicant of a future wind project would handle, remove, and dispose of the hazardous materials in accordance with the Hazardous Materials Business Plan and any other applicable local, state, and federal requirements. Mitigation Measure TWRA-HAZ-1 would be implemented to ensure this impact is less than significant at future wind project sites. In addition, the following mitigation measures would be required.

Mitigation Measures for Impact TWRA-HAZ-3

TWRA-HAZ-3: The applicants of future wind projects shall site all fueling, hazardous materials storage areas, and operation and maintenance (O&M) activities involving hazardous materials at least 100 feet away from blue-line drainages as identified on U.S. Geological Survey topography maps and wetlands.

TWRA-HAZ-4: The applicants of future wind projects shall site transmission lines away from sensitive natural resources and construct a concrete containment berm around the main transformer storage area and propane tanks to prevent hazards associated with the release of hazardous materials.

CEQA Significance Conclusion

Implementation of Mitigation Measures TWRA-HAZ-1, TWRA-HAZ-3 and 4 would substantially reduce the potential that future wind projects within the TWRA would 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. These measures would minimize the potential for hazardous material releases and impacts to water features and wetlands. Therefore, with the implementation of the mitigation measures described above, Impact TWRA-HAZ-3 would be less than significant (Class II).

Hazardous Emissions within One-Quarter Mile of a School (Criterion TWRA HAZ3)

Impact TWRA-HAZ-4: Future wind development would emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

No schools are located within one-quarter mile of the TWRA. Schools located closest to the TWRA are Joshua Middle School and Tompkins Elementary School. Joshua Middle School is located in the town of Mojave, approximately 1 mile east of the eastern boundary of the TWRA. Tompkins Elementary School is located in the city of Tehachapi, approximately 1.5 mile west of the western boundary of the TWRA. Therefore, future wind projects within the TWRA would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing school.

Because the development of the TWRA would occur over the course of several years, it is possible that schools could be built within the TWRA during this time period. In the event a future wind project within the TWRA is proposed to be located within one-quarter mile of an existing or proposed school, impacts could occur. A release or spill of hazardous materials during construction could create a hazard to a school through toxic emissions or increased risk of fire ignition. However, as discussed above for Impact TWRA-HAZ-2, the applicant of a future wind project would handle, remove, and dispose of hazardous materials in accordance with the Hazardous Materials Business Plan and any other applicable local, state, and federal requirements. Implementation of Mitigation Measure TWRA-HAZ-1 would ensure impacts

related to emitting or handling hazardous materials within one-quarter mile of an existing school would be less than significant.

CEQA Significance Conclusion

Implementation of TWRA-HAZ-1 would substantially reduce the potential that a future wind project within the TWRA would impact an existing or proposed school located within one-quarter mile of the project site by emitting hazardous emissions or handling hazardous materials. This measure would minimize the potential for hazardous material releases and impacts to existing or proposed schools located within one-quarter mile of a future wind project site. Therefore, with the implementation of the mitigation measure described above, Impact TWRA-HAZ-4 would be less than significant (Class II).

Listed Hazardous Material Sites (Criterion TWRA HAZ4)

Impact TWRA-HAZ-5: Future wind development would be located on sites which are 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.

The majority of the TWRA is undeveloped, rural land. The TWRA also includes scattered wind farms and mining operations. According to the Department of Toxic Substances Control's (DTSC) Hazardous Waste and Substances site "Cortese" List, no hazardous waste facilities subject to corrective action are located within the TWRA.

CEQA Significance Conclusion

Future wind development is not anticipated to be located on sites which are included on a list of hazardous materials sites or create a significant hazard to the public or the environment. This impact is considered less than significant and no mitigation is required (Class III).

Safety Hazards for Project located within the adopted Kern County Airport Land Use Compatibility Plan (Criterion TWRA HAZ5)

Impact TWRA-HAZ-6: Future wind development would result in a safety hazard for people residing or working in the project area for a future wind project located within the Kern County Airport Land Use Compatibility Plan (ALUCP).

As described above, several airports lie within close proximity to the TWRA. The TWRA is also located within an area with height restrictions of 400 feet, implemented to protect military operations. Based on conversations with Kern County, the military and the county are working on an agreement to allow structures to be built to a height not to exceed 500 feet (Kern County, 2008). At the time of preparation of this document, the county had not adopted such a change into the zoning ordinance. The applicant of a future wind project within the TWRA would be required to notify the Federal Aviation Administration (FAA) due to the height of structures being over 200 feet in height. Implementation of Mitigation Measures TWRA-HAZ-5 and 6 would ensure that impacts due to the location of future wind project sites within the TWRA in proximity to military aviation operations are less than significant.

Mitigation Measures for Impact TWRA-HAZ-6

TWRA-HAZ-5: The applicants of future wind projects shall limit all turbines to a height not to exceed 400 feet above ground level, unless otherwise allowed by the Kern County Zoning Ordinance.

TWRA-HAZ-6: The applicants of future wind projects shall comply with all requirements to maintain the FAA's Determination of No Hazard to Air Navigation during construction and operation of the turbines. The applicants shall work with the FAA and Air Force to resolve any adverse effects on aeronautical operations prior to issuance of grading or building permits for the affected turbines or area where those disputed turbines will be constructed.

CEQA Significance Conclusion

Implementation of Mitigation Measures TWRA-HAZ-5 and 6 would substantially reduce the potential that the development of future wind projects within the TWRA would result in a safety hazard for people residing or working in the project area. These measures would minimize the potential for future wind projects to interfere with military flight operations or air navigation in the project area. Therefore, with the implementation of the mitigation measures described above, Impact TWRA-HAZ-6 would be less than significant (Class II).

Airstrip Safety Hazards (Criterion TWRA HAZ6)

Impact TWRA-HAZ-7: Future wind development would result in a safety hazard for people residing or working in the project area for a future wind project located within the vicinity of a private airstrip.

As described in Impact TWRA-HAZ-6, several airports lie within close proximity to the TWRA. The Pontious Airport is located approximately 1.28 miles south of the southeastern boundary of the TWRA and the Skyotee Ranch Airport is located approximately 1.88 miles south of the southern boundary of the TWRA. The TWRA is also located within an area with height restrictions of 400 feet, implemented to protect military operations. The applicant of a future wind project within the TWRA would be required to notify the FAA due to the height of structures being over 200 feet in height. Implementation of Mitigation Measures TWRA-HAZ-6 and 7 would ensure that impacts due to the location of future wind project sites within the TWRA in proximity to military aviation operations and private airstrips are less than significant.

Mitigation Measures for Impact TWRA-HAZ-7

TWRA-HAZ-7: The applicants of future wind projects shall coordinate with private airstrips located within 2 miles of the project site during construction and operation of the turbines to ensure that safety hazards are less than significant.

CEQA Significance Conclusion

Implementation of Mitigation Measures TWRA-HAZ-6 and 7 would substantially reduce the potential that the development of future wind projects within the TWRA would result in a safety hazard for people residing or working in the project area. These measures would minimize the potential for future wind projects to interfere with air navigation from private airstrips in the project area. Therefore, with the implementation of the mitigation measures described above, Impact TWRA-HAZ-7 would be less than significant (Class II).

Emergency Access (Criterion TWRA HAZ7)

Impact TWRA-HAZ-8: Future wind development would impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

The development of future wind projects within the TWRA would not alter any emergency access routes that currently exist or modify existing patterns of emergency access. It also would not inhibit access of emergency vehicles by requiring the closure of public roads. A significant increase in future wind project-related traffic is not anticipated and therefore would not affect the existing level of service (LOS) on roads, which could indirectly affect emergency access. The extent of additional access roads that may be built during construction of future wind projects are unknown at this time. If additional access roads are built, they would aid emergency access on the future wind project sites in the event of an emergency.

However, there is a possibility that emergency services would be needed at a location where access is temporarily blocked by a construction zone or permanent gates to a wind site are locked. Advance coordination with emergency service providers in order to develop alternative routes and adjust service areas and destinations as necessary to maintain emergency service coverage and response times, would mitigate this impact to less than significant. Emergency service providers would be aware of any potential delays, lane closures, and/or roadway closures prior to construction activities and would be able to maintain emergency service coverage. Mitigation Measure TWRA-HAZ-7 would be implemented to ensure this impact is less than significant.

Mitigation Measures for Impact TWRA-HAZ-8

TWRA-HAZ-8: The applicant of future wind projects shall coordinate in advance with the Kern County Emergency Medical Services Department (EMS) to avoid restricting movements of emergency vehicles. The applicant of future wind projects in coordination with the Kern County EMS shall notify respective police, fire, ambulance and paramedic services and inform Kern County of the proposed locations, nature, timing and duration of any activities and advise of any access restrictions, such as locked gates, that could impact their effectiveness during wind facility construction and operation.

CEQA Significance Conclusion

Implementation of Mitigation Measure TWRA-HAZ-7 would substantially reduce the potential that future wind projects within the TWRA would impair implementation of or physically interfere with an adopted emergency response or emergency evacuation plan. This mitigation measure would allow emergency service providers to be aware of any access restrictions ahead of time. With the implementation of the mitigation measure described above, Impact TWRA-HAZ-8 would be less than significant (Class II).

Exposure to Wildland Fires (Criterion TWRA HAZ8)

Impact TWRA-HAZ-9: Future wind development would expose people or structures to a significant risk of loss, injury or death involving wildland fires.

Fire potential at future wind project sites within the TWRA would be reduced with manned operations, which would reduce traffic associated with non-property owners and decrease unauthorized use of the TWRA area to non-property owner off-road vehicle use, camping with open fires, and hunting. A network of fire breaks would be introduced by new roads, thus reducing the opportunity for fires to become out of control. Danger of fire will however increase during future wind project construction due

to the use of heated mufflers, explosives, and possible disposal of cigarettes. Lightning strikes on wind turbines and fire sparks from the wind turbine generators during operation could result in a fire as well. This impact would be less than significant with the implementation of Mitigation Measure TWRA-HAZ-8.

Mitigation Measures for Impact TWRA-HAZ-9

TWRA-HAZ-9: The applicants of future wind projects shall develop and implement a Fire Safety Plan for use during construction and operation. The applicants shall submit the plan, along with maps of future wind project sites and access roads, to the Kern County Fire Department for review and approval prior to issuance of building permits. The plan shall contain notification procedures and emergency fire precautions, including the following:

Construction

a) All internal combustion engines, stationary and mobile, shall be equipped with spark arresters.

b) Spark arresters shall be in good working order.

c) Light trucks and cars with factory-installed (type) mufflers, in good condition, may be used on roads where the roadway is cleared of vegetation.

d) Smoking signs and fire rules shall be posted on the project bulletin board at the contractor's field office and areas visible to employees during the fire season.

e) Equipment parking areas and small stationary engine sites shall be cleared of all extraneous flammable materials.

Operation

a) Warning signs for high-voltage equipment shall be erected.

b) Brush and other dried vegetation around pad-mount transformers, riser poles, and the O&M building shall be cleared annually.

c) Fire extinguishers at the O&M building shall be installed.

d) Employees shall be trained in the implementation of the Fire Safety Plan.

CEQA Significance Conclusion

Implementation of Mitigation Measure TWRA-HAZ-7 would substantially reduce the potential that future wind projects within the TWRA would expose people or structures to a significant risk of loss, injury or death involving wildland fires. With the implementation of the mitigation measure described above, Impact TWRA-HAZ-9 would be less than significant (Class II).

Generation of Vectors (Criterion TWRA HAZ9)

Impact TWRA-HAZ-10: Future wind development would generate vectors (flies, mosquitoes, rodents, etc.) or have a component that includes agricultural waste.

Mosquitoes are of particular concern in Kern County because they are most abundant and active between May and October (Kern County Department of Public Health, 2004). The Kern Mosquito and Vector Control District performs vector control, but no established vector control district exists in the area of Kern County where the TWRA is located. Future wind projects within the TWRA are not expected to result in long periods of standing water, trash piles or open containers that could provide breeding areas for mosquitoes or flies. No mitigation is required.

CEQA Significance Conclusion

The potential for future wind projects within the TWRA to generate vectors or have a component that includes agricultural waste is considered to be a less than significant impact. No mitigation is required (Class III).

Hazards from Turbine Operation (Criterion TWRA HAZ10)

Impact TWRA-HAZ-11: Future wind development would result in other potential project-related hazards for project personnel or the public.

The potential for rotor and tower failure in wind turbines exists, which could affect project personnel of future wind projects or the public. The Wind Energy (WE) Combining District of the Kern County Ordinance requires the design of wind projects to include required setbacks to prevent impacts to the public. Injury from work-related accidents may occur as well as risk of electrical shock from energized facilities. Additionally, the potential for incidental or intentional entry by unauthorized personnel onto the future wind project sites may occur resulting in human health risks. Mitigation Measures TWRA-HAZ-9 through TWRA-HAZ-11 would be implemented to ensure impacts are less than significant.

Mitigation Measures for Impact TWRA-HAZ-11

TWRA-HAZ-10: To prevent rotor and tower failure and avoid potential impacts, the applicants of future wind projects shall design the project to:

a. Conform to international standards for wind turbine generating systems, including the International Electrotechnical Commission's 61400-1: Wind Turbine Generator Systems – Part I: Safety Requirements (1999)—also, the project shall be certified according to these requirements to help assure that the static, dynamic, and defined life fatigue stresses of the blade would not be exceeded under the combined load expected at the project site;

b. Adhere to state and local building codes during turbine installation on the foundations, which would also minimize the risk of rotor and tower failure;

c. Prevent safety hazards from over-speed by installing a comprehensive protection system on each turbine, such as a redundant pitch control system and a backup disk brake system;

d. Prevent safety hazards from tower failure by designing the turbine towers and foundation to withstand wind speeds of 100 mph at the standard height of 30 feet; engineering the turbines according to the applicable seismic zone of the Uniform Building Code Earthquake Standards; and ensuring that all installed equipment shall meet the standards of the National Electrical Manufacturers Association (NEMA), the American National Standards Institute (ANSI), and California Occupational Safety and Health Act (Cal-OSHA);

e. Prevent safety hazards from electrical failure by using a California-registered electrical engineer to design all electrical systems and ensure that electrical systems meet national electrical safety codes and other national standards, including NEMA, ANSI, and Cal-OSHA standards; and

f. Provide the Kern County Planning Department with manufacturer's specifications for the wind turbines, specifying that all turbines be equipped with a braking system, blade pitch control, and/or other mechanism for rotor control and shall have both manual and automatic over-speed controls.

TWRA-HAZ-11: To protect workers from electrical shock and other work-related accidents during the project, the applicants of future wind projects shall implement the following measures:

a. Grounding shall be designed and implemented to the standards of the Institute of Electrical and Electronics Engineers;

b. All turbines and utility lines shall be equipped with automatic and manual disconnect mechanisms;

c. Three circuit breakers that can be both manually and automatically operated shall be provided between each turbine and the connection to the electrical grid;

d. The electrical systems and substations shall be designed by California-registered electrical engineers and shall meet national electrical safety codes and other national standards, including NEMA, ANSI, and Cal-OSHA standards; and

e. These mechanisms shall be installed and tested before interconnection.

TWRA-HAZ-12: To prevent accidents involving the public, the applicants of future wind projects shall implement the following measures:

a. Fence the project site or project infrastructure in accordance with Section 19.64.160 (Development Standards and Conditions) of the Kern County Zoning Ordinance;

b. Limit access to properly trained personnel only;

c. Lock all turbine towers;

d. Lock each down-tower electrical/communication cabinet and install a sign with high-voltage warning;

e. Secure all access road entry points with locking gates; and

f. Post signs at entrance gates that note the existence of on-site high-voltage and underground cables and warn people of electrocution hazards.

CEQA Significance Conclusion

Implementation of Mitigation Measures TWRA-HAZ-9 through TWRA-HAZ-11 would substantially reduce the potential that future wind projects within the TWRA would result in rotor or tower failure. It would also protect workers from electrical shock and other work-related accidents, and prevent accidents involving the public. With the implementation of the mitigation measures described above, Impact TWRA-HAZ-11 would be less than significant (Class II).

6.11 Hydrology and Water Quality

This section addresses the potential Hydrology and Water Quality impacts of expected and potential wind development in the TWRA. A description of the Affected Environment for Hydrology and Water Quality is presented below in Section 6.11.1, followed by a description of Applicable Laws, Regulations, and Standards in Section 6.11.2, and the Impact Analysis presented in Section 6.11.3.

6.11.1 Affected Environment

Topography varies throughout the TWRA, ranging from high desert floor in the southern area to steep slopes of the Tehachapi Mountains in the north. Elevation ranges from 2,500 feet to approximately 8,000 feet above mean sea level (msl). As a result, the environmental setting relevant to Hydrology and Water Quality also varies throughout the TWRA. The Alta Wind Project is located in the southern portion of the TWRA, spanning from the Antelope Valley's desert floor in the southeast to the Tehachapi Mountain foothills in the southwest.

Section 6.11.1.1 describes the data collection methodology used in this Affected Environment analysis, and lists the resources used to gather applicable data. Section 6.11.1.2 describes the Regional Setting for Hydrology and Water Quality in the TWRA including existing, or baseline, conditions.

6.11.1.1 Baseline Data Collection Methodology

Data collection was conducted through review of the following resources: aerial photographs; United States Geological Survey (USGS) topographic maps; National Hydrography Dataset (NHD) and CalWater GIS data; the Lahontan Regional Water Quality Control Board (RWQCB) Basin Plan; the 2006 Clean Water Act (CWA) Section 303(d) List of Water Quality Limited Segments from the State Water Resources Control Board (SWRCB); groundwater basin data from Bulletin 118 – Update 2003 published by the Department of Water Resources (DWR); flood hazard data from the Federal Emergency Management Agency (FEMA).

The study area was defined as the set of existing water resources crossed or overlain by the identified boundaries of the TWRA, which are portrayed in Figures 6.11-1 through 6.11-3. The current condition and quality of these water resources was used as the baseline against which to compare potential impacts of the development of wind projects throughout the TWRA.

6.11.1.2 Regional Setting

Watershed areas, surface water resources, and groundwater resources are discussed in the following section.

Watershed Areas

The State of California uses a hierarchical naming and numbering convention to define watershed areas for management purposes. Watershed boundaries are defined according to size and topography, with multiple sub-watersheds within larger watersheds. A general description of how watershed levels are defined is provided below, in Table 6.11-1 (State of California Watershed Hierarchy Classifications). The NRCS, which is part of the USDA, is responsible for maintaining the California Interagency Watershed Mapping Committee (IWMC), formerly the CalWater Committee. This committee works on watershed mapping and dataset creation throughout the State. The IWMC has defined a set of naming and numbering conventions applicable to all watershed areas in the State, for the purposes of interagency cooperation and management. Table 6.11-1 shows the primary watershed classification levels used by the State of California, as defined by the IWMC, which are applicable to this analysis. Table 6.11-1 also indicates the approximate size that a watershed area may be within a particular classification level, although variation in size is common.

Table 6.11-1. State of California Watershed Hierarchy Classifications

Watershed Level	Approximate Square Miles	Description
Hydrologic Region (HR)	12,735	Defined by large-scale topographic and geologic considerations. The State of California is divided into ten HRs.
Hydrologic Unit (HU)	672	Defined by surface drainage; may include a major river watershed, groundwater basin, or closed drainage.
Hydrologic Area (HA)	244	Major subdivisions of hydrologic units, such as by major tributaries, groundwater attributes, or stream components.
Hydrologic Sub-area (HSA)	195	A major segment of an HA with significant geographical characteristics or hydrological homogeneity.

Source: CalWater, 2007

Figure 6.11-1 (TWRA Watershed Areas and Flood Hazard Zones) depicts the watershed areas which are overlaid by the TWRA, including the Alta Wind Project. As shown in this figure, the TWRA is situated almost entirely within the South Lahontan HR, along the western border of the South Lahontan HR and the Tulare Lake HR. The northwestern portion of the TWRA is situated within the Tulare Lake HR. The Alta Wind Project is situated entirely within the South Lahontan HR.

Within these two Hydrologic Regions, the TWRA also encompasses parts of the following Hydrologic Units: the Antelope HU, which includes the southern portion of the TWRA; the Fremont HU, which includes the central and northeastern portions of the TWRA; the Grapevine HU, which includes the northwestern portion of the TWRA; a small portion of the Kern River HU, along the northern border of the TWRA. (CalWater, 2004) The vast majority of the Alta Wind Project is situated within the Antelope HU, while a very small portion of the northwestern project area is situated within the Fremont HU. Water quality regulation for the watershed areas affected by the TWRA is governed by the Lahontan RWQCB.

The Antelope Valley and Fremont Valley HUs are separated by a topographic and hydrologic divide in the Antelope Valley; however, they are often referred to collectively as the Antelope-Fremont Valleys HU. Within this area, the Fremont Valley HU generally receives surface water runoff from Lone Tree Canyon, Cache Creek, and other ridges adjacent to the area. Throughout most of this watershed, surface water drains toward Koehn Lake, which is a generally dry lake about 20 miles northeast of the community of Mojave. In the southwestern portion of the Fremont Valley HU, where the TWRA is situated, surface water runoff flows south towards Rosamond.

The Antelope Valley HU receives surface water runoff from the San Gabriel Mountains and the Tehachapi Mountains, including Big Rock Creek, Littlerock Creek, Oak Creek, and Cottonwood Creek. There are multiple intermittent or ephemeral waterways in the area which, during extreme rain events, convey surface water runoff to Rosamond Lake, which is located on Edwards Air Force Base northeast of Lancaster and remains dry most of the year. The Antelope Valley HU straddles the Los Angeles-Kern County line and drains a total of 3,387 square miles. Approximately 80 percent of the watershed is characterized by a low to moderate slope (0 to 7 percent). The remaining 20 percent consists of foothills and rugged mountains, some of which reach up to 3,600 feet in elevation. The floor of the Antelope Valley HU generally lacks defined natural channels outside of the foothills and is subsequently subject to unpredictable sheet flow patterns (SDLAC, 2005). The Antelope Valley HU is a closed basin with no outlets to the ocean. All water that enters the watershed either infiltrates into the underlying groundwater basin, or flows toward three playa lakes located near the center of the watershed. Playa lakes are described further below, under the subheading of Surface Water.

The Grapevine HU, which is also known as the Middle Kern-Upper Tehachapi-Grapevine Watershed, is characterized by mountainous terrain of the Tehachapi Range, and includes the following groundwater basins: Tehachapi Valley West Groundwater Basin, Brite Valley Groundwater Basin, and Cummings Valley Groundwater Basin. The Tehachapi Cummings County Water District (TCCWD), which encompasses approximately 266,000 acres of the Grapevine HU, administers the Tehachapi Watershed Planning Project in this HU, which includes several flood control and water storage projects such as the Antelope Dam, a 764-af (acre-foot) storm water collection facility that provides groundwater recharge for storage basins in the Grapevine HU. (TCCWD, 2003) As mentioned, the Grapevine HU includes the northwestern-most portion of the TWRA.

Average annual precipitation in the TWRA varies based on topography. The TWRA is situated in Kern County, which is located in the Mojave Desert Basin, where the climate is generally hot in the summer

and cold in the winter. The southern portion of the TWRA is characterized by high desert conditions that are generally dry with low annual precipitation that occurs mostly in the winter. In contrast, the northern portion of the TWRA is situated in the Tehachapi Mountains, a short transverse range that connects the southern-most Sierra Nevada Mountains (to the east) with the Pacific Coast Mountains (to the west). Climate in this northern portion of the TWRA is therefore typical of mountainous terrain, with a wetter climate and higher annual precipitation than the high desert climate of the southern TWRA. For instance, in the Kelso Lander Valley Groundwater Basin, which is located in the northern-most portion of the TWRA, average annual precipitation is between 6 and 12 inches whereas annual precipitation in the Antelope Valley, in the southern-most portion of the TWRA, is often less than 3 inches. (DWR, 2003)

Surface Water

Surface water in the TWRA is characterized by creeks, streams, ephemeral waterways, desert washes, playa lakes, floodplains, and FEMA-designated Flood Hazard Areas, which are described below.

Water Bodies

As shown in Figure 6.11-1 (TWRA Watershed Areas and Flood Hazard Zones) and described in the preceding section, the TWRA lies within several different Hydrologic Units, including the Antelope Valley HU, Fremont Valley HU, and Grapevine HU (CalWater, 2004). Figure 6.11-2 (TWRA Surface Water) portrays the multiple stream channels which cross through the TWRA, many of which traverse more than one watershed area. Stream channels in this area typically appear as washes on the desert floor, such as in parts of the Antelope Valley HU, and as ephemeral waterways in the foothills, such as those found in the western portion of the Fremont Valley HU. In the mountainous terrain of the northern TWRA, which includes parts of both the Fremont Valley HU and the Grapevine HU, stream channels are more well-defined and due to higher annual precipitation levels in the mountains, these streams should also experience higher rates of flow than those found in the foothills and on the valley floor.

In the northern, more mountainous portion of the TWRA, major named drainages include the following: Cottonwood Creek, Weaver Creek, Caliente Creek, Silver Creek, Indian Creek, Fox Canyon Creek, and Sand Creek. In the southern portion of the TWRA, which includes foothills of the Tehachapi Mountains as well as desert floor in the Mojave Basin, major named drainages include the following: La Rosa Creek, Cache Creek, Oak Creek, Tejon Creek, El Paso Creek, Sacatara Creek, and Cottonwood Creek. The TWRA also includes numerous unnamed, minor, and intermittent stream channels and tributaries of the named waterways identified above. There are no water-bearing lakes or reservoirs within the TWRA. (USGS, 2007) Oak Creek passes through the Alta Wind Project area in an east-west direction, while several tributaries of Oak Creek cross through the Alta Wind Project area in east-west or north-south directions. As shown in Figure 6.10-1, several unnamed and minor stream channels also enter the northern portions of the Alta Wind Project area, which encroaches upon the foothills of the Tehachapi Mountains.

There is one playa lake in the TWRA, called Proctor Dry Lake, which is located within one mile of the area's western border, between Highway 58 (to the south) and East Tehachapi Boulevard (to the north). Proctor Dry Lake is located north of the Alta Wind Project area. A playa lake is formed when rain fills a playa, or small, round depression in the surface of the ground. Playa lakes are usually endorheic, which means they have no outflow of water. Playa lakes are usually dry, and they only receive water following large winter storms. Surface runoff that collects in a playa lake quickly evaporates from the surface, and only a small quantity of water infiltrates to the groundwater due to the nearly impermeable nature of the playa soils. (SDLAC, 2005) The land surrounding and encompassing Proctor Dry Lake is currently used

by a large cattle operation called the east Jameson Ranch (TRCD, 2008). There are also several playa lakes in the Antelope Valley HU; these playa lakes are all located on Edwards Air Force Base, outside of the TWRA, and include the following: Rosamond Lake, which covers approximately 21 square miles; Rogers Dry Lake, which is located east of Rosamond Lake and encompasses approximately 32 square miles; and Buckhorn Dry Lake, which is located between Rosamond and Rogers Dry Lake, encompassing three square miles.

None of the streams or other water bodies within the TWRA are listed as impaired on the 2006 Clean Water Act Section 303(d) List of Water Quality Limited Segments (SWRCB, 2006).

Floodplains

In addition to the defined drainage channels and water bodies in the TWRA, floodplains are an important part of the surface water setting. A floodplain is a geographic area of relatively level land that is occasionally subject to inundation by surface water from rivers or streams that occur within the floodplain. A "100-year flood" refers to the maximum level of water that is expected to inundate a floodplain ten times every 1,000 years. The Federal Emergency Management Agency (FEMA) has estimated the boundaries for 100-year floodplains relevant to the TWRA, as shown in Figure 6.11-1 (TWRA Watershed Areas and Flood Hazard Zones). FEMA has also created Flood Insurance Rate Maps (FIRMs), which define the predicted boundaries of 100-year floods (SCE, 2007). FEMA refers to 100-year floodplains, such as those seen on Figure 6.11-1, as "Flood Hazard Areas." Not all streams have floodplain mapping by FEMA or any other agency. This does not mean the floodplain is not there, only that the floodplain has not been mapped. Any development that takes place in a Flood Hazard Area must comply with floodplain management ordinances (FEMA, 2005).

Groundwater

As shown in Figure 6.11-3 (TWRA Groundwater Basins), the TWRA is underlain by the northern-most portion of the Antelope Valley Groundwater Basin, the southwestern-most portion of the Fremont Valley Groundwater Basin, and the majority of the Tehachapi Valley East Groundwater Basin, in addition to the Kelso Lander Valley Groundwater Basin, which is entirely encompassed by the northern portion of the TWRA. A description of groundwater supply, quality, and basin characteristics for each of these relevant groundwater basins is provided below.

Antelope Valley Groundwater Basin

The Antelope Valley Groundwater Basin underlies approximately 1,580 square miles of alluvial valley in the western Mojave Desert. The basin is bounded on the northwest by the Garlock fault zone at the base of the Tehachapi Mountains and on the southwest by the San Andreas fault zone at the base of the San Gabriel Mountains. The basin is bounded on the east by ridges, buttes, and low hills that form a surface and groundwater drainage divide. In the north, where this basin underlies the TWRA, it is bounded by the Fremont Valley Groundwater Basin at a groundwater divide approximated by a southeastward-trending line from the mouth of Oak Creek through Middle Butte to exposed bedrock near Gem Hill. Farther east, the Antelope Valley Groundwater Basin is bounded by the Rand Mountains. Runoff in Big Rock and Little Rock Creeks from the San Gabriel Mountains and in Cottonwood Creek from the Tehachapi Mountains flows toward a closed basin at Rosamond Lake. Rogers Lake is a closed basin in the northern part of Antelope Valley that collects ephemeral runoff from surrounding hills (DWR, 2003). A few areas in the central portion of the Alta Wind Project area are located within the northern-most portion of the Antelope Valley Groundwater Basin.

Recharge to the Antelope Valley Groundwater Basin is primarily accomplished by perennial runoff from the surrounding mountains and hills. Most recharge occurs at the foot of the mountains and hills by percolation through the head of alluvial fan systems. Big Rock and Little Rock Creeks, in the southern part of the basin (south of the TWRA), contribute about 80 percent of runoff into the basin. Other minor recharge is from return of irrigation water and septic system effluent (DWR, 2003).

The primary water-bearing materials in the Antelope Valley Groundwater Basin are Pleistocene and Holocene age unconsolidated alluvial and lacustrine deposits that consist of compact gravels, sand, silt, and clay. These deposits are coarse and rich in gravel near mountains and hills, but become finer grained and better sorted toward the central parts of the Antelope Valley, south of the TWRA. Coarse alluvial deposits form the two main aquifers of the basin: a lower aquifer and an upper aquifer. Most of the clays in this groundwater basin have been deposited in large perennial lakes during periods of heavy precipitation. These clays are interbedded with lenses of coarser water-bearing material as thick as 20 feet; in contrast, the clay beds are as thick as 400 feet. The lake deposits form a zone of low permeability between the alluvium of the upper aquifer and that of the lower aquifer, although leakage between the two aquifers may occur. The upper aquifer, which is the primary source of groundwater for the Antelope Valley, is generally unconfined whereas the lower aquifer is generally confined (DWR, 2003).

Total basin storage capacity is approximately 70,000,000 acre-feet (af), with a range in annual natural recharge of 31,200 to 59,100 af/year. Since the 1920s, groundwater use has exceeded estimated natural recharge, resulting in overdraft conditions (USGS, 2003). This overdraft has caused water levels to decline by more than 200 feet in some areas and by at least 100 feet in most of the Antelope Valley. Water data collected in 1996 shows that depth to water within the Antelope Valley Groundwater Basin ranges between 100 feet and 500 feet below ground surface (bgs) (USGS, 2003).

The USEPA and the California Department of Public Health regulate drinking water quality under the Safe Drinking Water Act of 1974. This Act sets health-based standards, known as Maximum Contaminant Levels (MCLs), which are used to assess the suitability of groundwater supply for use as drinking water (SCE, 2007). In the Antelope Valley Groundwater Basin, MCLs are exceeded in several wells throughout the basin for the following contaminants: inorganics, radiology, nitrates, pesticides, VOCs and SVOCs (DWR, 2003).

Fremont Valley Groundwater Basin

The Fremont Valley Groundwater Basin underlies 523 square miles of alluvial valley in eastern Kern County and northwestern San Bernardino County. The basin is bounded on the northwest by the Garlock fault zone against impermeable crystalline rocks of the El Paso Mountains and the Sierra Nevada. This basin is bounded on the east by crystalline rocks of the Summit Range, Red Mountain, Lava Mountains, Rand Mountains, Castle Butte, Bissel Hills, and Rosamond Hills. The basin is bounded on the southwest, where it underlies the TWRA, by the Antelope Valley Groundwater Basin along a groundwater divide approximated by a line connecting the mouth of Oak Creek through Middle Butte to exposed basement rock near Gem Hill (DWR, 2003). Roughly half of the Alta Wind Project area (the eastern-most portion of the project site) is located within the Fremont Valley Groundwater Basin.

Natural recharge of the Fremont Valley Groundwater Basin includes the percolation of ephemeral streams that flow from the Sierra Nevada. The general groundwater flow direction is toward Koehn Lake at the center of the valley. There is no appreciable quantity of groundwater flowing out of the basin (DWR, 2003).

The water-bearing materials of the Fremont Valley Groundwater Basin are dominated by Quaternary alluvium and lacustrine deposits. Alluvium is approximately 1,190 feet thick along the margin of the basin and thins toward the middle of the basin, where it is interbedded with thick layers of lacustrine silt and clay near Koehn Lake. Groundwater in the alluvium is generally unconfined, although locally confined conditions occur near Koehn Lake (DWR, 2003).

The total storage capacity of the basin is calculated to be approximately 4,800,000 af. Hydrographs indicate that groundwater elevations declined in the southwestern part of the basin, where it underlies the TWRA, by approximately nine feet between 1957 and 1999 (DWR, 2003). Depth to groundwater in the southern portion of the basin is greater than 100 feet bgs (USGS, 2003).

In the Fremont Valley Groundwater Basin, no primary MCLs are exceeded. However, groundwater in parts of the basin has high concentrations of Total Dissolved Solids (TDS), including fluoride and sodium (DWR, 2003).

Tehachapi Valley East Groundwater Basin

The Tehachapi Valley East Groundwater Basin is a northeast-southwest-trending basin with a surface area of approximately 37 square miles. It is bounded on the north by the Sierra Nevada Mountains and on the south and east by the Tehachapi Mountains. The Tehachapi Valley East Groundwater Basin is separated by an alluvial high topographic boundary from the Tehachapi Valley West Groundwater Basin that is part of the San Joaquin Hydrologic Region. Surface drainage either ponds in Proctor Dry Lake or is drained by Cache Creek from eastward to the Fremont Valley Groundwater Basin. A small section of the northwestern-most portion of the Alta Wind Project area is situated within the Tehachapi Valley East Groundwater Basin.

Historically, groundwater flow in the Tehachapi Valley East Groundwater Basin likely moved towards the east, with a westward-flowing divide at the boundary with the Tehachapi Valley West Groundwater Basin. However, groundwater pumping south of Tehachapi (east of the Tehachapi Valley East Groundwater Basin and downstream of the natural flow direction) has created a “pumping depression” and altered the natural flow of groundwater. The majority of groundwater which currently leaves the basin occurs as streamflow during storm events. (DWR, 2003)

The water-bearing materials of the Tehachapi Valley East Groundwater Basin are dominated by Quaternary alluvium with a minimum depth of 750 feet. This basin is reported to have a storage capacity of 150,000 af and a specific yield ranging from seven percent at its center to 10 percent on the alluvial fan margins. Groundwater levels dropped about 58 feet from 1951 through 1978, but have since recovered by 55 feet as of 1999. (DWR, 2003)

In the Tehachapi Valley East Groundwater Basin, no primary MCLs are exceeded. However, groundwater in parts of the basin has high concentrations of TDS (DWR, 2003). The Tehachapi-Cummings County Water District has jurisdiction over the aquifer.

Kelso Lander Valley Groundwater Basin

The Kelso Lander Valley Groundwater Basin is a northwest-trending basin with a surface area of approximately 17.5 square miles. This basin is bounded by the Sierra Nevada Mountains’ non-water-bearing crystalline rocks, with peaks to the north, east, and southeast in excess of 6,000 feet above sea level, and Sorell Peak to the west in excess of 7,700 feet above mean sea level. Surface drainage flows to the south in Cottonwood Creek, which eventually enters the Fremont Valley (DWR, 2003).

The water-bearing materials of the Kelso Lander Valley Groundwater Basin are dominated by Quaternary alluvium with a maximum thickness of 125 feet, characterized by unconsolidated younger alluvial deposits which are underlain by older, poorly consolidated alluvial deposits. Recharge primarily occurs through percolation of runoff through the basin's alluvium. In addition, recharge also occurs through subsurface inflow and from the direct percolation of precipitation in the Kelso Lander Valley. Groundwater flows moves in a southern direction, towards Jawbone Canyon. (DWR, 2003)

Information is not currently available regarding groundwater level trends, storage, or budget in the Kelso Lander Valley Groundwater Basin. Groundwater quality in this basin is considered marginal to inferior due to elevated fluoride and TDS concentrations. (DWR, 2003)

Alta Wind Project

The proposed Alta Wind Project is located within the southern portion of the TWRA. The setting described above for the TWRA analysis applies to the Alta Wind Project as well. The proposed project is located above the Antelope Valley, Freemont Valley, and Tehachapi Valley East groundwater basins. It is crossed by Oak Creek and numerous other smaller drainages. Portions of the project area are located within a Flood Hazard Area, but it is not located within an area that is subject to flooding due to failure of a levee or dam. Also, the project is not located near an ocean or enclosed body of water, and would not be subject to inundation by seiche or tsunami.

6.11.2 Applicable Laws, Regulations, and Standards

The laws, regulations, and standards related to Hydrology and Water Quality that would be applicable to the proposed TRTP, as described in Sections 3 (Applicable Laws, Regulations, and Standards) of the Specialist Report for Hydrology and Water Quality, would also be applicable to future development of the TWRA (including the proposed Alta Wind Project). Such laws, regulations, and standards are summarized below. Please see the TRTP Specialist Report for Hydrology and Water Quality for detailed descriptions.

6.11.2.1 Federal

Development of the TWRA would be subject to the federal Clean Water Act (33 U.S.C. Section 1251 et seq.), including Section 401 (requiring that actions be certified by the RWQCB), Section 404 (USACE regulation of discharge of dredge or fill material to the waters of the U.S. and adjacent wetlands), and Section 303(d) (requiring states to identify "impaired" water bodies as those which do not meet water quality standards).

The TWRA does not include National Forest System lands, and is therefore not subject to the USDA Forest Service Land Management Plan (FLMP).

6.11.2.2 State

Activities associated with development of the TWRA would be subject to the same State requirements as would the proposed TRTP. In accordance with Section 1602 of the California Fish and Game Code, any public agency proposing a project in the TWRA would require an agreement between the CDFG if it would:

- Divert, obstruct, or change a streambed;
- Use material from the streambed; or

- Result in the disposal, or deposition of debris, waste, or other material containing crumbed, flaked, or ground pavement where it can flow into a stream.

In addition, the Porter Cologne Water Quality Control Act of 1967, Water Code Section 13000 et seq., requires the SWRCB and the nine RWQCBs to adopt water quality criteria to protect State waters. Such criteria would apply to development within the TWRA.

Finally, California Water Code §13260 requires that any person discharging waste, or proposing to discharge waste, within any region that could affect the quality of the waters of the State, other than into a community sewer system, must submit a report of waste discharge to the applicable RWQCB. Any actions related to development of the TWRA that would be applicable to California Water Code §13260 would be reported to the Lahontan RWQCB.

6.11.2.3 Local

As described in Section 6.11.1 (Affected Environment), the TWRA is located in southeastern Kern County. Surface water and groundwater quality and use in this area are regulated by the County of Kern Engineering and Survey Service (KCESS). As opposed to the proposed TRTP, which crosses through several different counties, the TWRA is situated entirely within Kern County and is therefore only subject to Kern County regulations and requirements. Water quality in Kern County is also under the jurisdiction of the Lohantan RWQCB and as such, projects associated with development of the TWRA would be subject to requirements of the Lahontan RWQCB Basin Plan.

6.11.3 Impact Analysis

This section explains how potential impacts associated with development of the TWRA (including the Alta Wind Project) have been assessed with regards to Hydrology and Water Quality. Section 6.11.3.1 presents the significance criteria on which impact determinations are based, as well as Best Management Practices (BMPs) for potential Hydrology and Water Quality impacts. The methodology for determining the type and degree of impact that would be produced as a result of TWRA development, as well as all impacts and mitigation measures identified for development of the TWRA are presented in Section 6.11.3.2.

6.11.3.1 Criteria for Determining Impact Significance

Impact significance is assessed based on criteria derived from the State CEQA Guidelines, Appendix G. Those criteria have been modified to reflect potential environmental impacts that are relevant to development of the TWRA. Hydrology and Water Quality impacts would be considered significant if and activities or actions associated with development of the TWRA (including the Alta Wind Project) would:

- Criterion TWRA HYD1: Violate any water quality standards or waste discharge requirements.
- Criterion TWRA HYD2: Substantially deplete groundwater supplies or interfere with groundwater recharge, such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).
- Criterion TWRA HYD3: Substantially alter the existing drainage pattern of a site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on site or off site.
- Criterion TWRA HYD4: Substantially alter the existing drainage pattern of a site or area, including through the alteration of the course of a stream or river, or substantially increase

the rate or amount of surface runoff in a manner which would result in flooding on site or off site?

- Criterion TWRA HYD5: 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.
- Criterion TWRA HYD6: Otherwise substantially degrade water quality.
- Criterion TWRA HYD7: Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.
- Criterion TWRA HYD8: Place within a 100-year flood hazard area structures which would impede or redirect flood flows.
- Criterion TWRA HYD9: 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.
- Criterion TWRA HYD10: Result in or be subject to damage from inundation by seiche, tsunami, or mudflow.

Table 6.11-2 (Best Management Practices – Hydrology and Water Quality) presents Best Management Practices (BMPs) that would serve to reduce or avoid potential Hydrology and Water Quality impacts associated with development of the TWRA. It is recommended that the BMPs listed in Table 6.11-2 are incorporated into all wind energy projects that are proposed for construction within the TWRA.

Table 6.11-2. Best Management Practices – Hydrology and Water Quality

TWRA-HYD-1	Construction SWPPP. A Construction SWPPP would be developed for all wind development projects within the TWRA. Notices of Intent (NOIs) would be filed with the SWRCB and/or the RWQCBs, and a Waste Discharge Identification Number (WDID) would be obtained prior to construction. The SWPPP would be stored at the construction site for reference or inspection review. In addition, grading permit applications would be submitted, as applicable, to local jurisdictions. Implementation of the SWPPP would help stabilize graded areas and waterways, and reduce erosion and sedimentation. The plan would designate BMPs that would be adhered to during construction activities. Erosion minimizing efforts such as straw wattles, water bars, covers, silt fences, and sensitive area access restrictions (for example, flagging) would be installed before clearing and grading begins. Mulching, seeding, or other suitable stabilization measures would be used to protect exposed areas during construction activities. During construction activities, measures would be in place to ensure that contaminates are not discharged from the construction sites. The SWPPP would define areas where hazardous materials would be stored, where trash would be placed, where rolling equipment would be parked, fueled and serviced, and where construction materials such as reinforcing bars and structural steel members would be stored. Erosion control during grading of the construction sites and during subsequent construction would be in place and monitored as specified by the SWPPP. A silting basin(s) would be established, as necessary, to capture silt and other materials, which might otherwise be carried from the site by rainwater surface runoff.
TWRA-HYD-2	Environmental Training Program. An environmental training program would be established to communicate environmental concerns and appropriate work practices, including spill prevention and response measures, and SWPPP measures, to all field personnel. A monitoring program would be implemented to ensure that the plans are followed throughout the period of construction.
TWRA-HYD-3	Accidental Spill Control. The Construction SWPPP identified above would include procedures for quick and safe cleanup of accidental spills. The Construction SWPPP would prescribe hazardous materials handling procedures for reducing the potential for a spill during construction, and would include an emergency response program to ensure quick and safe cleanup of accidental spills. The SWPPP would identify areas where refueling and vehicle maintenance activities and storage of hazardous materials, if any, would be permitted.
TWRA-HYD-4	Non-storm Water and Waste Management Pollution Controls. Oil-absorbent materials, tarps, and storage drums would be used to contain and control any minor releases of potentially harmful waste. In the event that excess water and liquid concrete escapes from foundations during pouring, it would be directed to bermed areas adjacent to the borings where the water would infiltrate or evaporate and the concrete would remain and begin to set. Once the excess concrete has been allowed to set up (but before it is dry), it would be removed and transported to an approved landfill for disposal.
TWRA-HYD-5	Hazardous Material Identification. A Phase I Environmental Site Assessment (ESA) would be performed at each proposed wind development location. Depending on the results of the Phase I ESA, soil sampling would be conducted and remedial activities would be implemented, if applicable. If hazardous materials are encountered during any construction activities, work shall be stopped until the material is properly characterized and appropriate measures are taken to protect human health and the environment. If excavation of hazardous materials is required, they shall be handled, transported, and disposed of in accordance with federal, State, and local regulations.

Table 6.11-2. Best Management Practices – Hydrology and Water Quality	
TWRA-HYD-6	Excavation and Blasting Site Dewatering Management. Any dewatering operations associated with excavation and blasting sites in the TWRA would follow applicable State and local regulatory requirements. If groundwater were encountered while performing excavation or blasting activities for turbine tower construction, dewatering operations would be performed to protect the groundwater resources. These procedures would include, as applicable, the use of sediment traps and sediment basins in accordance with BMP NS-2 (Dewatering Operations) from the California Stormwater Quality Association's (CASQA) California Stormwater BMP Handbook – Construction (CASQA, 2003).
TWRA-HYD-7	Flood and Erosion Structure Damage Protection. Infrastructure associated with wind development would not be placed within waterway protection corridors (floodways) defined by city and county codes. Aboveground project features will be designed and engineered to withstand potential flooding and erosion hazards. Although some project features may need to be placed within 100-year floodplain boundaries, they will be designed per applicable floodplain development guidelines. Measures would include specially designed footings to withstand flooding due either to a 100-yr flood event or a failure of a nearby upstream dam or reservoir. The main Project facilities (i.e., substations) will be located outside of known watercourses.
TWRA-HYD-8	Hazardous Materials and Waste Handling Management. Hazardous materials used and stored onsite for the proposed construction activities – as well as hazardous wastes generated onsite as a result of the proposed construction activities – would be managed according to the specifications outlined below. • Hazardous Materials and Hazardous Waste Handling: A project-specific hazardous materials management and hazardous waste management program shall be developed. The program would outline proper hazardous materials use, storage and disposal requirements as well as hazardous waste management procedures. The program would identify types of hazardous materials to be used during development of the TWRA and the types of wastes that would be generated. All project personnel would be provided with project-specific training. This program would be developed to ensure that all hazardous materials and wastes were handled in a safe and environmentally sound manner. Hazardous wastes would be handled and disposed of according to applicable rules and regulations. Employees handling wastes would receive hazardous materials training and shall be trained in hazardous waste procedures, spill contingencies, waste minimization procedures and treatment, storage and disposal facility (TSDF) training in accordance with OSHA Hazard Communication Standard and 22 CCR. SCE would use landfill facilities that are authorized to accept treated wood pole waste in accordance with HSC 25143.1.4(b). • Transport of Hazardous Materials: Hazardous materials that would be transported by truck include fuel (diesel fuel and gasoline) and oil and lubricants for equipment. Containers used to stored hazardous materials would be properly labeled and kept in good condition. Written procedures for the transport of hazardous materials used would be established in accordance with U.S. Department of Transportation and Caltrans regulations. A qualified transporter would be selected to comply with U.S. Department of Transportation and Caltrans regulations. • Fueling and Maintenance of Construction Equipment: Written procedures for fueling and maintenance of construction equipment would be prepared prior to construction. Vehicles and equipment would be refueled onsite or by tanker trucks. Procedures would include the use of drop cloths made of plastic, drip pans and trays to be placed under refilling areas to ensure that chemicals do not come into contact with the ground. Refueling stations would be located in designated areas where absorbent pad and trays would be available. The fuel tanks would also contain a lined area to ensure that accidental spillage does not occur. Drip pans or other collection devices would be placed under the equipment at night to capture drips or spills. Equipment would be inspected daily for potential leakage or failures. Hazardous materials such as paints, solvents, and penetrants would be kept in an approved locker or storage cabinet. • Emergency Release Response Procedures: An Emergency Response Plan detailing responses to releases of hazardous materials would be developed prior to construction activities. It would prescribe hazardous materials handling procedures for reducing the potential for a spill during construction, and would include an emergency response program to ensure quick and safe cleanup of accidental spills. All hazardous materials spills or threatened release, including petroleum products such as gasoline, diesel, and hydraulic fluid, regardless of the quantity spilled would be immediately reported if the spill has entered a navigable water, stream, lake, wetland, or storm drain, if the spill impacted any sensitive area including conservation areas and wildlife preserved, or if the spill caused injury to a person or threatens injury to public health. All construction personnel, including environmental monitors, would be aware of state and federal emergency response reporting guidelines.
TWRA-HYD-9	Spill Prevention, Countermeasure, and Control Plan (SPCC Plan). In accordance with Title 40 of the CFR, Part 112, an SPCC Plan shall be prepared for the TWRA. The plans would include engineered and operational methods for preventing, containing, and controlling potential releases, and provisions for quick and safe cleanup.

6.11.3.2 Impacts and Mitigation Measures

This analysis first established baseline conditions for the affected environment and regional setting relevant to Hydrology and Water Quality, as presented above in Section 6.11.1. These baseline conditions were evaluated based on their potential to be affected by reasonably foreseeable construction activities as well as operation and maintenance activities for projects associated with development of the TWRA. As described in Section 6.2, activities that are reasonably expected to occur through development of the

TWRA, including construction and installation of wind turbines, operations and maintenance, and decommissioning, may extend over a period of 25 to 40 years. The specific locations and intensities of these development-related activities are currently unknown and therefore, this analysis of impacts to Hydrology and Water Quality is based upon reasoned assumptions. Impacts to Hydrology and Water Quality have been identified based on the predicted and reasonably foreseeable interactions between construction, operation, and maintenance activities with the affected environment.

The following section describes potential direct and indirect impacts related to Hydrology and Water Quality that could occur as a result of projects associated with development of the TWRA; potential direct and indirect impacts of the Alta Wind Project are also discussed in the following section. A summary of identified impacts and associated mitigation measures for the TWRA is presented in Table 6.20-1.

Water Quality or Waste Discharge Violations (Criterion TWRA HYD1)

Projects associated with development of the TWRA would result in an impact to Hydrology and Water Quality under Criterion TWRA HYD1 if associated construction, maintenance, or decommissioning activities would result in the violation of any water quality or waste discharge standards. Such violations could occur through the creation of erosion, sedimentation, and/or polluted runoff, or through the accidental release of potentially hazardous materials required during construction or operational activities. Applicable water quality standards and regulations are presented in Section 6.11.2 (Applicable Laws, Regulations, and Standards). Potential impacts associated with water quality or waste discharge violations are presented below.

Impact TWRA-H-1: Construction activities would degrade surface water quality through erosion and sedimentation.

As described in Section 6.2.5 (Construction), construction of a typical wind energy project would include the following activities: grading of roads, turbine pads, and crane pads; grading of substation, O&M building, switching station, materials laydown, and equipment staging areas; and construction of the turbine tower foundations and transformer pads. Excavation would be required for each turbine foundation and, depending upon soil and geotechnical conditions at each turbine site, some blasting may be required for turbine tower foundations and interconnecting trenches. All grading and excavation activities would have the potential to cause water quality degradation resulting from soil disturbance.

Disturbance of soil during construction could result in soil erosion and subsequent water quality degradation through increased turbidity and sediment deposition into local streams. In particular, road construction for both temporary and permanent roadways has the potential to cause soil instability resulting in erosion and sedimentation, which could potentially degrade surrounding water quality. Land disturbance associated with road construction and improvements would include the following activities: removal of vegetation, blade grading, soil compaction, installation of drainage structures and stream crossings, and installation of slope-strengthening structures as needed. These activities involve soil disturbance and stockpiling of earth that could potentially accelerate soil erosion. Exposed and/or eroding sediment could wash into surrounding waterways and their downstream reaches.

This impact would be more likely to occur in the northern areas of the TWRA, due to mountainous terrain and a higher concentration of surface water. In contrast, this impact would be less likely to occur in the southern portion of the TWRA, due to relatively flat or gently sloping terrain and the generally ephemeral nature of surface water.

Mitigation Measures for Impact TWRA-H-1

To prevent rotor and tower failure and avoid potential impacts, the applicants of future wind projects shall design the project to:

TWRA-H-1a **Dry weather construction.** Construction activities shall be conducted during dry weather to the extent feasible; construction shall be scheduled around anticipated precipitation events. If an unexpected precipitation event occurs while construction activities are already underway, construction activities shall be stopped until the precipitation event and subsequent overland flow (if existent) has ceased, unless cessation of construction activities is unsafe or would not reduce the likelihood of erosion and subsequent sedimentation.

TWRA-H-1b **Minimize disturbance to stream channels.** Except as provided below, Project structures shall be placed so as to avoid stream channels (beds and banks). All construction activities shall be conducted in a manner that minimizes disturbance to stream channels, including intermittent and perennial streams, through implementation of Best Management Practices including silt fences, straw waddles, or other erosion control devices. Whenever practicable, construction and maintenance traffic would use existing roads or cross-country access routes (including the ROW) which avoid impacts to the sensitive features. To minimize ground disturbance, construction traffic routes will be clearly marked with temporary markers such as easily visible flagging. Construction routes, or other means of avoidance, must be approved by the appropriate agency or landowner before use. Where it is not feasible for access roads to avoid streambed crossings, such crossings would be built at right angles to the streambeds whenever feasible. In the event that a project structure must be placed within a stream channel (such as a culvert or bridge for an access road stream crossing or placement of a wind turbine structure within a broad, ephemeral, unavoidable desert wash), all required permits shall be obtained through the Lahontan RWQCB or other relevant agency prior to commencement of construction activities.

TWRA-H-1c **Stream crossing construction timing.** In the event that a stream channel cannot be avoided and must be crossed by an access road, all such stream crossings will be constructed during dry or low-flow periods to minimize erosion and sedimentation. Stream banks will be stabilized and/or restored upon completion of the stream crossing construction work.

TWRA-H-1d **Identify and mark sensitive areas for avoidance.** Specific sites as identified by authorized agencies (e.g., fragile watersheds) where construction and maintenance equipment and vehicles are not allowed shall be clearly marked on-site before any construction, maintenance, or surface-disturbing activities begin. Construction and maintenance personnel shall be trained to recognize these markers and understand the equipment movement restrictions involved.

CEQA Significance Conclusion

The following BMPs, which are recommended to be required for all wind development projects within the TWRA, would serve to minimize the potential for construction activities to degrade surface water quality through erosion or sedimentation: TWRA-HYD-1 (Construction SWPPP), and TWRA-HYD-2 (Environmental Training Program). These BMPs are introduced in Section 6.11.3.1 and explained in detail in Table 6.11-2. In addition, implementation of Mitigation Measures TWRA-H-1a (Dry weather construction), TWRA-H-1b (Minimize disturbance to stream channels), TWRA-H-1c (Stream crossing

construction timing), and TWRA-H-1d (Identify and mark sensitive areas for avoidance) would supplement these recommended BMPs and would substantially reduce the potential for water quality degradation by ensuring that construction activities associated with development of the TWRA would occur in dry weather and outside of stream channels and that construction activities involving stream crossings occur during dry or low-flow periods. These measures would minimize the potential for disturbed or stockpiled soil to be carried into nearby streams. Therefore, with the implementation of the mitigation measures described above, Impact TWRA-H-1 would be less than significant (Class II).

Impact TWRA-H-2: Construction activities would degrade water quality through the accidental release of potentially harmful or hazardous materials.

Surface water and groundwater quality could be degraded through the accidental release of hazardous materials during construction activities for wind development projects. Such materials include: lead-based paint flakes, diesel fuel, gasoline, lubricant oils, hydraulic fluid, antifreeze, transmission fluid, lubricant grease, cement slurry, and other fluids required for the operation of construction vehicles and equipment. The preparation and pouring of concrete and the use of motorized equipment are examples of construction activities that would involve the use of potentially harmful materials. Excess concrete could flow away from a turbine foundation site or substation construction site. Motorized equipment could leak hazardous materials such as motor oil, transmission fluid, or antifreeze due to inadequate or improper maintenance, unnoticed or unrepaired damage, improper refueling, or operator error. The release of one or more hazardous materials could occur at tower installation locations, substation construction locations, staging areas, refueling stations, hazardous materials storage areas, and other locations where construction activities would occur.

Surface water could be contaminated through either direct or indirect contact with potentially harmful or hazardous materials. Direct contact with these materials would result from a spill or leak that occurs directly above or within a stream or waterbody. A direct impact from the release of potentially harmful or hazardous materials requires that there be flow present in the stream. As such, direct contamination would be less likely to occur in the southern portion of the TWRA, where surface water is less frequent than in the mountains. An accidental release of a potentially harmful or hazardous material into a dry stream bed or wash would not directly impact water quality. Similarly, an accidental spill or release of hazardous materials outside of a stream channel would not directly impact water quality. However, accidental spills or releases of hazardous materials into a dry stream bed or wash, or outside of a stream channel, could indirectly impact water quality through runoff during a subsequent storm event, when the spilled material would be washed into a stream or waterbody.

Groundwater could be contaminated through direct or indirect contact with potentially harmful or hazardous materials. As described in Section 6.11.1.2, depth to groundwater in the Antelope Valley Groundwater Basin ranges between 100 feet and 500 feet below ground surface (bgs), and in the Fremont Valley Groundwater Basin depth to groundwater is consistently greater than 100 feet bgs. Depth to groundwater information is not available for the Tehachapi Valley East Groundwater Basin or the Kelso Lander Valley Groundwater Basin. The construction-related excavation depth required at each turbine tower site is expected to vary, depending upon the type and size of turbine selected for each project. As mentioned above with regards to Impact TWRA-H-1, blasting may be required for turbine tower foundations and interconnecting trenches. Although it is considered unlikely that such activities would occur deep enough to make direct contact with groundwater, because depth to groundwater is not known for all groundwater basins within the TWRA, it must be considered that direct contact with groundwater could potentially be made. Subsequently, direct contamination of groundwater by potentially harmful or

hazardous materials associated with turbine construction would be possible. Accidental spills or releases of hazardous materials could also indirectly impact groundwater through leaching. Hazardous material spills that are left on the ground surface for an extended period or that are followed quickly by a storm event could leach through the soil and into the groundwater, thereby resulting in the degradation of groundwater quality.

Mitigation Measures for Impact TWRA-H-2

TWRA-H-1a **Dry weather construction.** (See full description under discussion for Impact H-1)

TWRA-H-1b **Minimize disturbance to stream channels.** (See full description under discussion for Impact H-1)

TWRA-H-1c **Stream crossing construction timing.** (See full description under discussion for Impact H-1)

TWRA-H-1d **Identify and mark sensitive areas for avoidance.** (See full description under discussion for Impact H-1)

TWRA-H-2a **Groundwater dewatering and remediation.** Prior to the onset of any excavation or blasting activities, the Project Applicant shall determine the depth to groundwater at all proposed excavation and blasting sites. If it is found that groundwater would be encountered during excavation and/or blasting activities, de-watering of the potentially affected groundwater resources shall occur prior to the onset of excavation or blasting. In addition, the Project Applicant shall also develop and implement a groundwater remediation plan if it is determined that known groundwater resources would be unavoidable during construction and that dewatering would not be possible or effective in avoiding direct contact with groundwater. In the event that unknown groundwater resources are encountered or an unplanned disturbance of known resources occurs, the Project Applicant shall immediately halt the disruptive activity and implement a site-specific remediation plan to avoid and/or contain direct contamination events.

TWRA-H-2b **Groundwater testing and treatment before disposal.** In no case will groundwater removed during construction be discharged to surface waters or storm drains without first obtaining any required permits. If dewatering is necessary, the water will be contained and sampled to determine if contaminants requiring special disposal procedures are present. If the water tests sufficiently clean and land application is determined feasible per requirements of the Lahontan RWQCB, the water shall be directed to relatively flat upland areas for evaporation and infiltration back to the water table, used for dust control, or used as makeup for a construction process (e.g., concrete production). Water determined to be unsuitable for land application or construction use shall be disposed of in another appropriate manner, such as treatment and discharge to a sanitary sewer system in accordance with applicable permit requirements or hauled offsite to an approved disposal facility.

TWRA-H-2c **Inspection and maintenance of vehicle spill kits.** All land-based inspection and maintenance vehicles shall maintain a vehicle hazardous materials spill kit, which shall include absorbent materials, tarps, small storage containers or waterproof bags, and latex gloves. Field personnel shall be made aware of the existence of these spill kits and instructed how to use them.

TWRA-H-2d **No storage of fuels and hazardous materials near sensitive water resources.** Storage of fuels and hazardous materials will be prohibited within 200 feet of groundwater supply wells and within 400 feet of community or municipal wells.

TWRA-H-2e **Proper disposal and clean-up of hazardous materials.** Hazardous materials will not be disposed of onto the ground, the underlying groundwater, or any surface water. Totally enclosed containment will be provided for trash. Petroleum products and other potentially hazardous materials would be removed to a hazardous waste facility permitted or otherwise authorized to treat, store, or dispose of such materials. In the event of a release of hazardous materials to the ground, it will be promptly cleaned up in accordance with applicable regulations.

CEQA Significance Conclusion

The following BMPs, which are recommended to be required for all wind development projects within the TWRA, would serve to minimize the potential for construction activities to degrade surface water quality through the release of hazardous substances: TWRA-HYD-1 (Construction SWPPP), TWRA-HYD-2 (Environmental Training Program), TWRA-HYD-3 (Accidental Spill Control), TWRA-HYD-4 (Non-Stormwater and Waste Management Pollution Controls), TWRA-HYD-5 (Hazardous Material Identification), TWRA-HYD-6 (Excavation and Blasting Site Dewatering Management), TWRA-HYD-8 (Hazardous Materials and Waste Handling Management), and TWRA-HYD-9 (SPCC Plan). These BMPs are provided in Table 6.10-2 (Best Management Practices). In addition, implementation of Mitigation Measures TWRA-H-1a (Dry weather construction), TWRA-H-1b (Minimize disturbance to stream channels), TWRA-H-1c (Stream crossing construction timing), TWRA-H-1d (Identify and mark sensitive areas for avoidance), TWRA-H-2a (Groundwater dewatering and remediation), TWRA-H-2c (Inspection and maintenance of vehicle spill kits), TWRA-H-2d (No storage of fuels and hazardous materials near sensitive water resources), and TWRA-H-2e (Proper disposal and clean-up of hazardous materials) would supplement these recommended BMPs and would substantially reduce the potential for water quality degradation to occur by providing for the timely and effective removal of any hazardous materials spills that may occur, thereby minimizing the likelihood for such materials to migrate to surface or groundwater resources. Therefore, with the implementation of the mitigation measures described above, Impact TWRA-H-2 would be less than significant (Class II).

Impact TWRA-H-3: Operation and maintenance activities would degrade water quality through the accidental release of potentially harmful or hazardous materials.

As described in Section 6.2.6 (Operation), wind turbines that would be installed during development of the TWRA are typically monitored using computers located in the base of each turbine tower. Monitoring also occurs through telecommunication linkages from the O&M facility associated with each wind farm. On-site operations and maintenance activities would include the periodic replacement of lubricants and hydraulic fluids contained within each turbine, and the regular inspection of roads, tower foundations, and trenched areas. Surface and groundwater quality could potentially be degraded through the accidental release of harmful or hazardous materials during operational and maintenance activities such as those described above.

Due to the use of vehicles and other motorized equipment during operations and maintenance, some of the potentially hazardous substances that could be released include: diesel fuel, gasoline, lubricant oils, hydraulic fluid, antifreeze, transmission fluid, and lubricant grease. Lubricants and hydraulic fluids would also be potentially harmful or hazardous if a release were to occur during replacement of the fluids, as required per normal maintenance. These materials could contaminate surface water through direct contact

with water in a stream channel or through runoff to local streams. Groundwater resources could be affected if the hazardous material were left on the ground surface for an extended period of time and allowed to leach into the groundwater. There are multiple federal, State, and local agencies and bodies of law with authority over the mitigation of hazardous materials spills. The specific authority over a spill depends on multiple factors such as the location and nature of the spill.

In contrast with construction activities, which would include more intensive use of heavy equipment for longer periods of time, operation of wind projects would include activities with substantially less potential to result in water quality degradation from the accidental spill of hazardous materials.

Mitigation Measures for Impact TWRA-H-3

TWRA-H-1d **Identify and mark sensitive areas for avoidance.** (See full description under discussion for Impact TWRA-H-1)

TWRA-H-2c **Inspection and maintenance of vehicle spill kits.** (See full description under discussion for Impact TWRA-H-2)

TWRA-H-2d **No storage of fuels and hazardous materials near sensitive water resources.** (See full description under discussion for Impact TWRA-H-2)

TWRA-H-2e **Proper disposal and clean-up of hazardous materials.** (See full description under discussion for Impact TWRA-H-2)

CEQA Significance Conclusion

BMP TWRA-HYD-4 (Non-Stormwater and Waste Management Pollution Controls), which is recommended to be required for all wind development projects within the TWRA, would serve to minimize the potential for operational activities to degrade surface water quality through the release of hazardous substances. This BMP is introduced in Section 6.11.3.1 and explained in detail in Table 6.11-2. In addition, implementation of Mitigation Measures TWRA-H-1d (Identify and mark sensitive areas for avoidance), TWRA-H-2c (Inspection and maintenance of vehicle spill kits), TWRA-H-2d (No storage of fuels and hazardous materials near sensitive water resources), and TWRA-H-2e (Proper disposal and clean-up of hazardous materials) would supplement this recommended BMP and would substantially reduce the potential for surface or ground water quality degradation through the accidental release of potentially harmful or hazardous materials. These mitigation measures would minimize the potential for an accidental release of potentially harmful materials and would ensure the timely and effective clean-up of any such spill, if one should occur, thereby minimizing the potential for harmful substances to migrate to surface waterways or leach into underlying groundwater. Therefore, with the implementation of the identified mitigation measures, Impact TWRA-H-3 would be less than significant (Class II).

Depletion of Groundwater Supplies or Interference with Groundwater Recharge (Criterion TWRA HYD2)

Projects associated with development of the TWRA would result in an impact to Hydrology and Water Quality under Criterion TWRA HYD2 if associated construction, maintenance, or decommissioning activities would require a substantial supply of local groundwater resources or would obstruct existing groundwater recharge rates, for instance through the creation of substantial new impermeable areas. Such effects could result in a net deficit in aquifer volume or lowering of local groundwater table/s; for instance, the production rate of existing wells may drop to a level that would not support existing land uses or planned uses for which permits have been granted. The expected likelihood of such events to occur is described below.

Should groundwater be encountered during construction-related excavation and/or blasting activities, dewatering would be expected to occur at the site, in compliance with Mitigation Measure TWRA-H-2a (Groundwater Dewatering and Remediation Plan), as identified under Impact TWRA-H-2 (Construction activities would degrade water quality through the accidental release of potentially harmful or hazardous materials). Dewatering during wind turbine construction and trenching activities could result in a local and temporary drawdown of groundwater levels which could temporarily reduce the yield of nearby water supply wells. However, as described under Impact TWRA-H-2, depth to groundwater in the TWRA is generally understood to be greater than 100 feet bgs and as such, it is unlikely that dewatering measures will be necessary during wind development of the area. Furthermore, in the case that dewatering is necessary, it is not expected that such activities associated with the types of wind development projects that would occur within the TWRA would be extensive or would result in the depletion of groundwater supplies.

During construction of wind energy projects within the TWRA, it is expected that a water source will be required for the following temporary purposes: dust control measures (during grading activities, road construction, and clearing of vegetation), mixing of concrete (for wind tower foundations and substations), and drinking water for construction crew. Water used during construction or operation of wind development projects would be trucked in from off-site (outside the TWRA) or obtained from local groundwater wells of surface water bodies near the construction site. Any use of local groundwater or surface water supplies would be in full compliance with requirements of the Lahontan RWQCB and is therefore not expected to result in depletion of local water supplies. Furthermore, due to the nature of wind farms and the type of infrastructure involved, and considering that development of the TWRA is expected to occur over a long period of time, any required amount of water would be minimal and would not result in the long-term depletion of groundwater supplies.

Creation of new impervious surfaces could interfere with groundwater recharge by reducing the amount of surface area through which precipitation and surface water percolates to underground aquifers. Impervious areas and compacted soils generally have higher runoff coefficients than natural areas. Impervious surfaces that would result from development of the TWRA would include turbine tower foundations, concrete pads beneath various substation elements, such as transformer banks, and paved or sealed access roads. These project features may result in small local increases in runoff, but considering the total size of the TWRA, the total area affected by turbine tower foundations and substation elements would be minimal. The concrete tower foundations and concrete pads beneath various substation elements would cover very small areas and would be distributed over a large geographic region, and therefore would not substantially interfere with groundwater recharge. Any small increase in runoff would be localized and would not result in an appreciable impact to groundwater recharge.

No depletion of groundwater supplies or considerable interference with groundwater recharge would result through development of the TWRA. No impact would occur.

Siltation or Erosion through Alteration of Existing Drainage Pattern (Criterion TWRA HYD3)

Wind development projects that are expected to occur in the TWRA would result in an impact to Hydrology and Water Quality under Criterion TWRA HYD3 if associated construction, maintenance, or decommissioning activities would substantially alter the existing drainage pattern of a site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on site or off site.

Impact TWRA-H-4: Project structures would cause erosion, sedimentation, or other flood-related damage by impeding flood flows.

Encroachment of a turbine tower or other wind development infrastructure into a stream channel or floodplain, including FEMA-designated Flood Hazard Areas, could result in flooding of or erosion damage to the encroaching structure, diversion of flows and increased flood risk for adjacent property, or increased erosion on adjacent property. This impact is likely to occur only where wind towers or other permanent project features are constructed in or closely adjacent to a watercourse. With the exception of very wide and undefined desert washes, as may be found in the southern portion of the TWRA, it is not expected that infrastructure associated with wind development would be placed in an existing stream channel. Placement of wind turbine towers in an existing watercourse is particularly unlikely because it is expected that such towers would be sited along hill tops, ridges, and in raised areas where optimum wind conditions exist. However, access or spur roads leading to turbine tower sites may be required to traverse multiple waterways in the TWRA (which are portrayed in Figure 6.11-2). Considering the high occurrence of ephemeral streams throughout the TWRA, it is likely that some roadways required for future wind development projects would traverse ephemeral waterways. In addition, as shown in Figure 6.11-1, there are several FEMA-designated Flood Hazard Areas in the TWRA. At this time, it is not known exactly how development of the TWRA would be distributed through the region and therefore it is assumed that some infrastructure associated with wind development in the TWRA could be situated within an identified Flood Hazard Area.

Mitigation Measures for Impact TWRA-H-4

TWRA-H-1b **Minimize disturbance to stream channels.** (See full description under discussion for Impact TWRA-H-1)

TWRA-H-1d **Identify and mark sensitive areas for avoidance.** (See full description under discussion for Impact H-1)

TWRA-H-4 **Tower design for natural drainage.** All turbine towers structures shall be designed and engineered to facilitate natural drainage patterns in order to minimize or avoid any potential erosion, sedimentation or other flood related impacts through the impoundment or redirection of flood flows.

CEQA Significance Conclusion

BMP TWRA-HYD-7 (Flood and Erosion Structure Damage Protection), which is recommended to be required for all wind development projects within the TWRA, would serve to minimize the potential for project structures to cause erosion, sedimentation, or other flood-related damage. This BMP is introduced in Section 6.11.3.1 and explained in detail in Table 6.11-2. In addition, implementation of Mitigation Measures TWRA-H-1b (Minimize disturbance to stream channels), TWRA-H-1d (Identify and mark sensitive areas for avoidance), and TWRA-H-4 (Tower design for natural drainage) would supplement this recommended BMP and would substantially reduce the potential for damage due to flooding or erosion of an encroaching structure, diversion of flood flows and increased flood risk for adjacent property, or increased erosion on adjacent property through careful design and placement of permanent project facilities. Because these measures would minimize the potential for damage due to flooding or erosion of either the encroaching structure or adjacent property, Impact TWRA-H-4 would be reduced to a less-than-significant level (Class II).

Flooding through Alteration of Existing Drainage Pattern or Increased Rate or Amount of Surface Runoff (Criterion TWRA HYD4)

Projects associated with development of the TWRA would result in an impact to Hydrology and Water Quality under Criterion TWRA HYD4 if associated construction, maintenance, or decommissioning activities would substantially alter the existing drainage pattern of a site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on site or off site.

As described above under Impact TWRA-H-4 (Project structures would cause erosion, sedimentation, or other flood-related damage by impeding flood flows) for Criterion TWRA HYD3, projects associated with development in the TWRA would not be expected to substantially alter existing drainage patterns through the encroachment of turbine towers or other infrastructure into a stream channel or floodplain, including the FEMA-designated Flood Hazard Areas identified within the TWRA. However, if the placement of such towers or infrastructure were to substantially increase the rate or amount of surface water runoff in a particular area, it could potentially result in flooding on site or off site.

The amount of surface runoff in any given area is determined by multiple factors, including the following: amount of precipitation; amount of other imported water that enters a watershed; amount of evaporation that occurs in the watershed; and amount of precipitation and imported water that infiltrates to the groundwater. In addition, the rate of surface runoff is largely determined by topography and the storm hydrograph (the intensity of rainfall over a given period of time). Wind development of the TWRA would have no effect on precipitation, evaporation, or the storm hydrograph. Construction of wind projects in the TWRA may require the temporary import of water for construction needs such as dust control measures and concrete mixing, but water used for such purposes would not contribute to or affect the existing characteristics of surface runoff.

Although construction of wind projects in the TWRA would not alter the overall topography, such development would be expected to introduce location-specific changes, such as grading at turbine tower locations, new and/or expanded substations, and along access and spur roads. This ground disturbance would be spread over a large geographic area and would not alter the overall topography of the TWRA. As described under Criterion TWRA HYD2, new impervious surfaces that would result from development of the TWRA are expected to include concrete tower foundations, concrete pads beneath various substation elements, and paved or sealed access roads. Concrete tower foundations and concrete pads beneath various substation elements would cover very small areas and would be distributed over a large geographic region, and therefore would not substantially interfere with groundwater infiltration. Any increase in surface water runoff resulting from permanent project features would be minor and location-specific, and would not influence surface runoff in a manner which would result in flooding on site or off site. No impact would occur.

Exceedance of Stormwater Drainage System Capacity or Substantial Increases Polluted Runoff (Criterion TWRA HYD5)

Projects associated with development of the TWRA would result in an impact to Hydrology and Water Quality under Criterion TWRA HYD5 if associated construction, maintenance, or decommissioning activities would 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.

As described under Criterion TWRA HYD2, approximately five percent (or less) of the entire area required for a utility-scale wind plant would actually be occupied by turbines, access roads, and other equipment, with 95 percent of the total area remaining undeveloped. In addition, as described under Criterion TWRA HYD4, any increase in surface water runoff resulting from permanent project features associated with wind development of the TWRA would be minor and location-specific. Although the specific location of turbine towers, access roads, and other infrastructure associated with wind development of the TWRA is currently unknown, it is reasonably assumed that no more than five percent of the total land area within the TWRA would be occupied by permanent project features and, per the discussion provided under Criterion TWRA HYD4, that such project features would not have a notable contribution to increased stormwater runoff. As such, it is not expected that development of the TWRA would create or contribute runoff water with the potential to exceed the capacity of stormwater drainage systems and nor would such development provide substantial additional sources of polluted runoff. No impact would occur.

Degradation of Water Quality (Criterion TWRA HYD6)

Projects associated with development of the TWRA would result in an impact to Hydrology and Water Quality under Criterion TWRA HYD6 if associated construction, maintenance, or decommissioning activities would cause substantial degradation of water quality through a means by which has not been addressed under the preceding Significance Criteria for Hydrology and Water Quality. As discussed under Criterion TWRA HYD1 (Water Quality or Waste Discharge Violations), development of the TWRA could result in impacts to water quality through the creation of erosion and sedimentation, or through the accidental release of potentially harmful or hazardous materials. No additional sources of water quality degradation associated with development of the TWRA have been identified. No impact would occur under Criterion TWRA HYD6.

Housing within a 100-Year Flood Hazard Area (Criterion TWRA HYD7)

As described in Section 6.11.1.2, Flood Hazard Areas, also known as "100-year floodplains" are defined by FEMA. Figure 6.11-1 shows that several Flood Hazard Areas have been identified within the TWRA. According to FEMA, any development that takes place in a Flood Hazard Area must comply with floodplain management ordinances. (FEMA, 2005) However, the type of projects that would be associated with development of the TWRA would not include residential or housing projects and therefore, development of the TWRA would not result in the placement of housing in a Flood Hazard Area. No impact would occur.

Impedance or Redirection of Flood Flows within a 100-Year Flood Hazard Area (Criterion TWRA HYD8)

As discussed under Impact TWRA-H-4 (Project structures would cause erosion, sedimentation, or other flood-related damage by impeding flood flows), projects associated with full development of the TWRA could result in the placement of permanent infrastructure within an identified Flood Hazard Area. Mitigation associated with Impact TWRA-H-4 would include the use of tower design features to minimize potential flooding impacts associated with turbine tower placement in a Flood Hazard Area. Projects associated with full development of the TWRA are not expected to impede or redirect flood flows within identified Flood Hazard Areas. No impact would occur.

Risk of Loss, Injury, or Death through Dam Failure (Criterion TWRA HYD9)

Projects associated with development of the TWRA would result in an impact to Hydrology and Water Quality under Criterion TWRA HYD6 if associated construction, maintenance, or decommissioning activities would 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.

There are no major levees or dams within the TWRA, and the types of projects associated with development of the TWRA would not have the potential to cause the failure of a levee or dam. Although the TWRA is situated within the same watershed area as a levee or dam, such as Antelope Dam in the Grapevine HU, no project features associated with development of the TWRA would be located adjacent to a levee or dam. Furthermore, projects associated with development of the TWRA would not, in any way, create or contribute to water volume in a lake or reservoir to a degree that could cause mechanical stresses on the dam or levee containing such volume. Development of the TWRA would not have the potential to expose people or structures to flooding as a result of failure of a levee or dam. No impact would occur.

Damage from Inundation by Seiche, Tsunami, or Mudflow (Criterion TWRA HYD10)

Projects associated with development of the TWRA would result in an impact to Hydrology and Water Quality under Criterion TWRA HYD6 if associated construction, maintenance, or decommissioning activities would result in or be subject to inundation by seiche, tsunami, or mudflow. Each of these three natural hazards and their associated risk relevant to development of the TWRA are described below:

A tsunami is a wave generated in a large body of water (typically the ocean) by fault displacement or major ground movement. The TWRA is not situated near the coast and would therefore not be subject to any tsunami hazards.

A seiche is a large wave generated in an enclosed body of water in response to ground shaking. The TWRA is not located within a dam inundation area or within the inundation area for any other natural body of water and would therefore not be subject to seiche hazards.

Mudflows are a type of mass wasting or landslide, where earth and surface materials are rapidly transported downhill under the force of gravity. Mudflow events are caused by a combination of factors, including soil type, precipitation, and slope. Mudflow may be triggered by heavy rainfall that the soil is not able to sufficiently drain or absorb. As a result of this super-saturation, soil and rock materials become unstable and eventually slide away from their existing location.

Impact TWRA-H-5: Project structures would be inundated by mudflow.

As discussed in Section 6.11.1.2 (Regional Setting), topography varies through the TWRA, from characteristically high desert terrain in the southern portion to mountainous terrain in the northern portion. Some areas of the TWRA may be conducive to mudflow events, particularly on steep slopes with unstable soils in the more mountainous terrain of the northern TWRA. At this time, it is not known exactly how development of the TWRA would be distributed through the region, or exactly where wind turbine towers and other infrastructure would be located within the TWRA and therefore, it is assumed that some infrastructure associated with wind development in the TWRA could be subject to inundation by mudflow.

Mitigation Measures for Impact TWRA-H-5

TWRA-H-1a **Dry weather construction.** (See full description under discussion for Impact H-1)

CEQA Significance Conclusion

BMP TWRA-HYD-7 (Flood and Erosion Structure Damage Protection), which is recommended to be required for all wind development projects within the TWRA, would serve to minimize the potential for project structures to result in damage from inundation by mudflow. This BMP is introduced in Section 6.11.3.1 and explained in detail in Table 6.11-2. In addition, implementation of Mitigation Measure TWRA-H-1a (Dry weather construction) would supplement this recommended BMP and would substantially reduce the potential for inundation by mudflow during construction of wind projects in the TWRA by avoiding construction during precipitation events, which is one of the main factors that influence a mudflow event. Additionally, the likelihood of mudflow is increased during construction activity due to disturbed and/or stockpiled soil areas. By avoiding construction activity during precipitation events, the potential for inundation by mudflow is substantially reduced. Therefore, with the implementation of this mitigation measure, Impact TWRA-H-5 would be less than significant (Class II).

6.12 Land Use and Planning

This section addresses the potential Land Use and Planning impacts of expected and potential wind development in the TWRA. A description of the Affected Environment for Land Use and Planning is presented below in Section 6.12.1, followed by a description of Applicable Laws, Regulations, and Standards in Section 6.12.2, and the Impact Analysis presented in Section 6.12.3.

6.12.1 Affected Environment

The TWRA is located in the southern portion of Kern County. The TWRA is comprised of a large area directly west of the community of Mojave, north of the Los Angeles County boundary line and east of the community of Tehachapi. There are existing wind farms scattered throughout the TWRA. The southern portion of the TWRA contains flat land of the Antelope Valley which becomes much steeper going north toward the Tehachapi Mountains. A majority of the TWRA is located in the mountainous area of the Tehachapi Mountains. There are very limited residential uses and most of these are in the southern portion of the TWRA. While there is no dense residential development directly within in the TWRA, there are established residential communities nearby in Mojave and Tehachapi. The northern portion of the TWRA is essentially undeveloped and contains a combination of private and federally owned lands administered by the BLM. Some cattle grazing occurs in the northern portion of the TWRA. The southern portion contains a mix of undeveloped lands, industrial uses, agricultural uses and some scattered residential. The Pacific Crest National Scenic Trail runs generally through the middle of the TWRA. There is a radar testing facility owned by Northrop Grumman west of the southern portion of the TWRA.

Generally, the TWRA consists of lands that are zoned for Agricultural uses (A), Heavy Industrial (M) and Estate (E) uses. Parcels throughout the TWRA that are zoned AG and currently in agricultural use may be in agricultural preserve contracts pursuant to the Williamson Act. In the southern portion of the TWRA, there are some parcels zoned as Platted Lands (PL) and Open Space (OS) as well. As described in Section 6.2, for purposes of this analysis, parcels zoned as PL are excluded from potential wind development within the TWRA. Combining Districts such as the Residential Suburban (RS) overlay applies to some parcels zoned as Estate and Platted Land within the TWRA. The base zoning designations of A, M and E allow for the Wind Energy (WE) Combining District to be applied to any parcels proposed for wind

development, therefore allowing wind turbines on-site. It is assumed that any wind development within the TWRA subject to Kern County's jurisdiction would occur on parcels that would allow for the WE Combining District to apply. If projects are proposed on lands zoned otherwise, then an application for a zone change will be required in order to allow for the WE Combining District.

Alta Wind Project

The proposed Alta Wind project is located in the south western portion of the TWRA. The Alta Wind Project area is comprised of several parcels adjacent to existing wind farms and industrial uses such as the California Portland Cement Company plant. There are wind turbines located to the north of the proposed Alta Wind Project area off Oak Creek Road and off Tehachapi Willow Spring Road. The parcels generally appear to be undeveloped and mostly on flat land with the exception of parcels located near the Tehachapi Mountains. There is no dense residential development located directly in the Alta Wind Project area.

The parcels associated with the proposed Alta Wind Project are generally zoned for Agricultural uses (A), Heavy Industrial (M) and Estate (E) uses. Combining Districts such as the Residential Suburban (RS) overlay applies to some parcels zoned for Estate uses. The RS district allows for the expansion of permitted domestic agricultural uses in rural residential areas. The base zoning designations of A, M and E allow for the Wind Energy (WE) Combining District to be applied to the subject parcels, therefore allowing wind turbines on-site.

6.12.2 Applicable Regulations, Plans, and Standards

6.12.2.1 Federal

Certain parcels within the northern portion of the TWRA are owned by the Bureau of Land Management (BLM). If wind development is proposed in these areas, development must be consistent with relevant plans such as the proposed West Mojave Plan. If any proposed project require crossing through public lands (access roads, etc), a project applicant would need to acquire a BLM right-of way grant.

6.12.2.2 State

Activities associated with development of the TWRA (including the proposed Alta Wind Project) would be subject to the same State requirements as would the proposed TRTP. The State regulatory requirements are presented in Section 3.2 (Agricultural Resources).

6.12.2.3 Local

Kern County

Land use and planning decisions within the TWRA (including the proposed Alta Wind Project) are guided and regulated by the Kern County General Plan and the Kern County Zoning Ordinance. The General Plan contains goals, objectives, and policies and provides an overall foundation for establishing land use patterns. For this land use impact analysis, this section lists all relevant goals, objectives, policies, and implementation measures related to development of the TWRA (including the proposed Alta Wind Project).

The Zoning Ordinance contains regulations through which the General Plan's provisions are implemented. The most relevant regulations pertaining to wind energy development are presented below.

Kern County General Plan

The State of California Government Code 65300 requires Kern County to prepare and adopt a general plan. The Kern County General Plan was recently revised and was approved on June 15, 2004. Its purpose is to give long-range guidance to county officials making decisions affecting the growth and resources of unincorporated Kern County. The Kern County General Plan helps to ensure that day-to-day planning and land use decisions are in conformance with the long-range program designed to protect and further the public interest. It will be periodically reviewed and updated as the goals and requirements of the community evolve and change (Kern County, 2004a).

6.12.3 Impact Analysis

This section explains how potential impacts to Land Use and Planning associated with development of the TWRA (including the proposed Alta Wind Project) are assessed. Section 6.12.3.1 presents the significance criteria upon which impact determinations are based. This section also briefly describes the methodology for determining the type and degree of impact that would be produced as a result of TWRA development. All impacts and mitigation measures identified for development of the TWRA are presented in Section 6.12.3.2.

6.12.3.1 Criteria for Determining Impact Significance

Impact significance is assessed based on criteria derived from the Kern County Initial Study Checklist. Land Use impacts would be considered significant if activities or actions associated with development of the TWRA (including the proposed Alta Wind Project) would:

- Criterion TWRA LU1: Physically divide an established community
- Criterion TWRA LU2: Conflict with any applicable Land Use Plan, Policy, or Regulation
- Criterion TWRA LU3: Conflict with any applicable Habitat Conservation Plan or Natural Community Conservation Plan

6.12.3.2 Impacts and Mitigation Measures

The following section describes potential impacts and mitigation measures related to Land Use that could occur as a result of development of the TWRA (including the proposed Alta Wind Project). A summary of identified impacts and associated mitigation measures for the TWRA is presented in Table 6.20-1.

Physically Divide an Established Community (Criterion TWRA LU1)

The TWRA is located in an area with existing wind farms. There are very limited residential uses and mostly in the southern portion of the TWRA and therefore a lack of an established community. Additionally, wind development would be in-line with existing uses in the area and therefore no significant impacts related to physically dividing an established community would occur.

Conflict with any applicable Land Use Plan, Policy, or Regulation (Criterion TWRA LU2)

Impact TRWA-LU-2: Future wind development may conflict with an applicable Land Use Plans, Policies, or Regulations.

The Kern County General Plan, Energy Element, encourages wind development in appropriately zoned areas. The TWRA contains many parcels with varying zoning designations. If an individual project is proposed on parcels that are not zoned to allow for the WE combining district, then an application for a zone change would need to be submitted to Kern County. The individual project application would then be

subject to the approval of Kern County. Each project will be subject to CEQA review which includes an analysis of Land Use conflicts; therefore, wind development of the TWRA is not expect to result in significant, unmitigable land use impacts.

Mitigation Measure for Impact TWRA-LU-2

TWRA-LU-1: If a proposed project within the TWRA requires a zone change to allow for the WE Combining District, then each individual project applicant shall submit the final project design in plot plans for review and approval by the Kern County Planning Department. The Planning Department will confirm that final facility locations do avoid sensitive resources, hazard zones identified, and is consistent with the County's General Plan and Zoning Ordinance, unless otherwise approved by the Kern County Planning Director. In its final review, the Planning Department must confirm that an individual project's facilities are installed only within the area surveyed for environmental resources and that the facilities are sited in areas and in the appropriately zoned and approved areas.

CEQA Significance Conclusion

With implementation of Mitigation Measure TWRA-LU-2, any impacts related to conflicts with applicable land use plans can be mitigated to less than significant levels (Class II).

Conflict with any Applicable Habitat Conservation Plan or Natural Community Conservation Plan (Criterion TWRA LU3)

The West Mojave Plan (WMP) may potentially apply to the TWRA. The desert tortoise and Mohave ground squirrel among other local sensitive species would be protected under this Plan; however, the plan has not been approved yet and currently does not apply to non-federal lands. Construction of and operations of each individual project within the TWRA and on federal lands would currently be subject to siting outside of any protected areas so as not to conflict with any applicable Conservation or Natural Community Conservation Plan. Therefore, significant land use impacts would not occur due to the wind development in the TWRA. The Biological Resources analysis of the TWRA discusses impacts to specific threatened and endangered species that would be protected under such plans within the TWRA. See Biological Resources Section 6.7 and Criterion TWRA BIO6 for additional discussion regarding the West Mojave Plan.

The habitat conservation plan portion of the WMP has not been completed and would require greater specificity for local governments to obtain incidental take permits under the State and Federal endangered species acts. As the specific provisions of the WMP that will be adopted are unknown at this time, and project-specific information is also unknown, it is impossible to determine whether future wind development projects will conflict with the WMP. However, it is assumed that projects would be required to comply with the WMP as a condition of their approval. No impact would occur.

6.13 Mineral Resources

This section addresses the potential Mineral Resources impacts of expected and potential wind development in the TWRA. A description of the Affected Environment for Mineral Resources is presented below in Section 6.13.1, followed by a description of Applicable Laws, Regulations, and Standards in Section 6.13.2, and the Impact Analysis presented in Section 6.13.3.

6.13.1 Affected Environment

The collection of mineral resource data involves gathering information regarding the historic and existing occurrence of mineral resources and mining production within the TWRA. The type of information gathered includes the following: the type of minerals commonly found in the study area; the location of mining operations; the occurrence of oil and gas in the study area, and regulatory requirements with respect to mineral resources.

Seven percent of the nation's non-fuel mineral production comes from California (Kohler, 2006). Within the TWRA, the California Department of Conservation (DOC) identified silica, limestone and gold as principal minerals during the period of 1990-2000 (DOC, 2008). Each is defined below by the U.S. Geological Survey:

> Industrial sand and gravel, often called "silica," "silica sand," and "quartz sand," includes sands and gravels with high silicon dioxide (SiO2) content. These sands are used in glassmaking; for foundry, abrasive, and hydraulic fracturing applications; and for many other industrial uses. The specifications for each use vary, but silica resources for most uses are abundant. In almost all cases, silica mining uses open pit or dredging mining methods with standard mining equipment. Except for temporarily disturbing the immediate area while mining operations are active, sand and gravel mining usually has limited environmental impact.
>
> Limestone is considered a dimension stone, and can be defined as natural rock material quarried for the purpose of obtaining blocks or slabs that meet specifications as to size (width, length, and thickness) and shape. Color, grain texture and pattern, and surface finish of the stone are normal requirements. Durability (essentially based on mineral composition and hardness and past performance), strength, and the ability of the stone to take a polish are other important selection criteria. Although a variety of igneous, metamorphic, and sedimentary rocks are used as dimension stone, the principal rock types are granite, limestone, marble, sandstone, and slate.
>
> Gold has been treasured since ancient times for its beauty and permanence. Most of the gold that is fabricated today goes into the manufacture of jewelry. However, because of its superior electrical conductivity and resistance to corrosion and other desirable combinations of physical and chemical properties, gold also emerged in the late 20th century as an essential industrial metal. Gold performs critical functions in computers, communications equipment, spacecraft, jet aircraft engines, and a host of other products. Although gold is important to industry and the arts, it also retains a unique status among all commodities as a long-term store of value. Until recent times, it was considered essentially a monetary metal, and most of the bullion produced each year went into the vaults of government treasuries or central banks (USGS, 2008).

In addition, Table 6.13-1 lists the active and historic mines in the study area, which includes aggregates and silver. Aggregate minerals are defined by the California Geological Survey (CGS) as alluvial sand and gravel or crushed stone that meets standard specifications for use in Portland cement concrete or asphalt concrete. Portland cement is California's second largest mineral commodity and was valued at nearly $1.3 billion in 2006 (Kohler, 2006). Finally, silver has been used for thousands of years as ornaments and utensils, for trade, and as the basis for many monetary systems. Silver also has many industrial applications such as in mirrors, electrical and electronic products, and photography, which is the largest single end use of silver. Silver's catalytic properties make it ideal for use as a catalyst in oxidation reactions; for example, the production of formaldehyde from methanol and air by means of silver screens or crystallites containing a minimum 99.95 weight-percent silver (USGS, 2008).

Table 6.13-1 Permitted and Historic Mines

County Mine ID	Material	Operator	Status
Calcite	Limestone	California Portland Cement	Idle
Summit Lime	Limestone	Summit Lime Co.	Reclaiming
Shumaker Mine	Decomposed Granite	CALEX Engineering Co.	Abandoned
Mojave Quarry	Limestone	California Portland Cement	Active
Cactus Queen	Silica (tailings)	California Portland Cement	Reclaiming
Shumake Operations	Gold, Silver	Cactus Gold Mines	Active
Mojave Mine	Aggregates	Asphalt Construction Co.	Active
Mojave Quarry	Aggregates	Hemperly & Warnack	Not Yet in Operation
Soledad Mountain	Gold, Silver, Aggregates	Golden Queen Mining Co.	Idle
Standard Hill Mine	Gold, Silver, Aggregates	Granite & Billiton Minerals USA	Active & Reclaiming
Got Rocks	Aggregates	Homer Hansen	Idle
Bobtail	Gold, Silver	N/A	Historic
Golden Queen	Gold	N/A	Historic
Gravel Pit	Aggregate	N/A	Historic
Unidentified	N/A	N/A	Historic

Source: Kern County Interactive Mapping- http://www.co.kern.ca.us/gis/

Figure 6.13-1 identifies the county's permitted and historic mines within the TWRA. Table 6.13-1 provides an outline of each mine's content and status.

According to maps provided by the California DOC Division of Oil, Gas and Geothermal Resources (DOGGR), the oil resources in the TWRA consist of plugged and abandoned oils wells (DOGGR, 2008).

Alta Wind Project

The setting described above for the programmatic analysis also applies to the Alta Wind Project. The Alta Wind Project is a proposal to develop up to 800 MW of wind energy in the southern portion of the TWRA. The development would consist of up to 320 high-yield wind turbines.

Figure 6.13-1 maps the proposed Alta Wind Project site, and the following permitted mines are located within approximately three miles of the Alta Wind Project site: Schumaker Mine, Mojave Quarry, Mojave Mine, Mojave Quarry, Soledad Mountain, Standard Hill, Schumaker Operations, and Cactus Queen.

6.13.2 Applicable Laws, Regulations, and Standards

The following section presents the federal, state, regional and local regulations, plans, and standards that are directly applicable to mineral resources in the TWRA (including the proposed Alta Wind Project).

6.13.2.1 Federal

Bureau of Land Management (BLM) – Surface Management Program

Certain parcels with the northern portion of the TWRA are owned by BLM. The BLM Surface Management Program specifies authorization and permitting of mineral exploration, mining, and reclamation actions on the public lands administered by BLM. It is mandated by section 302(b) of FLPMA (43 USC 1732[b] and 603[c]; 43 CFR 3802 and 43 CFR 3809). All operations of any nature that disturb the surface of the mining claim or site require authorization. The necessary authorizations and permits are obtained through the proper BLM field office. The BLM regulations establish three levels of authorization, (1) casual use, (2) notice level, and (3) plans of operations. Casual use involves minor

activity with hand tools, no explosives, and no mechanized earth moving equipment. No permit is required. Notice level activities involve use of explosives and/or earth moving equipment. The total annual unreclaimed surface disturbance must not exceed 5 acres per calendar year. A plan of operations is required for all other surface disturbance activities. A full environmental assessment and reclamation bonding are required.

6.13.2.2 State

Surface Mining Control and Reclamation Act of 1975

Article 6. Mineral Resource Management Policies
§ 3676. Mineral Resource Management Policies.

Lead agency mineral resource management policies adopted pursuant to the provisions of the Public Resources Code (PRC) Section 2762 shall include but not be limited to, the following:

(a) A summary of the information provided by the classification and/or designation reports, or incorporation of PRC Sections 2710 et seq., and state policy by reference, together with maps of the identified mineral deposits or incorporation by reference of the classification and/or designation maps provided by the Board.

(b) Statements of policy in accordance with the provisions of PRC Section 2762(a).

(c) Implementation measures that shall include:

(1) Reference in the general plan of the location of identified mineral deposits, and a discussion of those areas targeted for conservation and possible future extraction by the lead agency.

(2) Use of overlay maps or inclusion of information on any appropriate planning maps to clearly delineate identified mineral deposits and those areas targeted by the lead agency for conservation and possible future extraction.

(3) At least one of the following:

(A) Use of special purpose overlay zones, mineral resource/open space zoning, or any other appropriate zoning that identifies the presence of identified mineral deposits and restricts the encroachment of incompatible land uses in those areas that are to be conserved.

(B) Record, on property titles in the affected mineral resource areas, a notice identifying the presence of identified mineral deposits.

(C) Impose conditions upon incompatible land uses in and surrounding areas containing identified mineral deposits for the purpose of mitigating the significant land use conflicts prior to approving a use that would otherwise be incompatible with mineral extraction.

6.13.2.3 Local

Kern County General Plan

Land Use, Open Space, and Conservation Element

AUTHORITY AND PURPOSE
General Code 65302(d):

A conservation element for the conservation, development, and utilization of natural resources including water and its hydraulic force, forests, soils, river, and other waters, harbors, fisheries, wildlife, minerals, and other natural resources. That portion of the conservation element, including waters, shall be developed in coordination with any Countywide water agency and with all district and city agencies which have developed, served, controlled or conserved water for any purpose for the County or city for which

the plan is prepared. Coordination shall include the discussion and evaluation of any water supply and demand information described in Section 65352.5, if that information has been submitted by the water agency to the city or County.

Government Code 65560:

(b) "Open-space land" is any parcel or area of land or water which is essentially unimproved and devoted to an open-space use as defined in this section and which is designated on a local, regional, or State open-space plan as any of the following:

> (2) Open space used for the managed production of resources, including but not limited to, forest lands, rangeland, agricultural lands, and areas of economic importance for the production of food or fiber; areas required for recharge of groundwater basins; bays, estuaries, marshes, rivers, and streams which are important for the management of commercial fisheries; and areas containing major mineral deposits, including those in short supply.

GOALS: RESOURCE

1. To contain new development within an area large enough to meet generous projections of foreseeable need, but in locations which will not impair the economic strength derived from the petroleum, agriculture, rangeland, or mineral resources, or diminish the other amenities which exist in the County.

2. Protect areas of important mineral, petroleum, and agricultural resource potential for future use.

3. Ensure the development of resource areas minimize effects on neighboring resource lands.

POLICIES: RESOURCE

14. Emphasize conservation and development of identified mineral deposits.

15. Agriculture and other resource uses will be considered a consistent use in areas designated for Mineral and Petroleum Resource uses on the General Plan.

17. Lands classified as MRZ-2, as designated by the State of California, should be protected from encroachment of incompatible land uses.

25. Discourage incompatible land use adjacent to Map Code 8.4 (Mineral and Petroleum) areas.

IMPLEMENTATION MEASURES: RESOURCE

H. 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.

K. 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).

MAP PROVISIONS: RESOURCE

Map Code 8.4 (Mineral and Petroleum) - Areas which contain producing or potentially productive petroleum fields, natural gas, and geothermal resources, and mineral deposits of regional and Statewide significance. Uses are limited to activities directly associated with the resource extraction. Minimum parcel size is five acres gross.

Uses shall include, but are not limited to, the following: Mineral and petroleum exploration and extraction, including aggregate extraction; extensive and intensive agriculture; mineral and petroleum processing (excluding petroleum refining); natural gas and geothermal resources; pipelines; power transmission facilities; communication facilities; equipment storage yards; and borrow pits.

6.13.3 Impact Analysis

This section explains how potential impacts to Mineral Resources associated with development of the TWRA (including the proposed Alta Wind Project) are assessed. Section 6.13.3.1 presents the significance criteria upon which impact determinations are based. This section also briefly describes the methodology for determining the type and degree of impact that would be produced as a result of TWRA development. All impacts and mitigation measures identified for development of the TWRA are presented in Section 6.13.3.2.

6.13.3.1 Criteria for Determining Impact Significance

The significance criteria listed below are applicable to mineral resources under all types of jurisdiction, including federal, state, local, and private. Development of the TWRA (including the proposed Alta Wind Project) would result in significant impacts to Mineral Resources if it would meet any of the following significance criteria:

- Criterion TWRA MR1: 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.
- Criterion TWRA MR2: 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.

6.13.3.2 Impacts and Mitigation Measures

The following section describes the potential impacts to Mineral Resources that could occur as a result of development of the TWRA (including the proposed Alta Wind Project), as determined by the significance criteria listed above. Mitigation measures are introduced where necessary in order to reduce significant impacts to less-than-significant levels. A summary of identified impacts and associated mitigation measures for the TWRA is presented in Table 6.20-1.

Loss of Availability of Valuable Mineral Resources (Criterion TWRA MR1)

Impact TWRA-MR-1: Construction and operation activities would interfere with access to known mineral resources or county permitted mines.

Figure 6.13-1 identifies Kern County's permitted and historic mines. Each mine within the TWRA is identified by name, and the following mines are within a mile of proposed wind energy projects: Calcite is an idle limestone mine that is operated by California Portland Cement; the Shumaker Mine is an abandoned decomposed granite quarry operated by the CALEX Engineering Company; the Mojave Quarry is an active limestone mine operated by California Portland Cement; and the Gravel Pit is a historic aggregate mine. The Calcite mine borders the proposed PdV Wind Energy Project, and although Calcite is currently idle, construction activities and daily operational activities could potentially interfere with access to the mining site. Both the Shumaker Mine and Mojave Quarry border the proposed Alta Project which could also result in interference with access to these mines. The remaining mining sites would not be directly affected by construction or operation of the proposed wind energy projects presented by this analysis.

Mitigation Measures for Impact TWRA-MR-1

TWRA-MR-1 Coordinate with quarry operations. Operations and management personnel for the affected mines shall be consulted regarding locations of active mining and for coordination of construction activities in and through those areas. A plan to avoid or minimize interference with mining operations shall be prepared in conjunction with mine/quarry operators prior to construction. SCE shall document compliance with this measure prior to the start of construction by submitting the plan to the Kern County for review at least 60 days prior to the start of construction.

CEQA Significance Conclusion

Construction and operation of the proposed wind energy projects could interfere with access to mineral resources and mining operations. However, implementation of Mitigation Measure TWRA-MR-1 (Coordinate with quarry operations) would reduce this impact to a less than significant level (Class II).

Loss of Availability of Locally Important Mineral Resource Recovery Sites (Criterion TWRA MR2)

Impact TWRA-MR-2: Future wind development would traverse resource land designated by the Kern County General Plan.

Figure 6.13-2 identifies the Mineral and Petroleum land use designations noted in the county's general plan. As noted above under local regulatory requirements, Resource Policy 25 discourages incompatible land use adjacent to Mineral and Petroleum areas, and Map Code 8.4 identifies the areas that contain producing or potentially productive petroleum fields and mineral deposits of regional and statewide significance. Uses shall include, but are not limited to, the following: Mineral and petroleum exploration and extraction, including aggregate extraction; extensive and intensive agriculture; mineral and petroleum processing (excluding petroleum refining); natural gas and geothermal resources; pipelines; power transmission facilities; communication facilities; equipment storage yards; and borrow pits.

Existing wind farms and the proposed wind energy projects within the TWRA traverse this land use designation. As noted above, power transmission facilities are a permitted use. Consequently, the proposed wind energy development would be consistent with the General Plan and would not pose an impact. However, access road and construction staging areas are not included in this land use designation, and therefore, would not be consistent with the General Plan.

Mitigation Measures for Impact TWRA-MR-1

TWRA-MR-2 Avoid traversing areas designated as Map Code 8.4 (Mineral and Petroleum). A plan for the proposed access roads and construction staging areas shall be prepared in conjunction with the traffic plan in order to avoid or minimize traversal of the areas identified in Figure 6.13-2. SCE shall document compliance with this measure prior to the start of construction by submitting the plan to Kern County for review at least 60 days prior to the start of construction.

CEQA Significance Conclusion

Construction and operation of the proposed wind energy projects would traverse the Mineral and Petroleum land use designation. Power transmission facilities are a permitted use by the Kern County General Plan; therefore, wind energy development would not be expected to have an impact on the availability of mineral resources. However, access roads and construction staging areas are not a

permitted use. Mitigation Measure TWRA-MR-2 would reduce potential impacts to a less-than-significant level (Class II).

6.14 Noise

This section addresses the potential noise impacts associated with construction and operation of wind energy projects within the TWRA. It describes the baseline noise conditions within the TWRA, the regulatory setting, the potential impacts of TWRA development, and feasible mitigation measures to reduce those impacts. This analysis primarily focuses on the potential impacts of wind energy development of the TWRA in general and broad terms, but also specifically considers several wind projects within the TWRA, including the proposed PdV Wind Energy Project, located in the southwestern corner of the TWRA, and the proposed Alta Wind Project, located in the middle of the TWRA, south of State Route 58 between the cities of Mojave and Tehachapi.

This analysis draws on information from both the August 29, 2006, PdV Wind Energy Project Noise Technical Report and the Tehachapi Renewable Transmission Project Noise Technical Report, dated December 2007. The PdV Technical Report assesses the use of the 3 megawatt (MW) Vestas V90 and the 1 MW Mitsubishi MWT-1000A wind turbines. These wind turbines represent the range of turbines that could be selected for that project, and are good representatives of the types of wind turbines that could be used for wind energy projects throughout the TWRA, including the Alta Wind Project.

Definitions and Thresholds

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air or water. Noise can be defined as unwanted sound. Sound is described by various parameters, including frequency and amplitude. The amplitude is the most common descriptor used to characterize the loudness of an ambient sound level. The decibel (dB) scale is used to quantify sound intensity. Because amplitude can vary enormously within the range of human hearing, a logarithmic loudness scale is used to make sound intensity numbers more convenient and manageable.

In order to better describe potential noise impacts on sensitive receptors, a frequency weighting measure that adjusts for human perception is commonly used. The frequency weighting scale, known as A-weighting, best reflects the human ear's reduced sensitivity to low frequencies. The community noise environment and the consequences of human activities cause noise levels to be widely variable over time. For simplicity, sound levels are usually represented by an equivalent level over a given time period (L_{eq}) or by an aggregated level occurring over a 24-hour day-night period (L_{dn}). The L_{eq}, or equivalent sound level, is a single value for any desired duration, which includes all of the time-varying sound energy in the measurement period, usually one hour. The L_{dn}, or day-night sound level, is equal to the 24-hour equivalent sound level (in dBA) with a 10 dBA penalty applied to nighttime sounds occurring between 10:00 p.m. and 7:00 a.m. The community noise equivalent level (CNEL) is a metric similar to L_{dn} in that it is a 24-hour equivalent level in dBA that includes a 5 dBA penalty to evening sounds (between 7:00 p.m. and 10:00 p.m.) along with the 10 dBA nighttime penalty.

Community noise levels are usually good descriptors of the intensity of nearby human activity. Noise levels are generally considered low when ambient levels are below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA. In wilderness areas, the L_{dn} noise levels can be below 35 dBA. In small towns or rural residential areas, the L_{dn} is more likely to be around 50 or 60 dBA. Levels around 75 dBA are more common in busy urban areas (i.e., downtown areas), and levels up to 85 dBA occur near major freeways and airports.

The surrounding land uses dictate what future noise levels would be considered acceptable or unacceptable. Lower levels are expected in rural or suburban areas than what would be expected for commercial or industrial zones. Nighttime ambient levels in urban environments are about seven decibels lower than the corresponding daytime levels. In rural areas away from roads and other human activity, the day-to-night difference can be considerably less. Noise levels above 45 dBA at night can result in the onset of sleep interference effects. At 70 dBA, sleep interference effects become considerable (U.S. EPA, 1974).

6.14.1 Affected Environment

This section describes the existing noise environment, including typical types of sensitive receptors and approximate ambient noise for the study area. The study area for the noise environment is defined as the area within the TWRA and the surrounding area extending 2,000 feet from the border of the TWRA. The TWRA is located in a largely undeveloped, open region of eastern Kern County, and is mostly devoid of major human-made noise sources, with the exception of aircraft over-flights, mainly from Edwards Air Force Base, and vehicles traveling along State Route 58 and State Route 14, which traverse or are located near the TWRA, respectively.

There are several residential structures throughout the study area, some of which may be used for ranching purposes. However, because this analysis focuses mainly on the programmatic development of the TWRA and only considers specific wind energy project based on limited available information, precise measurements of both noise sources and noise receptors are not available. Therefore, this section does not analyze the exact number and location of residences within the TWRA, but seeks to characterize the type and level of impact that could be expected from wind energy development within the TWRA, including the Alta Wind Project.

Other than the scattered residences mentioned above, the study area is rural and undeveloped in nature and includes agricultural farmlands. There are no hospitals, libraries, schools, places of worship, or other facilities. Two paved roads, State Route 58 and State Route 14, traverses or are located near the TWRA, respectively. In the absence of wind-induced background noise, the sources of the background noise are generally not identifiable, except for the occasional aircraft or passing car.

Existing transmission lines, which create corona noise that sounds like crackling and humming, are a minor source of noise in the TWRA. The noise from corona discharge and similar electrical phenomena associated with high-voltage power transmission is heard near an energized line as a crackling or hissing sound. This noise increases with the voltage of the line, irregularities on the conductor surface caused either by age or moisture, and wet ambient meteorological conditions (such as high humidity, fog, or rain).

Noise measurements conducted near the study area at the west paved terminus of Backus Road and at the junction of Rosamond Boulevard and 170th Street, are considered to be generally representative of the noise levels near the TWRA, including the Alta Wind Project. The Leq noise levels measured over 10-minute periods were 45 dBA at the first location and 40 dBA at the second location.

Construction noise heard by any specific receptor is dominated by the closest and loudest equipment. The types and numbers of construction equipment near any specific receptor location would vary over time. A conservative estimate of construction noise levels at various distances is presented below in Table 6.14-1.

Table 6.14-1. Estimated Construction Equipment Noise Levels vs. Distance	
Distance from Construction Activity (feet)	L_{eq} Noise Level (dBA)
50	83.0
100	79.0
200	74.0
400	69.0
800	63.0
1,600	58.0
3,200	52.0
6,400	46.0

Source: Tehachapi Renewable Transmission Project Noise Technical Report, December 2007

Alta Wind Project

The proposed Alta Wind Project is located within the southern portion of the TWRA. The setting of the proposed Alta Project site is generally similar to the TWRA. The proposed project site is located in an undeveloped, open region of eastern Kern County. The nearest sensitive receptors to the project site are homes and residences (located approximately 390 feet from the northwest portion of the site) and users of the Pacific Crest Trail. There are also residences within approximately 800 to 1,800 feet from where WTGs would be constructed on the southwest portion of the site. Other sensitive receptors are residences located between two to three miles to the northeast, east, and southeast of the eastern portion of the site. No major human-made noise sources exist in the proposed project area, with the exception of occasional aircraft flyovers. There are no private airstrips within the proposed project area or within two miles of the project site.

6.14.2 Applicable Laws, Regulations, and Standards

6.14.2.1 Federal

There are no federal regulations that apply to noise specifically from commercial wind turbine operation. However, there are federal guidelines that set out acceptable threshold noise levels at residential receptors, and these guidelines may help to define a threshold for acceptable noise levels at residences in this case. As a guideline, the U.S. Environmental Protection Agency (EPA) identified an L_{dn} value of 55 dBA as the threshold of activity interference outside farm residences.

With regard to noise exposure of workers, the federal Occupational Safety and Health Administration (OSHA) establishes regulations to safeguard the hearing of workers exposed to occupational noise (29 CFR Section 1910.95, Code of Federal Regulations).

6.14.2.2 State

There are no state regulations that apply to noise specifically from commercial wind turbine operation. However, there are general state guidelines that set out acceptable threshold noise levels at residential receptors, and these guidelines may help to define a threshold for acceptable noise levels at residences in this case.

The California Department of Health Services has identified L_{dn} or CNEL values of 60 dBA or less as normally acceptable outdoor levels for residential use. In areas exceeding an L_{dn} of 60 dBA, if a multi-family residential building is proposed, Title 24 of the California Administrative Code requires the preparation of a noise mitigation study.

The State of California requires each local government to perform noise surveys and implement a noise element as part of its general plan (OPR, 2003).

6.14.2.3 Local

Each local government aims to protect its residents from intrusive noise during both construction and operational activities. Noise levels within the TWRA, including within the Alta Wind Project area, are subject to the policies and ordinances of Kern County. The applicable County documents are the Noise Element of the Kern County General Plan and Section 19.64.140.J of the Kern County Zoning Ordinance, which is found in Chapter 19.64, Wind Energy (WE) Combining District. These applicable policies and ordinances are identified below and analyzed for consistency under the discussion for Criterion TWRA NOI1.

Kern County General Plan Noise Element

The Kern County General Plan Noise Element was updated in June 2004. The Noise Element identifies goals, policies, and implementation measures that are used to guide development with regard to noise. The Kern County General Plan Noise Element identifies residential areas as noise sensitive. In noise sensitive areas, the noise level generated by new projects is to be mitigated to 65 dB L_{dn} or less in outdoor activity areas and 45 dB L_{dn} or less within interior living spaces, as specified in the Kern County Zoning Ordinance Section 19.64.140.J. Following are the goals and policies put forth in the Kern County General Plan Noise Element:

Goals

- **Goal 1.** Ensure that residents of Kern County are protected from excessive noise and that moderate levels of noise are maintained.

Policies

- **Policy 1.** Review discretionary industrial, commercial, or other noise-generating land use projects for compatibility with nearby noise-sensitive land uses.
- **Policy 2.** 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)
- **Policy 3.** Encourage vegetation and landscaping along roadways and adjacent to other noise sources in order to increase absorption of noise.
- **Policy 4.** Utilize good land use planning principles to reduce conflicts related to noise emissions.
- **Policy 5.** Prohibit new noise-sensitive land uses in noise-impacted areas unless effective mitigation measures are incorporated into the project design. Such mitigation shall be designed to reduce noise to the following levels:
    - a. 65 dB-L_{dn} or less in outdoor activity areas.
    - b. 45 dB-L_{dn} or less within living spaces or other noise sensitive interior spaces.
- **Policy 7.** Employ the best available methods of noise control.
- **Policy 8.** Enforce State Noise Insulation Standards (California Administrative Code, Title 24) and Chapter 35 of the Uniform Building Code

Kern County Zoning Ordinance

Under the Kern County Zoning Ordinance, the applicable noise regulations are contained in Chapter 19.64 (Wind Energy Combining District). Specifically, subsection J of Section 19.64.140 (Development Standards and Conditions) for wind energy projects, provides specific requirements for allowable noise from wind turbine generators. These include limits on the overall A-weighted noise level, limits on noise

in specific lower frequency 1/3 octave band levels, more strict requirements for tonal noise emission, and more strict requirements for repetitive impulsive sound. The requirements of subsection J of Section 19.64.140 are presented here:

19.64.140 (DEVELOPMENT STANDARDS AND CONDITIONS) – Subsection J

J. Where a residence, school, church, public library, or other sensitive or highly sensitive land use, as identified in the Noise Element of the County General Plan, is located within one (1) mile in a prevailing downwind direction or within one-half (1/2) mile in any other direction of a project's exterior boundary, an acoustical analysis shall be prepared by a qualified acoustical consultant prior to the issuance of any building permit. The consultant and the resulting report shall be subject to review and approval by the Kern County Health Department. The report shall address any potential impacts on sensitive or highly sensitive land uses. In addition, the acoustical report shall demonstrate that the proposed development shall comply with the following criteria:

1. Audible noise due to wind turbine operations shall not be created which causes the exterior noise level to exceed forty-five (45) dBA for more than five (5) minutes out of any one- (1-) hour time period (L8.3) or to exceed fifty (50) dBA for any period of time when measured within fifty (50) feet of any existing residence, school, hospital, church, or public library.

2. Low frequency noise or infrasound from wind turbine operations shall not be created which causes the exterior noise level to exceed the following limits when measured within fifty (50) feet of any existing residence, school, hospital, church, or public library.

3. In the event audible noise due to wind turbine operations contains a steady pure tone, such as a whine, screech, or hum, the standards for audible noise set forth in Subparagraph (1) of this subsection shall be reduced by five (5) dBA. A pure tone is defined to exist if the one-third (1/3) octave band sound pressure level in the band, including the tone, exceeds the arithmetic average of the sound pressure levels of the two (2) contiguous one-third (1/3) octave bands by five (5) dBA for center frequencies of five hundred (500) Hz and above, by eight (8) dBA for center frequencies between one hundred and sixty (160) Hz and four hundred (400) Hz, or by fifteen (15) dBA for center frequencies less than or equal to one hundred and twenty-five (125) Hz.

4. In the event the audible noise due to wind turbine operations contains repetitive impulsive sounds, the standards for audible noise set forth in Subparagraph (1) of this subsection shall be reduced by five (5) dBA.

5. In the event the audible noise due to wind turbine operations contains both a pure tone and repetitive impulsive sounds, the standards for audible noise set forth in Subparagraph (1) of this subsection shall be reduced by a total of five (5) dBA.

6. In the event the ambient noise level (exclusive of the development in question) exceeds one (1) of the standards given above, the applicable standard shall be adjusted so as to equal the ambient noise level. For audible noise, the ambient noise level shall be expressed in terms of the highest whole number sound pressure level in dBA which is exceeded for no more than five (5) minutes per hour (L8.3).

For low frequency noise or infrasound, the ambient noise level shall be expressed in terms of the equivalent level (Leq) for the one-third (1/3) octave band in question, rounded to the nearest whole decibel. Ambient noise levels shall be measured within fifty (50) feet of potentially affected existing residences, schools, hospitals, churches, or public libraries. Ambient noise level measurement techniques shall employ all practical means of reducing the effects of wind-generated noise at the microphone.

Ambient noise level measurements may be performed when wind velocities at the proposed project site are sufficient to allow wind turbine operation, provided that the wind velocity does not exceed thirty (30) mph at the ambient noise measurement location.

7. Any noise level falling between two (2) whole decibels shall be the lower of the two (2).

8. In the event that noise levels, resulting from a proposed development, exceed the criteria listed above, a waiver to said levels may be granted by the Planning Director provided that the following has been accomplished:

a. Written consent from the affected property owners has been obtained stating that they are aware of the proposed development and the noise limitations imposed by this code, and that consent is granted to allow noise levels to exceed the maximum limits allowed.

b. A permanent noise impact easement has been recorded in the County Hall of Records which describes the benefited and burdened properties and which advises all subsequent owners of the burdened property that noise levels in excess of those permitted by this code may exist on or at the burdened property.

6.14.3 Impact Analysis

This section presents the noise impacts that would result from the development of the TWRA, including development of the Alta Wind Project. Based on available information, this programmatic impact analysis assesses known future wind energy development within the TWRA (including the Alta Wind Project) and describes the reasonably expected impacts that would result from predicted but unknown future development of the TWRA.

6.14.3.1 Criteria for Determining Impact Significance

Impact significance is assessed based on criteria derived from the Kern County Initial Study Checklist. Noise impacts would be considered significant if activities or actions associated with development of the TWRA (including the Alta Wind Project) would result in:

- Criterion TWRA NOI1 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;
- Criterion TWRA NOI2 Exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels;
- Criterion TWRA NOI3 Substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- Criterion TWRA NOI4 Substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- Criterion TWRA NOI5 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
- Criterion TWRA NOI6 For a project within the vicinity of a private airstrip, exposure of people residing or working in the project area to excessive noise levels.

6.13.3.2 Impacts and Mitigation Measures

The following section describes potential direct and indirect impacts and mitigation measures related to Noise that could occur as a result of projects associated with development of the TWRA, including the

Alta Wind Project. A summary of identified impacts and associated mitigation measures for the TWRA is presented in Table 6.20-1.

Expose Persons to Noise in Excess of Standards Established in the Kern County General Plan or Noise Ordinances, or Other Applicable Standards (Criterion TWRA NOI1)

Impact TWRA-N-1: Operational noise levels produced by wind turbines would violate local standards.

It is not possible to determine with certainty the probability that a local standard would be violated by operational noise levels produced by wind turbines within the TWRA. Neither the precise number nor the precise location of the wind turbines and the sensitive receptors within the TWRA is known at the time of this analysis. However, some assumptions can be made based on the analysis that was conducted for the PdV Wind Energy Project.

The PdV noise analysis calculated specific noise levels at specific locations by analyzing the combined noise contribution of several configurations of wind turbines to the noise level at each sensitive receptor site within the PdV Project area. The noise level was determined at each residence based on the highest noise level produced by each of the two wind turbine models (the Mitsubishi 1.0 MW turbine and the Vestas V90 3.0 MW turbine). The total noise level was then calculated by adding up the contribution of the individual turbines until the turbines were too distant to add more to the total. These noise levels were analyzed under both non-varying and varying wind conditions.

For non-varying wind conditions, using the worst-case CNEL values, the wind turbines would be operating at their highest noise level for the complete 24-hour period. At one residence, this produced a CNEL of 65 dBA, equal to the Kern County General Plan outdoor limit for new projects, but in excess of the corresponding WE Combining District outdoor limit of 50 dBA within 50 feet of a residence and possibly the WE Combining District outdoor limit of 45 dBA for more than 5 minutes per hour, as well as the General Plan indoor limit of 45 dBA. For other residences and/or when the Mitsubishi wind turbine was used exclusively for analysis purposes, the CNEL values would be below 65 dBA, but could still exceed the County General Plan indoor limit of 45 dBA as well as the WE Combining District outdoor limit of 50 dBA within 50 feet of each residence and the WE Combining District outdoor limit of 45 dBA for more than 5 minutes per hour.

For varying wind conditions, the noise level at each residence was determined as a function of wind speed using the sound power level curves for the two wind turbines. This was done in 1 meter per second (m/s) increments for each residence and each of four layout scenario/wind turbine model combinations. For both the Mitsubishi unit and the Vestas V90 unit, the predicted levels remain below the General Plan outdoor criterion of 65 dBA for all wind speeds, all residences, and both layout scenarios. However, the Mitsubishi unit may exceed the WE Combining District limit of 50 dBA within 50 feet of a residence in several instances. For the Vestas V90, the levels at almost all residences may exceed the WE Combining District limit of 50 dBA within 50 feet of a residence. Both the Vestas V90 and the Mitsubishi unit may exceed the WE Combining District limit of 45 dBA for more than 5 minutes per hour with regard to all residences. Depending on final siting decisions, the predicted levels may exceed the County General Plan indoor criterion of 45 dBA for the residences exceeding 50 dBA.

In addition to the analysis discussed above, the PdV environmental analysis also considered the potential impact on low frequency noise levels. In the WE Combining District, limits for noise at residences is stated for 1/3 octave bands centered from 2 to 125 Hz. To do this, the A-weighted sound power levels

from 125 Hz and below were un-weighted. These un-weighted levels were used in the same operational noise analysis as described above for the A-weighted levels.

The potential impact of the PdV Project on the low frequency noise level was first analyzed under non-varying wind conditions. As an initial evaluation, the low frequency levels were calculated for the maximum noise generation wind speed for each wind turbine: 9 m/s for the Vestas V90, and 13 m/s for the Mitsubishi MWT-1000A. This was done for each frequency band, residence, and layout scenario/wind turbine model configuration. For the Vestas unit, the 1/3 octave band centered at 63 Hz is most problematic, however four other frequencies also exceed the limits. For the Mitsubishi unit, the two band limits are also exceeded, though by smaller amounts. For the Mitsubishi unit, the most problematic frequency is 125 Hz.

To evaluate the low-frequency wind turbine noise against the wind varying background L_{eq} levels, the same process to generate the noise criteria curve for the overall A-weighted levels was applied for each of the 1/3 octave bands between 25 and 125 Hz. The PdV environmental analysis concluded that the most stringent requirements for project noise are the WE Combining District 45 dBA limit on low frequency limits between 2 and 125 Hz.

Based on the above analysis of the PdV Wind Energy Project, the Vestas V90 unit and the Mitsubishi MWT-1000A unit may exceed the County's WE Combining District outdoor limit of 50 dBA within 50 feet of a residence, and possibly the WE Combining District outdoor limit of 45 dBA for more than 5 minutes per hour as well as the General Plan indoor limit of 45 dBA. No Mitsubishi MWT-1000A low-frequency impacts are expected to be significant. If the Vestas V90 wind turbines are used, low frequency noise impacts would be potentially significant. Low frequency noise impacts could be mitigated by the substitution of the Mitsubishi MWT-1000A for the Vestas V90 units for all wind turbines within 2,500 feet of a residence.

All of the analysis presented above is specific to the PdV Wind Energy Project. However, that project is situated within the TWRA, towards the south-western end of the study area. Similar data (including wind turbine placement and location of sensitive receptors, such as residences) is not available for all of the proposed and anticipated wind energy development within the TWRA, including the Alta Project. Based on the best available information at the time of this analysis, it can reasonably be assumed that the impacts of wind energy development within the TWRA will be similar to the impacts described for the PdV Wind Energy Project.

It is currently unknown whether or not new wind turbines would be placed sufficiently close to sensitive receptors to produce the same level of noise impacts as described above for the PdV Project. However, if any new wind turbines associated with wind energy development projects within the TWRA were placed within similar distances to sensitive receptors as described under the analysis for PdV, then the noise impacts of those wind turbines would be similar to those described for the PdV Project.

Mitigation Measures for Impact TWRA-N-1

TWRA-N-1a **Submit noise report prior to construction.** Prior to building permit approval and prior to final plot plan approval, any applicant for a wind energy project within the TWRA shall submit a final noise report for residences located within one mile in a prevailing wind direction, or within one-half mile in any other direction, of the project's boundary. The report shall demonstrate compliance with County Code Section 19.64.140.J WE Combining District performance standards as well as the County General Plan Noise Element policies regarding outdoor and interior noise levels.

TWRA-N-1b **Reduce low-frequency noise levels for sensitive receptors.** If the Vestas V90 wind turbines or other turbines with a similar low frequency noise profile are selected for use in any TWRA wind energy project, the applicant shall implement one of the following methods to reduce low frequency noise impacts to a less than significant level:

a. Submit a final noise report showing that by limiting the cut-on speed of these units to 9 m/s the noise impacts will be reduced to less than significant levels;

b. Submit a final noise report showing that a final construction plan provides sufficient distance between the turbines and the residences and reduces noise levels to a less than significant level; or

c. Submit a final noise report showing that using a mix of Mitsubishi, Vestas, and/or other turbine models will reduce noise levels to a less than significant level.

TWRA-N-1c **Prepare Operational Noise Complaint Plan.** If the Vestas V90 wind turbines or other turbines with similar noise profiles are selected for use in a wind energy project within the TWRA, the applicant shall submit an Operational Noise Complaint Plan to Kern County for approval prior to issuance of a building permit for the project. The plan shall detail how the applicant will respond to operational noise complaints, keep the County apprised of all complaints, and document the resolution of those complaints.

CEQA Significance Conclusion

Wind energy development within the TWRA would potentially raise noise levels such that the standards adopted by Kern County would be violated. The probability that these standards would be violated depends upon the placement of the wind turbines and the location of the sensitive receptors. Based on assumptions derived from the analysis that was conducted for the PdV Project, this impact would be less than significant with incorporation of the Mitigation Measures N-1a through N-1c (Class II).

Expose Persons to or Generate Excessive Groundborne Vibration or Groundborne Noise Levels (Criterion TWRA NOI2)

Impact TWRA-N-2: Construction activities could temporarily expose residences or other sensitive receptors to excessive groundborne vibration.

Groundborne vibration would be caused by earth movement or the movement of heavy machinery during the construction phase of a wind energy project within the TWRA. Typical activities associated with wind energy development within the TWRA that would produce groundborne vibration include access road construction and improvement, wind turbine site preparation and/or excavation, and the transportation and construction of wind turbines. The TWRA is a rural area with very few scattered residences in the vicinity. The noise analysis that was conducted for the PdV Wind Energy Project concluded that the residence nearest to any source of groundborne vibration is sufficiently far from the construction site that it would not be subject to excessive vibration. It is anticipated that future wind development within the TWRA would maintain similar distance between residences and construction sites for wind turbines.

CEQA Significance Conclusion

Construction activities associated with wind energy development within the TWRA would cause temporary groundborne vibration and groundborne noise. However, it is anticipated that sufficient distance between residences and wind turbine construction sites would be maintained to prevent exposure to excessive groundborne vibration and groundborne noise. Based on a reasonable expectation of sufficient distance between sensitive receptors and future wind turbine construction sites, it is anticipated that this impact would be less than significant (Class III).

Cause a Substantial Permanent Increase in Ambient Noise Levels in the Study Area above Levels Existing without the Development of the TWRA (Criterion TWRA NOI3)

Impact TWRA-N-3: Operational noise levels produced by wind turbines would exceed baseline conditions.

Potential substantial permanent increases in ambient noise levels as a result of wind energy development within the TWRA are discussed above under Criterion TWRA NOI1. It is anticipated that wind energy development within the TWRA would increase ambient noise levels above baseline conditions. This increase is most relevant near sensitive receptors.

Mitigation Measures for Impact TWRA-N-3

TWRA-N-1a **Submit noise report prior to construction.** (See full description under discussion for Impact TWRA-N-1).

TWRA-N-1b **Reduce low-frequency noise levels for sensitive receptors.** (See full description under discussion for Impact TWRA-N-1).

TWRA-N-1c **Prepare Operational Noise Complaint Plan.** (See full description under discussion for Impact TWRA-N-1).

CEQA Significance Conclusion

Wind energy development within the TWRA would raise noise levels above baseline conditions. The significance of that increase in noise depends upon the placement of the wind turbines and the location of the sensitive receptors. Based on assumptions derived from the analysis that was conducted for the PdV Project, this impact would be less than significant with incorporation of the Mitigation Measures N-1a through N-1c (Class II).

Cause a Substantial Temporary or Periodic Increase in Ambient Noise Levels in the TWRA above Existing Levels (Criterion TWRA NOI4)

Impact TWRA-N-4: Construction noise levels would exceed baseline conditions. (Class II)

Site preparation and construction activities would temporarily increase noise levels at residences within the TWRA. The noise would occur mainly from earth movement and operation of heavy-duty construction equipment (e.g., graders, bulldozers, backhoes, and drill rigs). The construction noise would be greatest during scraping, grading, and crane pad development and excavation for the turbine foundation. Road construction would also include using heavy equipment and the noise levels would be similar to excavation and grading. Once the pads are constructed and the foundation excavated, the loudest source of noise would be the cranes lifting the turbines into place.

Several access roads would be constructed and/or re-graded to serve wind energy development projects within the TWRA. Temporary increases in noise would occur due to the operation of construction equipment on these access roads. It is possible that a sensitive receptor, such as a residence, would be located in close proximity to a new or re-graded access road. Use of the access roads by construction personnel may result in a minimal increase in noise impacts on the nearest residence.

There are no noise standards within the Kern County General Plan that apply directly to temporary construction noise. It is anticipated that construction noise associated with wind energy development within the TWRA would adversely impact nearby residences because the area is currently rural and quiet, and the construction noise would not be obscured by existing baseline conditions. However, the

construction noise impacts will be temporary. In addition, noise-generating activities would be limited as described in Mitigation Measures TWRA-N-4a through TWRA-N-4c below.

Mitigation Measures for Impact TWRA-N-4

TWRA-N-4a **Refrain from nighttime construction.** The applicant of a wind energy project within the TWRA shall limit noise-generating construction activities to the following hours: between 6:30 a.m. and as late as 8:00 p.m. Monday through Saturday. If required to meet critical schedule milestones, construction may also occur between 7:00 a.m. and 6:00 p.m. on Sundays.

TWRA-N-4b **Cover engines and maintain mufflers.** The applicant of a wind energy project within the TWRA shall cover equipment engines and ensure that mufflers are in good working condition in order to reduce noise from construction equipment.

TWRA-N-4c **Locate stationary construction equipment away from sensitive receptors.** The applicant of a wind energy project within the TWRA shall locate all stationary equipment such as compressors and welding machines away from noise receptors to the extent practicable.

CEQA Significance Conclusion

Construction activities within the TWRA would cause a temporary increase in ambient noise levels above baseline conditions. The significance of this temporary increase in noise depends upon the placement of the wind turbines and the location of the sensitive receptors. Based on assumptions derived from the analysis that was conducted for the PdV Project, this impact would be less than significant with incorporation of the Mitigation Measures TWRA-N-4a through TWRA-N-4c (Class II).

Expose People Residing or Working in the TWRA to Excessive Noise Levels for a Project Located within the Kern County Airport Land Use Compatibility Plan (Criterion TWRA NOI5)

Impact TWRA-N-5: Exposure of excessive noise levels within an Airport Land Use Compatibility Plan to people residing or working in the TWRA. (Class II)

As described in Impact TWRA-HAZ-6, several airports lie within close proximity to the TWRA. The TWRA falls within the Kern County Airport Land Use Compatibility Plan area for the Mojave Airport and the Mountain Valley Airport. Noise compatibility criteria for commercial and industrial land uses, including utilities, shows a normally acceptable noise level at 75dBA. Portions of the TWRA may be located in or near the existing military flight corridor, which is a low-level, high-speed corridor where sonic booms and related damage are known to have occurred. Noise levels from military over flights often exceed County standards, but those noise sources are not regulated by the County.

Mitigation Measures for Impact TWRA-N-5

TWRA-N-5 **Submit background noise report and coordinate with Kern County prior to construction.** Prior to building permit approval and prior to final plot plan approval, any applicant for a wind energy project within the TWRA shall coordinate with Kern County and submit a final background noise report for the surrounding area including nearby airport/aircraft noise. The report shall demonstrate compliance with the Noise Compatibility Criteria of the Kern County Airport Land Use Compatibility Plan.

CEQA Significance Conclusion

Because the nearest public airport/public use airport is located within 1 mile of the TWRA boundary, and because the TWRA is located inside the Kern County Airport Land Use Compatibility Plan area for the Mojave and Mountain Valley Airports, incorporation of Mitigation Measure TWRA-N-5 would ensure that this impact is less than significant (Class II).

Expose People Residing or Working in the Project Area to Excessive Noise Levels for a Project within the Vicinity of a Private Airstrip (Criterion TWRA NOI6)

Impact TWRA-N-6: Exposure of excessive noise levels within the Vicinity of a Private Airstrip to people residing or working in the TWRA. (Class II)

As described in Impact TWRA-N-5, several airports lie within close proximity to the TWRA. The Pontious Airport and the Skyotee Ranch Airport are both located within 2 miles of the TWRA boundary. Incorporation of Mitigation Measure TWRA-N-5 would ensure that impacts are less than significant.

CEQA Significance Conclusion

Because two private airstrips are located within 2 miles of the study area, implementation of the project could result in the exposure of people working in the project area to excessive noise levels from private aircrafts. Implementation of Mitigation Measure TWRA-N-5 would ensure that this impact is less than significant (Class II).

6.15 Population and Housing

This section addresses the potential Population and Housing impacts of expected and potential wind development in the TWRA. A description of the Affected Environment for Population and Housing is presented below in Section 6.15.1, followed by a description of Applicable Laws, Regulations, and Standards in Section 6.15.2, and the Impact Analysis presented in Section 6.15.3.

6.15.1 Affected Environment

Existing and Projected Population

Kern County is California's third largest county, covering 8,073 square miles. The Kern County Housing Element divides the county into nine subareas: Antelope Valley, Belridge, Frazier Park, Indian Wells Valley, Lake Isabella, Northern San Joaquin Valley, Southern San Joaquin Valley, Tehachapi, and Westside. The TWRA is located within the Tehachapi and Antelope Valley subareas.

The Tehachapi subarea is located in the southern Sierra Nevada Mountains and encompasses 1,264 square miles. It includes the city of Tehachapi and the unincorporated communities of Golden Hills, Stallion Springs, Bear Valley Springs, and Old Town. This subarea had a population of 28,415 in the year 2000, with 17,458 residents in the unincorporated areas (Kern County, 2002). Main employment sectors include resource extraction, wind power generation, building material production, and agricultural activity. A significant number of residents are also employed at the Tehachapi correctional institution.

The Antelope Valley subarea is located in the southeastern quarter of Kern County and encompasses 1,381 square miles. It includes California City and the unincorporated communities of Boron, Mojave, North Edwards, Willow Springs, and Rosamond. This subarea had a population of approximately 38,000 in the year 2000, with nearly 30,000 residents in the unincorporated areas (Kern County, 2002). The

main employer in this subarea is the Edwards Air Force Base, a major testing, research, and development facility. Employment is also found in the mineral extraction sector, as borax and gold deposits exist in this subarea.

Table 6.15-1 presents population trends in Kern County derived from 1990 and 2000 U.S. Census Bureau data. Total population calculated includes persons from both household and group quarters.

Table 6.15-1. Population Trends Based on U.S. Census Bureau Data

Area	1990 Population [a]	2000 Total Population	% Change 1990 to 2000
Incorporated	282,379	397,542	40.8%
Unincorporated	262,602	264,111	0.6%
Total	544,981	661,653	21.4%

Sources: U.S. Census Bureau 2007.

Notes: [a] 1990 U.S. Census data were updated, and revised numbers were issued in California Department of Finance Report E-4 (California Department of Finance 2007a).

Population growth changed significantly in the incorporated cities of Kern County from 1990 to 2000. A slight growth of less than 1 percent occurred in the unincorporated cities of Kern County. Table 6.15-2 presents population trends in Kern County, derived from population estimates and projections from the California Department of Finance. The 2000 U.S. Census Bureau is used as a benchmark. This table clearly shows that population growth continues to take place at a much higher rate in the incorporated cities of Kern County as opposed to the unincorporated cities.

Table 6.15-2. Population Trends Based on California Department of Finance Population Estimates and Projections

Area	2000 Total Population	2006 Population Estimate	2007 Population Estimate	Percent Change 2000 to 2007	Percent Change 2006 to 2007
Incorporated	397,542	490,374	508,638	27.9%	3.7%
Unincorporated	264,111	289,116	293,010	10.9%	1.3%
Total	661,653	779,490	779,869	17.9%	0.05%

Source: California Department of Finance 2007a.

Population in Kern County has been historically volatile and is expected to continue in this fashion into the future (Power Partners Southwest, LLC, 2007). Historic energy cycles to increased construction and associated in-migration can explain the variability in the population. Population increase during the past years was largely driven by the significant amount of construction that is currently under way and to housing that is still affordable, relative to the coastal areas of California. As a result, Kern County is experiencing significant migratory growth, while the natural increase in population is fairly constant (Power Partners Southwest, LLC, 2007). The California Department of Finance projects population growth in Kern County to be approximately 4 percent by 2010 and, beginning in 2010, will see annual growth between approximately 17 percent and 19 percent (Power Partners Southwest, LLC, Section 4.12, 2007).

Existing and Projected Housing

Similar to population growth, housing in Kern County grew primarily in the incorporated cities. According to United States Census Bureau data, housing units in Kern County grew by 16.4 percent from 1990 to 2000 (California Department of Finance, 2007b). Tables 6.15-3 and 6.15-4 show housing data based on Census Bureau and California Department of Finance estimates and projections, respectively.

Table 6.15-3. Housing Trends Based on U.S. Census Bureau Data			
Area	1990 Total Housing Units[a]	2000 Total Housing Units	% Change 1990 to 2000
Incorporated *Percent Vacant*	99,835 ---	130,873 *6.64*	31.1%
Unincorporated *Percent Vacant*	99,101 ---	100,694 *14.12*	1.6%
Total *Percent Vacant*	198,936 ---	231,567 *9.89*	16.4%

Source: California Department of Finance 2007b.
Note: Population estimates are projections and subject to change.

Housing and vacancy rates have increased significantly in the incorporated and unincorporated areas, respectively of Kern County from 2000 to 2007.

Table 6.15-4. Housing Trends Based on California Department of Finance Population Estimates and Projections					
Area	2000 Total Housing Units	2006 Total Housing Units	2007 Total Housing Units	Percent Change 2000 to 2007	Percent Change 2006 to 2007
Incorporated *Percent Vacant*	130,873 6.64	155,079 6.16	160,685 6.31	22.8%	3.6%
Unincorporated *Percent Vacant*	100,694 14.12	107,855 14.73	109,931 15.35	9.2%	1.9%
Total *Percent Vacant*	231,567 9.89	262,934 9.68	270,616 9.99	16.9%	2.9%

Source: California Department of Finance 2007b.

Employment

Nearly 305,000 persons make up the year-round labor force in Kern County, which has been growing with an average annual rate of 1.43 percent since 1994 (Power Partners Southwest, LLC, 2007). Kern County's total employment grew faster than the growth of its labor force between 1993 and 2004, suggesting that the economy was adding jobs faster than new labor (Power Partners Southwest, LLC, 2007). Table 6.15-5 shows Kern County's employment profile.

Table 6.15-5. Employment Profile	
Class	Percent
Private Wage and Salary	71.2 %
Government	20.6 %
Self-employed	7.8 %
Unpaid family workers	0.5 %

Source: U.S. Census Bureau 2000.

Data from the Central California Economic Development Corporation states Kern County's unemployment rate has ranged from a high of 13 percent in 1996 to a low of 7.3 percent in May 2006, compared with California's seasonally adjusted unemployment rate of 7.3 percent in 1996 and 5.1 percent in January 2006 (Power Partners Southwest, LLC, 2007). In 1998, Kern's labor force was 278,800 with 12.2 percent unemployment and 338,400 in 2006 with 7.6 percent unemployment; compare this to California's 6 percent unemployment rate in 1998 with a labor force of 15.2 million and 4.9 percent in 2006 with 17.9 million employed (Power Partners Southwest, LLC, 2007). As of 2004, 17.8 percent of individuals in Kern County live below poverty level, compared to 13.2 percent for California (U.S. Census, 2007).

Table 6.15-6 summarizes employment industries in Kern County and the percent of individuals in each industry. Educational, health, and social services; agriculture, forestry, fishing, hunting, and mining; and retail trade industries provided over 42 percent of employment opportunities in 2000. The agriculture industry appears to have reached a plateau in recent years and the annual total crop value, adjusted for inflation, has remained relatively constant since 1993 (Power Partners Southwest, LLC, 2007). Agriculturally oriented counties tend to have greater seasonal variations in employment and higher unemployment rates (Power Partners Southwest, LLC, 2007).

Table 6.15-6. Employment Industries in Kern County

Industry	Percent of Population
Agriculture, Forestry, Fishing, Hunting, and Mining	12.3
Construction	6.9
Manufacturing	6.0
Wholesale Trade	4.8
Retail Trade	10.7
Transportation, Warehousing, and Utilities	5.3
Information	1.8
Finance, Insurance, Real Estate, and Rental and Leasing	4.8
Professional, Scientific, Management, Administrative, and Waste Management Services	7.6
Educational, Health, and Social Services	19.6
Arts, Entertainment, Recreation, Accommodation, and Food Services	7.1
Other Services (except public administration)	5.0
Public Administration	8.2

Source: U.S. Census Bureau 2000.

A large portion of Kern County residents are employed in the government sector as well. Government jobs include, but are not limited to teachers; local, state, and federal government employees; and correctional facility employees. There has been growth in prison jobs, although given the revenue picture for California, growth is unlikely to continue in the immediate future; and the number of federal jobs has declined in the past decade due to the loss of military-related jobs (Power Partners Southwest, LLC, 2007).

Alta Wind Project

The proposed Alta Wind Project is located within the southern portion of the TWRA and the Tehachapi subarea of Kern County. The population and housing setting described above for the TWRA analysis applies directly to the Alta Wind Project.

6.15.2 Applicable Regulations, Plans, and Standards

6.15.2.1 Federal

Activities associated with development of the TWRA (including the proposed Alta Wind Project) would be subject to the same Federal requirements as specified in Section 3.12 (Socioeconomics). The TWRA does not include National Forest System lands, and is therefore not subject to the USDA Forest Service Land Management Plan (FLMP).

6.15.2.2 State

Activities associated with development of the TWRA (including the proposed Alta Wind Project) would be subject to the same State requirements as specified in Section 3.12 (Socioeconomics).

6.15.2.3 Local

Activities associated with development of the TWRA (including the proposed Alta Wind Project) would be subject to the same local requirements as specified in Section 3.12 (Socioeconomics).. However, as opposed to the proposed TRTP, which crosses through several different counties, the TWRA (including the proposed Alta Wind Project) is situated entirely within Kern County and is therefore only subject to Kern County regulations and requirements.

6.15.3 Impact Analysis

This section explains how potential impacts to Population and Housing associated with development of the TWRA (including the proposed Alta Wind Project) are assessed. Section 6.15.3.1 presents the significance criteria upon which impact determinations are based. This section also briefly describes the methodology for determining the type and degree of impact that would be produced as a result of TWRA development. All impacts and mitigation measures identified for development of the TWRA are presented in Section 6.15.3.2.

6.15.3.1 Criteria for Determining Impact Significance

Impact significance is assessed based on criteria derived from the Kern County Initial Study Checklist. Population and Housing impacts would be considered significant if activities or actions associated with development of the TWRA (including the proposed Alta Wind Project) would:

- Criterion TWRA POP1: Induce substantial population growth in an area either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure).
- Criterion TWRA POP2: Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere.
- Criterion TWRA POP3: Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

6.15.3.2 Impacts and Mitigation Measures

The following section describes potential impacts and mitigation measures related to Population and Housing that could occur as a result of development of the TWRA (including the proposed Alta Wind Project). A summary of identified impacts and associated mitigation measures for the TWRA is presented in Table 6.20-1.

Substantial Population Growth (Criterion TWRA POP1)

Impact TWRA-POP-1: Future wind development would induce substantial population growth.

The development of the TWRA would not create a significant number of jobs and induce substantial population growth during construction or operation of future wind projects. Since a portion of the construction work force for each future wind project is likely to come from the proposed wind project area, it would negate an increase in population from individuals relocating to Kern County.

The TWRA is an undeveloped area which requires future construction workers to commute to their respective wind project sites. This would require the construction workers to find housing in nearby cities, including Rosamond, Tehachapi, and Mojave. Given the existing accommodations and vacancy rates in these cities, they are expected to be able to accommodate the small increase in future wind project-related construction work force. Additionally, future wind projects within the TWRA are not expected to

all be constructed at the same time as the availability of wind turbines may require construction of wind projects to occur years apart from each other. Therefore, the wind construction work force would fluctuate over time. Operation of the future wind development projects is not expected to generate a workforce that would induce substantial population growth. Future operation personnel are expected to be approximately 10 to 30 employees for each project. Operation of the proposed Alta Wind Project is expected to require up to approximately 30 full-time and part-time staff.

CEQA Significance Conclusion

Direct impacts from future wind projects on population and the local housing market are not expected and this impact would be less than significant. Future wind development would comply with the goals, policies, and implementation measures of the Kern County General Plan. No mitigation measures are proposed (Class III).

Displace Existing Housing (Criterion TWRA POP2)

Very few scattered residences are located within the TWRA and are not expected to be displaced by future proposed wind projects. Thus, no residences are expected to be displaced by development of the TWRA. There would be no impact. The development of the TWRA would comply with the goals, policies, and implementation measures of the Kern County General Plan. No mitigation measures are proposed.

Displace Existing Residents (Criterion TWRA POP3)

The development of the TWRA is not expected to displace residents or remove existing housing. There would be no impact. The development of the TWRA would comply with the goals, policies, and implementation measures of the Kern County General Plan. No mitigation measures are proposed.

6.16 Public Services

This section addresses the potential Public Services impacts of expected and potential wind development in the TWRA. A description of the Affected Environment for Public Services is presented below in Section 6.16.1, followed by a description of Applicable Laws, Regulations, and Standards in Section 6.16.2, and the Impact Analysis presented in Section 6.16.3.

6.16.1 Affected Environment

Fire

Fire suppression and emergency medical services are provided to Kern County by the Kern County Fire Department (KCFD). The KCFD operates 45 full-time fire stations and one seasonal station and is divided into six battalions for operational management (Power Partners Southwest, LLC, 2007). The TWRA is located within Battalion 1 of the KCFD, which consists of seven fire stations. Battalion 1 is bounded by the Central Valley to the west, the Tehachapi Mountains in the center, and the Mojave Desert on the east. The TWRA is also located within close proximity to Battalions 2 and 7. The following nine fire stations are located within close proximity to the TWRA and would provide service to future wind projects within the TWRA:

- **Station 11: Keene Station.** This station is located at 30356 Woodford Tehachapi Road in Keene, west of the TWRA and serves a 138 square mile area.

- **Station 12: Tehachapi Station.** This station is located at 800 South Curry Street in Tehachapi, west of the TWRA and serves a 220 square mile area and a population of 12,639 individuals.
- **Station 14: Mojave Station.** This station is located at 1953 Highway 58 in Mojave, east of the TWRA and serves a 431 square mile area and a population of 5,068 individuals.
- **Station 15: Rosamond Station.** This station is located at 3219 35th Street in Rosamond, south of the TWRA and serves a 248 square mile area and a population of 9,907 individuals.
- **Station 16: Bear Valley Station.** This station is located at 28946 Bear Valley Road in Tehachapi, west of the TWRA and serves a 55 square mile area.
- **Station 17: Boron Station.** This station is located at 26965 Cote Street in Boron, east of the TWRA and serves a 144 square mile area.
- **Station 18: Stallion Springs Station.** This station is located at 28381 Braeburn Place, #22 in Stallion Springs, west of the TWRA and serves a 46 square mile area.
- **Station 56: Lebec Station.** This station is located at 1548 Golden State Highway in Lebec, southwest of the TWRA and serves a 350 square mile area.
- **Station 78: Piute Station.** This station is located at 16001 Walker Basin Road in Caliente, northwest of the TWRA and serves a 289 square mile area.

In the event of a major fire, resources from any of these stations, as well as others within Kern County, would be called on to respond as necessary.

Law Enforcement

The California Highway Patrol (CHP) enforces traffic regulation, oversees response to emergency incidents on California's highway, and assists other public agencies responding to emergency incidents. The CHP also promotes the safe and efficient movement of people and goods on California highways to minimize loss of life, injuries, and property damage. Kern County is located in the Central Division service area of the CHP. The Central Division is comprised of 15 area offices, six resident posts, two commercial inspection facilities, 696 uniformed officers, and 230 non-uniformed personnel. The CHP Mojave Office, located in Mojave, would provide emergency response and traffic regulation to future wind projects within the TWRA. This office patrols the Highway 14 corridor along the east border of the TWRA, to the southern boundary of Kern County.

The Kern County Sheriff's Department would provide police protection services to future wind projects within the TWRA, including patrolling off-highway vehicle recreation areas in the desert and mountainous areas of the County. It currently has a ratio of one sworn officer per 1,000 residents (Power Partners Southwest, LLC, 2007). The following three substations of the Kern County Sheriff's Department are located closest to and would be the primary providers of police protection services to future wind projects within the TWRA (Wood, 2008):

- Mojave Substation. This station is located at 1771 Highway 58 in Mojave, east of the TWRA. It covers approximately 1,320 square miles of mostly desert terrain and services approximately 14,000 people.
- Tehachapi Substation. This station is located at 22209 Old Town Road in Tehachapi, west of the TWRA. It covers approximately 572 square miles of small service districts and property owner associations. Approximately 35,000 people reside in the Tehachapi valley, of which 18,000-20,000 people are served by this substation.
- Rosamond Substation**.** This station is located at 1379 Sierra Highway in Rosamond, southeast of the TWRA. It serves approximately 500 square miles.

Response time to an incident would vary, based on whether it is an emergency or non-emergency, weather, the number of deputies on duty, and where deputies are when a call is received, and could be estimated at 20 minutes or more (Power Partners Southwest, LLC, 2007). The CHP and Tehachapi Police Department would be able to assist the Kern County Sheriff's Department during critical incidents that would exceed their response capabilities. Law enforcement agencies in Kern County often assist each other when needed (Wood, 2008).

Medical

The Kern County Emergency Medical Services Department (EMS) would be responsible for coordinating the public, emergency service providers, and hospitals throughout the county. The EMS is responsible for coordinating all system participants in Kern County, including the public, emergency service providers, and hospitals. The county has been divided into 10 geographic regions, in which each region or Exclusive Operating Area (EOA) has been assigned one ambulance provider. The TWRA is located within two regions or EOAs: EOA 8 (serving Arvin, Lamont, Tehachapi, and Frazier Park) and EOA 11 (serving Boron, California City, Mojave, and Rosamond).

Two factors are used to determine the required response time: 1) the Time Zone (location of the incident), and 2) Priority Code (severity of the patient's condition). The five time zones include Metro, Urban, Suburban, Rural, and Wilderness. These time zones are generally based on population density, call volume, proximity to fixed ambulance stations, and historical precedence. The Metro time zone requires the fastest response time and response time requirements become less stringent the further away calls are from a Metro area.

Nine Priority Codes are used in Kern County's EMS system. The first three Priority Codes are used for pre-hospital emergency calls (e.g., typically, calls received through the 911 system for accidents and illnesses that occur along roadways, at workplaces, or at home). Priority Codes 4 through 7 are used for the transfer of a patient from one medical facility to another. The difference between these types of calls and the pre-hospital emergency calls is that a physician or nurse is attending the patient; the calls are usually not as urgent because the patient is already at a medical facility. Priority Codes 8 and 9 are used for special event stand-by and ambulance requests for service outside of Kern County. Response time under Priority 1 can be as quick as nine minutes in the Metro time zone and as slow as seventy-six minutes in the Wilderness time zone.

Two hospitals are located within close proximity to the TWRA and would serve future wind projects within the TWRA: 1) Tehachapi Valley Health Care District, located at 115 West E Street in the city of Tehachapi, west of the TWRA, and 2) Tehachapi Hospital, located at 2041 Belshaw Street in the town of Mojave, east of the TWRA.

Schools

Kern County contains 47 kindergarten through 12th grade school districts (Kern County Superintendent of Schools 2007). The TWRA is located in the Mojave, Tehachapi, and Southern Kern Unified School Districts. Table 6.16-1 provides a list of schools, by school district, that could be utilized by wind project construction and operation work forces.

Table 6.16-1. Schools that can be Utilized by the TWRA		
Mojave Unified School District	Southern Kern Unified School District	Tehachapi Unified School District
Mojave Elementary School	Hamilton Elementary School	Cummings Valley Elementary School
Red Rock Elementary School	Rosamond Elementary School	Golden Hills Elementary School
Ulrich (Robert P.) Elementary School	Tropico Middle School	Tompkins Elementary School
California City Middle School	Rosamond High School	Tehachapi High School
Joshua Middle School	Southern Kern Unified Adult School	Jacobsen Junior High School
Mojave Senior High School	Lincoln (Abraham) Alternative School	Monroe High School (Cont.)
Douglas Adult School	Rare Earth High School (Cont.)	Tehachapi Adult School
Douglas High School (Alternative)		
Red Rock Community Day School		
Mountain View High School (Cont.)		

Only one college, the Cerro Coso Community College, which is located approximately 15.5 miles east of the TWRA is located within close proximity.

Parks

The Kern County Parks and Recreation Department manages 40 neighborhood parks, provides landscape maintenance for 76 county buildings, administers the use of 25 public buildings, and supervises three County golf courses. The following parks are within close proximity to the TWRA and would serve future wind projects within the TWRA:

- **Tehachapi Mountain Park.** The only regional park in close proximity to the TWRA. The park is located adjacent to the central-western boundary of the TWRA. This park is comprised of 5,000 acres and offers a variety of activities, including hiking, camping, and equestrian trail riding (Kern County Parks and Recreation Department, 2007).
- **Mojave West Park.** This park is located on Douglas Avenue, west of Highway 14 in the town of Mojave. It is comprised of 5.25 acres and is not used often by the public due to limited development in the surrounding area.
- **Mojave East Park.** This park is located at Highway 58 and M Street in the town of Mojave. It is comprised of 7.6 acres and is heavily used by community residents and visitors alike. It includes a recreation building, baseball field, basketball court and play equipment.

Additionally, several city and recreation district parks exist throughout Kern County for use. Red Rock Canyon State Park is also located northeast of the TWRA on Highway 14. This park offers a variety of activities, including hiking, auto touring, and horseback riding.

Alta Wind Project

The proposed Alta Wind Project is located within the southern portion of the TWRA. The setting described above for the TWRA analysis applies to the Alta Wind Project as well. The following three fire stations are located within approximately 8 miles of the Alta Wind Project site: Station 12: Tehachapi Station, Station 14: Mojave Station, and Station 15: Rosamond Station, with Station 14 most likely acting as the primary responder to the Alta Wind Project site.

The Alta Wind Project site is located in the Mojave and Tehachapi Unified School Districts. Similar to the TWRA, the CHP Mojave Office and Kern County's Mojave, Rosamond and Tehachapi Sheriff Substations would provide emergency response, traffic regulation and police protection to the proposed Alta Wind Project site. The closest major hospital to the Alta Wind Project site is the Tehachapi Valley Health Care District and the EMS would be responsible for coordinating all system

participants in Kern County. Parks within close proximity to the Alta Wind Project would include Tehachapi Mountain Park, and Mojave East and West Parks.

6.16.2 Applicable Regulations, Plans, and Standards

6.16.2.1 Federal

Activities associated with development of the TWRA (including the proposed Alta Wind Project) would be subject to the same Federal requirements as specified in Section 3.11 (Public Services and Utilities). The TWRA (including the proposed Alta Wind Project) does not include National Forest System lands, and is therefore not subject to the USDA Forest Service Land Management Plan (FLMP).

6.16.2.2 State

Activities associated with development of the TWRA (including the proposed Alta Wind Project) would be subject to the same State requirements as specified in Section 3.11 (Public Services and Utilities).

6.16.2.3 Local

Activities associated with development of the TWRA (including the proposed Alta Wind Project) would be subject to the same local requirements as specified in Section 3.11 (Public Services and Utilities). However, as opposed to the proposed TRTP, which crosses through several different counties, the TWRA (including the proposed Alta Wind Project) is situated entirely within Kern County and is therefore only subject to Kern County regulations and requirements.

6.16.3 Impact Analysis

This section explains how potential impacts to Public Services associated with development of the TWRA (including the proposed Alta Wind Project) are assessed. Section 6.16.3.1 presents the significance criteria upon which impact determinations are based. This section also briefly describes the methodology for determining the type and degree of impact that would be produced as a result of TWRA development. All impacts and mitigation measures identified for development of the TWRA are presented in Section 6.16.3.2.

6.16.3.1 Criteria for Determining Impact Significance

Impact significance is assessed based on criteria derived from the Kern County Initial Study Checklist. Public Services impacts would be considered significant if activities or actions associated with development of the TWRA (including the proposed Alta Wind Project) would:

- Criterion TWRA PS1: Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or to other performance objectives for fire protection, police protection, schools, parks, or other public facilities.

6.16.3.2 Impacts and Mitigation Measures

The following section describes potential impacts and mitigation measures related to Public Services that could occur as a result of future wind project development within the TWRA (including the proposed Alta Wind Project). A summary of identified impacts and associated mitigation measures for the TWRA is presented in Table 6.20-1.

Increased Demand for Public Services (Criterion TWRA PS1)

Impact TWRA-PS-1: Future wind development would adversely affect fire protection services.

Kern County has a fire rating of moderate to very high. The TWRA is located in an area with moderate to very high fire threat ratings (Kern County Fire Department Office of Emergency Services, 2005). During the construction phase of future proposed wind projects, fire danger could occur at each project site. A Fire Safety Plan would be prepared for each project to reduce the potential for that project to start a wildfire. Nevertheless, development of the TWRA could increase demand on the KCFD when a fire occurs.

Personnel and equipment available at the nine stations of the KCFD noted above would be sufficient to respond to a fire at future wind project sites within the TWRA, should one occur (Marshall, 2008). Additionally, future wind projects within the TWRA are not expected to all be constructed at the same time as the availability of wind turbines may require construction of wind projects to occur years apart from each other. Therefore, construction is expected to occur gradually over time and multiple fires, should they occur, would not all take place at the same time or within the same time period.

CEQA Significance Conclusion

Future wind development would not be expected to exceed existing fire services capacity and would not require additional, permanent fire protection services, equipment, facilities, or personnel. This impact is considered to be less than significant. Development of the TWRA would comply with the goals, policies, and implementation measures of the Kern County General Plan. No mitigation measures would be required (Class III).

Impact TWRA-PS-2: Future wind development would adversely affect police protection services.

Although potential is low, the development of future wind projects within the TWRA may attract vandals or other security risks and potentially increase traffic along Highway 14 that would increase demand on police protection/law enforcement services in the event of an incident. More than likely, fencing the perimeter of each future wind project site would occur to be consistent with the Wind Energy (WE) Combining District requirements. This measure would minimize the need for police surveillance and response.

Development of the TWRA is not expected to induce population growth in the area that would affect the ratio of one sworn officer per 1,000 residents (Power Partners Southwest, LLC, 2007). It is not expected to result in the need to construct new, or to physically alter existing, police protection facilities to maintain an acceptable service level (Wood, 2008). During construction of future wind projects, the volume of traffic associated with the commute of temporary construction workers for each project is not expected to exceed the California Highway Patrol's ability to patrol the highways.

CEQA Significance Conclusion

Future wind development would not be expected to adversely affect police protection services and would comply with the goals, policies, and implementation measures of the Kern County General Plan. This impact is considered to be less than significant and no mitigation measures would be required (Class III).

Impact TWRA-PS-3: Future wind development would adversely affect school capacity.

During construction of future wind projects within the TWRA, the potential exists for the children of temporary construction workers for each project from outside of the project area, to be placed in local schools. It is expected that a portion of the construction workers for each project would be local to the project area and the addition of children for relocating workers would be minimal. Each future wind project is expected to require approximately 10 to 30 permanent employees for operation and it is anticipated that these employees would be local to the project area. In the event that permanent employees relocate from another area, the Mojave, Tehachapi, and Southern Kern Unified School Districts would be able to accommodate the expected increase in the number of students (Power Partners Southwest, LLC, 2007; Tehachapi Unified School District, 2008; Mojave Unified School District, 2008).

CEQA Significance Conclusion

Future wind development would not adversely affect school capacity and would comply with the goals, policies, and implementation measures of the Kern County General Plan. This impact is considered to be less than significant and no mitigation measures would be required (Class III).

Impact TWRA-PS-4: Future wind development would adversely affect parks.

The nearby Tehachapi Mountain Park (5,000 acres) is expected to accommodate increased use by future wind project personnel and their families. The increased use during the development of the TWRA is not expected to exceed the capacity of the park. The population increase is not expected to exceed Kern County's standard of 2.5 acres of parkland per 1,000 residents, given that the current ratio is approximately 7 acres per 1,000 residents (Power Partners Southwest, LLC, 2007). Likewise, increased use at Mojave West and East Parks during development of the TWRA is not expected to exceed the capacities of the parks. Additionally, future wind projects within the TWRA are not expected to all be constructed at the same time as the availability of wind turbines may require construction of wind projects to occur years apart from each other. Therefore, small increases in population and increased use of parks from future projects would not all occur at the same time or within the same time period, but Intermittently over time. The operation workforce (10 to 30 employees per project) is not expected to generate a population that would impact park capacities. For additional discussion on the potential increased use of parks, please see Section 6.18, Wilderness and Recreation.

CEQA Significance Conclusion

Future wind development would not adversely affect parks and would comply with the goals, policies, and implementation measures of the Kern County General Plan. This impact is considered to be less than significant and no mitigation measures would be required (Class III).

Impact TWRA-PS-5: Future wind development would adversely affect medical services.

During construction of future wind projects within the TWRA, the influx of 100 to 200 people for each project may temporarily increase the need for EMS should a medical emergency occur. Restricting access during the construction of each project to properly trained personnel would decrease the likelihood of accidents and the need for emergency medical care. A small number of accidents may occur during the entire construction period of each project, but the small number in addition to other non-project related accidents is not expected to exceed the capacity of existing medical services. The applicant for each project would prepare and implement a Health and Safety Plan to minimize emergency incidents at the project site. Additionally, future wind projects within the TWRA are

not expected to all be constructed at the same time as the availability of wind turbines may require construction of wind projects to occur years apart from each other. Therefore, accidents, should they occur at each project site would not necessarily all occur at the same time or within the same time period. The operation workforce (10 to 30 employees per project) is not expected to generate a population that would impact medical services capabilities.

CEQA Significance Conclusion

Future wind development would not adversely affect medical services and would comply with the goals, policies, and implementation measures of the Kern County General Plan. This impact is considered to be less than significant and no mitigation measures would be required (Class III).

6.17 Public Utilities

This section addresses the Public Utilities impacts of expected and potential wind development in the TWRA. A description of the Affected Environment for Public Utilities is presented below in Section 6.17.1, followed by a description of Applicable Laws, Regulations, and Standards in Section 6.17.2, and the Impact Analysis presented in Section 6.17.3.

6.17.1 Affected Environment

This section addresses potential impacts on public utilities such as water, electricity, natural gas, solid waste and wastewater, and stormwater from future wind projects yet to be developed for the TWRA (including the proposed Alta Wind Project). This section also provides the environmental and regulatory settings and discusses mitigation measures to reduce impacts where applicable.

The TWRA and the proposed Alta Wind Project area are primarily undeveloped rural open space with limited existing utility services available for potential projects. As such, there is no existing water supply system, wastewater treatment or sewer system, stormwater drainage facilities, or gas and electric lines that would serve potential projects. There are existing frequency-based communication facilities located within the TWRA.

Water

Because of the rural nature of the TWRA (including the proposed Alta Wind Project), water systems would not be expected to be established in the vicinity of potential wind project sites. Water would be required during construction for employees and to control dust. If adequate water is available from a well, then well water would be used. However, if well water is not sufficient, water would need to be purchased from another private source and trucked to the site during construction. In the event wells are used, the applicants would be required to obtain a well permit from Kern County prior to construction of a well and would need to provide additional information on volumes of water, rates of withdrawal, and other required data at that time.

Electricity

There is currently no electrical service to the potential wind project sites. However, projects would not require the connection to a electric distribution system because electricity generated by the project itself would be sufficient to provide power as needed during construction or to operate the project. Therefore, potential projects would not place any demand on existing electric systems.

Natural Gas

Pacific Gas and Electric Company is the natural gas provider in Kern County. However, it is not expected that projects would require natural gas during construction or operation of projects. Project would use propane to provide heating or other support as may be necessary. Therefore, the projects would not place any demand on existing natural gas systems.

Solid Waste and Wastewater

The TWRA (including the proposed Alta Wind Project) is in an undeveloped, rural area with no established sewage system. During construction of projects, portable waste facilities would be provided for use by project personnel, and all waste would be disposed of by an approved contractor at an approved disposal site. Wastewater systems for projects would have to comply with the requirements of the County of Kern Department of Environmental Health Services.

Stormwater Drainage

Proposed aboveground project infrastructure would permanently impact from 450 up to 1350 acres of the TWRA by converting these lands to impervious surfaces where the turbine's concrete foundations and other structures are installed, resulting in greater potential for stormwater runoff. Other areas of permanent disturbance would be covered with gravel, vegetation, or other stabilizing treatment, which would still allow for water absorption but would lessen stormwater runoff. As discussed in more detail in Sections 6.9, Geology and Soils, and 6.11, Hydrology and Water Quality, stormwater runoff has the potential to cause impacts on water quality, cause erosion, and result in loss of soils. Because the potential projects would disturb more than 1 acre of land, the projects would be subject to the U.S. Environmental Protection Agency's National Pollutant Discharge Elimination System (NPDES), implemented by the Lahontan Regional Water Quality Control Board and the Kern County Engineering and Survey Services Department. The projects would need to comply with NPDES requirements and develop and implement a Stormwater Pollution Prevention Plan (SWPPP), as required by the Kern County Wind Energy (WE) Zone (Section 19.64.140(k)), which would be submitted to the Kern County Engineering and Survey Services Department.

Alta Wind Project

The proposed Alta Wind Project is located within the southern portion of the TWRA. The setting described above for the TWRA analysis applies to the Alta Wind Project as well. There is no existing water supply system, wastewater treatment or sewer system, stormwater drainage facilities, or gas and electric lines that would serve the proposed Alta Wind Project.

6.17.2 Applicable Laws, Regulations, and Standards

6.17.2.1 Federal

Activities associated with development of the TWRA (including the proposed Alta Wind Project) would be subject to the same Federal requirements as specified in Section 3.11 (Public Services and Utilities).

6.17.2.2 State

State California Energy Commission

The California Energy Commission (CEC) regulates the provision of natural gas and electricity within the state. The CEC is the state's primary energy policy and planning agency. Created in 1974, the CEC has

five major responsibilities: forecasting future energy needs and keeping historical energy data, licensing thermal power plants 50 megawatts or larger, promoting energy efficiency through appliance and building standards, developing energy technologies and supporting renewable energy, and planning for and directing the state response to energy emergencies.

California Integrated Waste Management Board

The California Integrated Waste Management Board is the state agency designated to oversee, manage, and track California's 76 million tons of waste generated each year. It is one of the six agencies under the umbrella of the California Environmental Protection Agency. The California Integrated Waste Management Board develops laws and regulations to control and manage waste, for which enforcement authority is typically delegated to the local government. The board works jointly with local government to implement regulations and fund programs. Pursuant to the California Integrated Solid Waste Management Act of 1989, all cities in California are required to reduce the amount of solid waste disposed in landfills. The bill was passed because of the increase in waste stream and the decrease in landfill capacity. Assembly Bill 939 mandated a reduction of 25% by 1995 and 50% by 2000. Contracts that include work that will generate solid waste, including construction and demolition debris, have been targeted for participation in source-reduction, reuse, and recycling programs. Contractors are urged to manage solid waste to divert waste away from disposal in landfills (particularly Class III landfills) and to maximize source reduction, reuse, and recycling of construction and demolition debris.

Wastewater is regulated by the following agencies: *State Water Resources Control Board; Lahontan Regional Water Quality Control Board; California Department of Health Services; California Department of Pesticide Regulation; California Department of Toxic Substances; and California Department of Water Resources.*

6.17.2.3 Local

Kern County Kern County General Plan

The Kern County General Plan provides guidance on public utilities and related services (Kern County 2004a).

1.4 Public Facilities and Services Policies

- Policy 1. New discretionary development will be required to pay its proportional share of the local costs of infrastructure improvements required to service such development.
- Policy 3. Individual projects will provide availability of public utility service as per approved guidelines of the serving utility. Implementation Measures
- Implementation Measure C. Project developers shall coordinate with the local utility service providers to supply adequate public utility services.

1.9 Resources Policies

- Policy 16. The County will encourage development of alternative energy sources by tailoring its Zoning and Subdivision Ordinances and building standards to reflect Alternative Energy Guidelines published by the California State Energy Commission.
- Policy 19. Work with other agencies to define regulatory responsibility concerning energy-related issues.

1.10.1 General Provisions, Public Services and Facilities Policies

- Policy 9. New development should pay its pro rata share of the local cost of expansions in services, facilities, and infrastructure which it generates and upon which it is dependent.

- Policy 15. Prior to approval of any discretionary permit, the County shall make the finding, based on information provided by the California Environmental Quality Act (CEQA) documents, staff analysis, and the applicant, that adequate public or private services and resources are available to serve the proposed development.
- Policy 16. The developer shall assume full responsibility for costs incurred in service extension or improvements that are required to ensure the project. Cost sharing or other forms of recovery shall be available when the service extensions or improvements have a specific quantifiable regional significance.

Implementation Measures

- Implementation Measure E. All new discretionary development projects shall be subject to the Standards for Sewage, Water Supply and Preservation of Environmental Health Rules and Regulations administered by the Environmental Health Services Department. Those projects having percolation rates of less than five minutes per inch shall provide a preliminary soils study and site specific documentation that characterize the quality of upper groundwater in the project vicinity and evaluation of the extent to which, if any, the proposed use of alternative septic systems will adversely impact groundwater quality. If the evaluation indicates that the uppermost groundwater at the proposed site already exceeds groundwater quality objectives of the Regional Water Quality Control Board or would if the alternative septic system is installed, the applicant would be required to supply sewage collection, treatment, and disposal facilities.

Kern County Airport Land Use Compatibility Plan Section 1.7.1(c)

Prior to the approval of a proposal involving any type of land use development, as stated in Section 1.6.1, or other review as required by a Specific Plan, 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 of to the Joint Service Restricted R-2508 Complex that cannot be mitigated, shall not be considered consistent with this plan.

6.17.3 Impact Analysis

This section explains how potential impacts to Public Utilities associated with development of the TWRA (including the proposed Alta Wind Project) are assessed. Section 6.17.3.1 presents the significance criteria upon which impact determinations are based. This section also briefly describes the methodology for determining the type and degree of impact that would be produced as a result of TWRA development. All impacts and mitigation measures identified for development of the TWRA are presented in Section 6.17.3.2.

6.17.3.1 Criteria for Determining Impact Significance

The significance criteria listed below are applicable to public utility systems under all types of jurisdiction, including federal, state, local, and private. Development of wind projects within the TWRA, including the Alta Wind Project would result in significant impacts to Public Utilities if it would meet any of the following significance criteria:

- Criterion TWRA PU1: Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.
- Criterion TWRA PU2: 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.
- Criterion TWRA PU3**:** Result or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

- Criterion TWRA PU4**:** Have sufficient water supplies available to serve the project from existing entitlements, or are new or expanded entitlements needed.
- Criterion TWRA PU5: 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.
- Criterion TWRA PU6: Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs.
- Criterion TWRA PU7**:** Comply with federal, State, and local statutes and regulations related to solid waste.

6.17.3.2 Impacts and Mitigation Measures

The following section describes potential impacts and mitigation measures related to Public Utilities that could occur as a result of future wind project development within the TWRA (including the proposed Alta Wind Project). A summary of identified impacts and associated mitigation measures for the TWRA is presented in Table 6.20-1.

Exceed Wastewater Treatment Requirements (Criterion TWRA PU1)

Impact TWRA-PU-1: Future wind development would exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.

Long-term impacts to utilities are usually associated with population growth in an area, which increases the demand for a particular service and necessitates the expansion of existing facilities or construction of new facilities. Future wind projects would probably result in only minor population increases, as discussed in (Population and Housing). Therefore, potential future wind projects would not increase any demands on utilities.

However, construction activities of projects would require water and would generate solid waste and wastewater. As wastewater generated by construction would be limited to that generated by construction personnel and would be accommodated by portable toilets which would be emptied into municipal sewage systems or septic systems, wastewater generation would not exceed wastewater treatment requirements, nor would it require the construction or expansion of wastewater treatment facilities. The construction of turbine foundations and footings would incrementally increase non-permeable surfaces in the individual project areas, but would not increase stormwater runoff such that it would require the construction or expansion of stormwater drainage facilities. Water would be required for dust control as well as for concrete and drinking water for construction personnel, but this would be a minute fraction of the water supply for the area and would not require any new water treatment facilities nor would it require the acquisition or expansion of water entitlements. Solid waste generated by construction activities would consist largely of soil and vegetative material, along with wood from cribbing, sanitation waste, concrete waste, and other construction debris. The amount of waste generated would also be a minute fraction of the capacities of the landfills serving the TWRA and would not exceed any landfill capacities nor would it conflict with any statutes or regulations associated with solid waste.

CEQA Significance Conclusion

Any impacts to public utility systems could be adverse, but would be less than significant (Class III). Future wind development would comply with the goals, policies, and implementation measures of the Kern County General Plan. No mitigation measures would be required.

Construction of New Water or Wastewater Treatment Facilities (Criterion TWRA PU2)

Impact TWRA-PU-2: Future wind development would 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.

As discussed above, potential projects in the TWRA would not result in construction of new water or wastewater treatment facilities and therefore would not result in significant impacts.

CEQA Significance Conclusion

Future wind development would comply with the goals, policies, and implementation measures of the Kern County General Plan. Impacts would be less than significant and no mitigation measures would be required (Class III).

Construction of New Stormwater Drainage Facilities (Criterion TWRA PU3)

Impact TWRA-PU-3: Future wind development would result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

As discussed above, potential projects in the TWRA would not result in construction of new stormwater drainage and therefore would not result in significant impacts.

CEQA Significance Conclusion

Future wind development would comply with the goals, policies, and implementation measures of the Kern County General Plan. Impacts would be less than significant and no mitigation measures would be required (Class III).

Increased Water Use (Criterion TWRA PU4)

Impact TWRA-PU-4: Future wind development would have sufficient water supplies available to serve future wind projects from existing entitlements.

Water would be required for dust control as well as for concrete and drinking water for construction personnel, but this would be a minute fraction of the water supply for the area and would not require any new water treatment facilities nor would it require the acquisition or expansion of water entitlements.

CEQA Significance Conclusion

Future wind development would comply with the goals, policies, and implementation measures of the Kern County General Plan. Impacts would be less than significant and no mitigation measures would be required (Class III).

Need for Increased Wastewater Treatment (Criterion TWRA PU5)

Impact TWRA-PU-5: Future wind development would result in a determination by the wastewater treatment provider which serves or may serve future wind projects that it has adequate capacity to serve each future wind project's projected demand in addition to the provider's existing commitments.

Wastewater generated by construction from potential projects would be limited to that generated by construction personnel and would be accommodated by portable toilets which would be emptied into municipal sewage systems or septic systems, wastewater generation would not exceed wastewater treatment requirements, nor would it require the construction or expansion of wastewater treatment facilities.

CEQA Significance Conclusion

Future wind development would comply with the goals, policies, and implementation measures of the Kern County General Plan. Impacts would be less than significant and no mitigation measures would be required (Class III).

Increase in Solid Waste Disposal (Criterion TWRA PU6)

Impact TWRA-PU-6: Future wind development would be served by a landfill with sufficient permitted capacity to accommodate the each future wind project's solid waste disposal needs.

Solid waste generated by construction activities would consist largely of soil and vegetative material, along with wood from cribbing, sanitation waste, concrete waste, and other construction debris. The amount of waste generated would also be a minute fraction of the capacities of the landfills serving the TWRA and would not exceed any landfill capacities nor would it conflict with any statutes or regulations associated with solid waste.

CEQA Significance Conclusion

Future wind development would comply with the goals, policies, and implementation measures of the Kern County General Plan. Impacts would be less than significant and no mitigation measures would be required (Class III).

Conflict with Federal, State, and/or Local Standards Relating to Solid Waste (Criterion TWRA PU7)

Impact TWRA-PU-7: Future wind development would comply with federal, State, and local statutes and regulations related to solid waste.

As described above potential projects would not exceed landfill capacities and would implement measures prescribed in the Kern County General Plan and are expected to comply with all federal, State, and local statutes.

CEQA Significance Conclusion

Future wind development would comply with the goals, policies, and implementation measures of the Kern County General Plan. Impacts would be less than significant and no mitigation measures would be required (Class III).

6.18 Traffic and Transportation

This section addresses the potential Traffic and Transportation impacts of expected and potential wind development in the TWRA. A description of the Affected Environment for Traffic and Transportation is presented below in Section 6.18.1, followed by a description of Applicable Laws, Regulations, and Standards in Section 6.18.2, and the Impact Analysis presented in Section 6.18.3.

6.18.1 Affected Environment

The regional circulation system by the TWRA consists of State Routes 58 (SR-58) and 14 (SR-14). SR-58 (right-of-way varies between two and four lanes) runs east-west and begins in San Luis Obispo County. It enters Kern County near McKittrick, then runs east through Bakersfield and Mojave to the county boundary past Boron to end in San Bernardino County. SR-14 (right-of-way varies between two and four lanes) runs north-south and begins at Interstate 5 just north of the San Fernando Valley, and continues north into Kern County where it ends at SR-395, north of Inyokern.

The local circulation system near the TWRA consists of Tehachapi-Willow Springs Road, Backus Road, 90th Street West, Mojave Tropico Road, Oak Creek Road, Silver Queen Road, California City Boulevard, Woodford Tehachapi Road, Cummings Valley Boulevard, Highline Road, and East Tehachapi Boulevard. These roads connect with smaller paved and dirt access roads.

Table 6.18-1 presents existing traffic volumes on the highways and roadways that may be used to access future wind project sites within the TWRA. Heavy traffic currently exists along Rosamond Boulevard, located east of SR-14. The main entrance into Edwards Air Force Base is located along this road. Intersections were chosen based on where construction and daily operation personnel would likely be commuting from. It was assumed that individuals would be commuting from the cities of Lancaster and Bakersfield.

Future Wind Project Site Access

The workforce and vehicles associated with future wind project construction and operation would most likely travel to project sites via the regional and local circulation system described above. Any existing private dirt roads within future wind project sites would be used to the greatest extent possible, and as agreed to in any lease agreements with the landowner whose property the roads cross. It is anticipated that existing roads would require improvements to accommodate construction vehicle and equipment weights, widths, and turning radius requirements. Improvements would include widening roads or replacing existing culverts across drainages with larger culverts to allow for safe use by construction equipment.

The applicants of future wind projects may also need to construct new unpaved roads within the project sites where existing private roads do not provide adequate access to proposed project facilities. The applicants would construct all new access roads in accordance with Kern County engineering design requirements and would consult with Kern County prior to beginning construction.

Aircraft Traffic and Military Aviation

Several airports are located within close proximity to the TWRA. Please see Section 6.10 – Hazards and Hazardous Materials for a complete list.

Table 6.18-1. Existing Roadways

Route/Road	Description	Intersection	Direction	2006 AADT[a,b]	Peak Hour[b]
State Highway 14	Two-lane expressway (limited access highway)	Rosamond Blvd.	Northbound	35,000	3,400
		Silver Queen Rd.	Northbound	19,900	2,050
		Oak Creek Road [c]	Northbound (2004 data)	18,000	1,850
		Junction of Route 58	Northbound	19,000	2,050
State Highway 58	Two-lane expressway (limited access highway)	Junction of Route 14 South	Eastbound	14,050	1,550
		Tehachapi, Mill Street	Eastbound	22,500	3,050
		Edwards Air Force Base, Muroc Road	Eastbound	17,000	1,800
		Junction of Route 202 Southwest	Eastbound	22,500 [d]	3,050 [d]
		Summit Interchange	Eastbound	20,500 [d]	2,350 [d]
90th Street West (becomes Tehachapi-Willow Springs Rd. north of Rosamond Boulevard	Paved street	South of Rosamond Boulevard	Both	2,000	NA
Backus Road	Paved street	East of Tehachapi-Willow Springs Road	Both	660	NA
	Two-lane paved street	West of Highway 14	Both	1,750	NA
California City Boulevard	Two-lane paved street	North of Highway 58	Both	3,000	NA
Cummings Valley Boulevard	Two-lane paved street	East of Bear Valley Road	Both	10,000	NA
Highline Road	Two-lane paved street	West of Tehachapi Willow Springs Road	Both	2,800	NA
Mojave Tropico Road	Two-lane paved street	North of Rosamond Boulevard	Both	1,900	NA
		North of Backus Road	Both	430	NA
Rosamond Boulevard	Two-lane paved street	West of Tehachapi-Willow Springs Road	Both	550	NA
		East of 90th Street West	Both	1,300	NA
		East of Mojave Tropico Rd.	Both	4,600	NA
	Four-lane paved street	West of Highway 14	Both	19,000	NA
Silver Queen Road	Two-lane paved street	West of State Highway 14 (Midland Trail)	Both	180	NA
Tehachapi Boulevard	Two-lane paved street	West of Sand Canyon Road	Both	1,100	NA
	Two-lane paved street	West of Tehachapi Willow Springs Road	Both	4,350	NA
Tehachapi-Willow Springs Road	Two-lane paved street	North of Rosamond Boulevard	Both	2,600	NA
	Two-lane paved street	South of Highline Road	Both	4,200	NA
	Two-lane paved street	South of Tehachapi Boulevard	Both	3,050	NA
Woodford Tehachapi Road	Two-lane paved street	North of State Highway 202	Both	4,500	NA

Sources: California Department of Transportation 2007; Kern County Road Department 2007 (data for 2006).
Notes: AADT = annual average daily traffic; NA = not available.
[a] ADT for 2004. Average daily traffic is provided for local roads.
[b] AADT and peak-hour counts taken for traffic just prior to intersection. For example, at the intersection of Rtes. 14 and 58, vehicles traveling to the site are moving from Rte. 14 north to Rte 58. As such, "back" AADT and peak-hour counts were used because "back" counts usually represent traffic south or west of the intersection, and vehicles would be traveling from the south.
[c] Information taken from PdV Draft EIR, Section 4.15, Table 4.15-1(Power Partners Southwest, LLC, 2007).
[d] AADT and peak-hour counts taken for traffic just prior to intersection. Unlike the "back" AADT and peak-hour counts used for the other highway intersections, "ahead" counts were used here because they usually represent traffic north or east of the intersection, and vehicles would be traveling from the north at these locations.

Alta Wind Project

The proposed Alta Wind Project is located within the southern portion of the TWRA. The setting described above for the TWRA analysis applies to the Alta Wind Project as well. During construction,

regional access to the project site would be provided by SR-14 to the east and SR-58 from the north. Project-related traffic would use Tehachapi-Willow Springs Road and Oak Creek Road, which are designated as Freeway/Expressway and Arterial/Major Highway alignments, respectively, by the Circulation Element of the Kern County General Plan. The closest airport to the Alta Wind Project site is the Mountain Valley Airport, located approximately 1.5 miles to the northwest.

6.18.2 Applicable Regulations, Plans, and Standards

6.18.2.1 Federal

Activities associated with development of the TWRA (including the proposed Alta Wind Project) would be subject to the same Federal requirements as specified in Section 3.13 (Traffic and Transportation). The TWRA (including the proposed Alta Wind Project) does not include National Forest System lands, and is therefore not subject to the USDA Forest Service Land Management Plan (FLMP).

6.18.2.2 State

Activities associated with development of the TWRA (including the proposed Alta Wind Project) would be subject to the same State requirements as specified in Section 3.13 (Traffic and Transportation).

6.18.2.3 Local

Activities associated with development of the TWRA (including the proposed Alta Wind Project) would be subject to the same local requirements as specified in Section 3.13 (Traffic and Transportation). However, as opposed to the proposed TRTP, which crosses through several different counties, the TWRA (including the proposed Alta Wind Project) is situated entirely within Kern County and is therefore only subject to Kern County regulations and requirements.

6.18.3 Impact Analysis

This section explains how potential impacts to Traffic and Transportation associated with development of the TWRA (including the proposed Alta Wind Project) are assessed. Section 6.18.3.1 presents the significance criteria upon which impact determinations are based. This section also briefly describes the methodology for determining the type and degree of impact that would be produced as a result of TWRA development. All impacts and mitigation measures identified for development of the TWRA are presented in Section 6.18.3.2.

6.18.3.1 Criteria for Determining Impact Significance

Impact significance is assessed based on criteria derived from the Kern County Initial Study Checklist. Traffic and Transportation impacts would be considered significant if activities or actions associated with development of the TWRA (including the proposed Alta Wind Project) would:

- Criterion TWRA TRA1: 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).
- Criterion TWRA TRA2: Exceed, either individually or cumulatively, a Level of Service (LOS) standard established by the county congestion management agency or adopted County threshold for designated roads or highways. Specifically, would implementation of the project cause the LOS for roadways and/or intersections to decline below the following thresholds or further degrade already degraded segments.

i: Metropolitan Bakersfield General Plan LOS "C"

ii: Kern County General Plan LOS "D"

- Criterion TWRA TRA3: 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.
- Criterion TWRA TRA4: Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Criterion TWRA TRA5: Result in inadequate emergency access.
- Criterion TWRA TRA6: Result in inadequate parking capacity.
- Criterion TWRA TRA7: Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

6.18.3.2 Impacts and Mitigation Measures

The following section describes potential impacts and mitigation measures related to Traffic and Transportation that could occur as a result of development of the TWRA (including the proposed Alta Wind Project). A summary of identified impacts and associated mitigation measures for the TWRA is presented in Table 6.20-1.

Increases in Vehicle Trips or Volume to Capacity Ratios (Criterion TWRA TRA1)

Impact TWRA-TRA-1: Future wind development would cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system.

During construction, future wind projects would cause temporary, short-term increases in local traffic as a result of construction-related workforce traffic, which involves employees traveling to and from the project sites, heavy equipment deliveries (e.g., cranes and bulldozers), and material deliveries (e.g., gravel and concrete). The TWRA is located in a remote, rural area where the existing volume of traffic on local roadways is low. The addition of construction-related traffic from future wind projects is not anticipated to cause the existing level of service on local roadways to exceed service capacity. In addition, traffic is expected to be distributed among several roads depending on the specific location of each future wind project. Additionally, future wind projects within the TWRA are not expected to all be constructed at the same time as project permitting engineering, and the availability of wind turbines may require construction of wind projects to occur years apart from each other. Therefore, construction-related traffic from multiple projects is not anticipated to occur at the same time or within the same time period.

Work hours would typically be scheduled as early as 6:30 a.m. and as late as 8:00 p.m. to allow personnel to arrive before peak morning commute traffic and to leave after peak evening commute traffic. The applicants of future wind projects are also expected to schedule construction equipment transport and deliveries to occur during the day to limit additional traffic during commuter hours. Since the increased volume of traffic is not expected to exceed capacity on the rural roads proposed for use and that the additional traffic would be temporary and relatively short-term, this impact would be less than significant.

Only 10 to 30 full-time staff would be anticipated during operation of each future wind project within the TWRA, which would contribute a small amount of traffic to the local area. Also, occasional equipment and materials deliveries would occur, but these are not anticipated to cause a significant increase in traffic. In addition, they would be scheduled outside of peak traffic hours. Long-term impacts on existing traffic in the future wind project areas of the TWRA are not anticipated. Impacts would be less than significant with the following mitigation measure.

Mitigation Measures for Impact TWRA-TRA-1

TWRA-TRA-1: The applicants of future wind projects shall schedule construction equipment transport and deliveries to occur during the day to limit additional traffic during commuter hours and shall work with the Kern County Roads Department to distribute construction traffic flow from State Highway 14 and 58 across alternative County routes.

CEQA Significance Conclusion

Implementation of Mitigation Measure TWRA-TRA-1 would reduce the potential that future wind projects within the TWRA would cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system. This measure would minimize the potential for construction traffic to disrupt the existing flow of traffic. Therefore, with the implementation of the mitigation measure described above, Impact TWRA-TRA-1 would be less than significant (Class II).

Exceedance of Level of Service Standards (Criterion TWRA TRA2)

Impact TWRA-TRA-2: Future wind development would exceed Level of Service standards established by the Metropolitan Bakersfield General Plan LOS "C".

The Level of Service (LOS) on existing County roads is now at or above the acceptable LOS D (Power Partners Southwest, LLC, 2007). A change in LOS on roadways is acceptable as long as it does not exceed LOS D or LOS C for Caltrans roadways, which would trigger mitigation. Future wind projects within the TWRA would cause a temporary increase in traffic during project construction. However, since a low volume of traffic currently exists on roads in the TWRA vicinity, additional traffic during future wind project construction would not result in an exceedance of LOS C on County roads. Similar to construction-related traffic, traffic during operation of future wind projects is not expected to affect the existing LOS on County roads. Additionally, future wind projects within the TWRA are not expected to all be constructed at the same time as project permitting and engineering, and the availability of wind turbines may require construction of wind projects to occur years apart from each other. Therefore, construction-related traffic from multiple projects is not anticipated to occur at the same time or within the same time period.

Mitigation Measures for Impact TWRA-TRA-2

Impacts would be less than significant with implementation of the mitigation measure for Impact TWRA-TRA-1, Scheduling of Construction Equipment Transport and Deliveries.

CEQA Significance Conclusion

Implementation of Mitigation Measure TWRA-TRA-1 would reduce the potential that the future wind projects within the TWRA would exceed a LOS standard established by the county or state highways. This measure would minimize the potential for construction traffic to cause a LOS for roadways or intersections to decline below existing thresholds. Therefore, with the implementation of the mitigation measure described above, Impact TWRA-TRA-2 would be less than significant (Class II).

Impact TWRA-TRA-3: Future wind development would exceed Level of Service standards established by the Kern County General Plan LOS "D".

The LOS on existing County roads is now at or above the acceptable LOS D (Power Partners Southwest, LLC, 2007). A change in LOS on roadways is acceptable as long as it does not exceed LOS D or LOS C

for Caltrans roadways, which would trigger mitigation. Future wind projects within the TWRA would cause a temporary increase in traffic during project construction. However, since a low volume of traffic currently exists on roads in the TWRA vicinity, additional traffic during future wind project construction would not result in an exceedance of LOS C on County roads. Similar to construction-related traffic, traffic during operation of future wind projects is not expected to affect the existing LOS on County roads. Additionally, future wind projects within the TWRA are not expected to all be constructed at the same time as project permitting and engineering, and the availability of wind turbines may require construction of wind projects to occur years apart from each other. Therefore, construction-related traffic from multiple projects is not anticipated to occur at the same time or within the same time period.

Mitigation Measure for Impact TWRA-TRA-3

Impacts would be less than significant with implementation of the mitigation measure for Impact TWRA-TRA-1, Scheduling of Construction Equipment Transport and Deliveries.

CEQA Significance Conclusion

Implementation of Mitigation Measure TWRA-TRA-1 would reduce the potential that the future wind projects within the TWRA would exceed a LOS standard established by the county or state highways. This measure would minimize the potential for construction traffic to cause a LOS for roadways or intersections to decline below existing thresholds. Therefore, with the implementation of the mitigation measure described above, Impact TWRA-TRA-3 would be less than significant (Class II).

Change in Air Traffic Patterns (Criterion TWRA TRA3)

Impact TWRA-TRA-4: Future wind development would cause a change in air traffic patterns that results in substantial safety risks.

The east-southeastern boundary of the TWRA is located approximately 2.0 miles west of the north-western boundary of the Edwards Air Force Base. Specific areas within the TWRA are required to limit the heights of structures to 400 feet above ground elevation (Kern County Zoning Ordinance 19.08.160). Based on conversations with Kern County, the county and military are working on an agreement to allow structures to be built to a height not to exceed 500 feet. At the time of preparation of this document, Kern County had not adopted such a change into the zoning ordinance. Since a change in building height has not been confirmed, a maximum height restriction of 400 feet has been assumed for this analysis.

Implementation of Mitigation Measure TWRA-HAZ-2 would limit turbine height to ensure that hazards resulting from the location of the future wind project sites within the TWRA in proximity to military aviation operations are less than significant. Because the turbines would be more than 200 feet tall, Mitigation Measure TWRA-HAZ-3 requires the applicants of future wind projects to submit FAA Form 7460-1, Notice of Proposed Construction or Alteration, requesting that the FAA issue a Determination of No Hazard to Air Navigation. Impacts would be less than significant with the implementation of Mitigation Measures TWRA-HAZ-5 and 6.

Mitigation Measures for Impact TWRA-TRA-3

TWRA-HAZ-5: The applicants of future wind projects (if located within specified area) within the TWRA shall limit all turbines to a height not to exceed 400 feet above ground level, unless otherwise specified by the Kern County Zoning Ordinance.

TWRA-HAZ-6: The applicants of future wind projects shall comply with all requirements to maintain the FAA's Determination of No Hazard to Air Navigation during construction and operation of the turbines. The applicants shall work with the FAA and Air Force to resolve any adverse effects on aeronautical operations prior to issuance of grading or building permits for the affected turbines or area where those disputed turbines will be constructed.

CEQA Significance Conclusion

Implementation of Mitigation Measures TWRA-HAZ-5 and 6 would reduce the potential that future wind projects within the TWRA would cause a change in air traffic patterns that would result in substantial safety risks. These measures would minimize the potential for future wind projects to interfere with military flight operations or air navigation in the future wind project areas of the TWRA. Therefore, with the implementation of the mitigation measures described above, Impact TWRA-TRA-4 would be less than significant (Class II).

Increase Hazards Due to a Design Feature (Criterion TWRA TRA4)

Impact TWRA-5: Future wind development would substantially increase hazards caused by a design feature.

The applicants of future wind projects within the TWRA would design new project access roads using standard engineering practices and design measures. During construction of future wind projects, heavy construction equipment would be used on roadways which could result in damage to roads and may increase hazards for the public and future wind project personnel. Potential hazards also exist from tracking dust, soils, and other materials from graded construction sites onto public roads. Impacts are considered potentially significant and mitigation would be required. Mitigation Measures TWRA-TRA-2 and TWRA-TRA-3 would be implemented to ensure impacts are less than significant.

Mitigation Measures for Impact TWRA-TRA-4

TWRA-TRA-2: Prior to construction, the applicants of future wind projects shall submit engineering drawings of proposed access road design for the review and approval of the Kern County Roads Department and shall obtain an encroachment permit for applicable roads.

TWRA-TRA-3: To minimize damage to existing roads that could increase hazards for the public and future wind project personnel, the applicants shall:

a. Use regulation-sized vehicles, except for specific construction equipment, which may haul oversized loads;
b. Obtain local hauling permits from appropriate agencies prior to construction and adhere to any conditions in these permits;
c. Enter into a secured agreement with Kern County to ensure that any County roads that are demonstrably damaged by project-related activities are promptly repaired and, if necessary, paved, slurry-sealed, or reconstructed as per requirements of the state and or Kern County; and
d. Post a security bond to cover the costs of road maintenance during construction.

CEQA Significance Conclusion

Implementation of Mitigation Measures TWRA-TRA-4 and 5 would reduce the potential that future wind projects within the TWRA would substantially increase hazards caused by a design feature. These measures would minimize the potential for future wind projects to increase hazards from the design and construction of new access roads. Therefore, with the implementation of the mitigation measures described above, Impact TWRA-TRA-5 would be less than significant (Class II).

Inadequate Emergency Access (Criterion TWRA TRA5)

Impact TWRA-TRA-6: Construction activities could temporarily interfere with emergency response.

As discussed in Section 6.10, Hazards and Hazardous Materials, the development of future wind projects within the TWRA would not alter any emergency access routes that currently exist or modify existing patterns of emergency access. It also would not inhibit access of emergency vehicles by requiring the closure of public roads. A significant increase in future wind project-related traffic is not anticipated and therefore would not affect the existing LOS on roads, which could indirectly affect emergency access. The extent of additional access roads that may be built during construction of future wind projects is unknown at this time. If additional access roads are built, they would aid emergency access on the future wind project sites in the event of an emergency.

However, there is a possibility that emergency services would be needed at a location where access is temporarily blocked by a construction zone or where permanent wind facility gates are locked. Advance coordination with emergency service providers in order to develop alternative routes and adjust service areas and destinations as necessary to maintain emergency service coverage and response times, would mitigate this impact to less than significant. Emergency service providers would be aware of any potential delays, lane closures, and/or roadway closures prior to construction activities and would be able to maintain emergency service coverage. Mitigation Measure TWRA-HAZ-8 would be implemented to ensure this impact is less than significant.

Mitigation Measures for Impact TWRA-TRA-6

TWRA-HAZ-8: The applicant of future wind projects shall coordinate in advance with the Kern County Emergency Medical Services Department (EMS) to avoid restricting movements of emergency vehicles. The applicant of future wind projects in coordination with the Kern County EMS shall notify respective police, fire, ambulance and paramedic services and inform Kern County of the proposed locations, nature, timing and duration of any construction activities and advise of any access restrictions such as locked gates that could impact their effectiveness during wind facility construction and operation.

CEQA Significance Conclusion

Implementation of Mitigation Measure TWRA-HAZ-8 would substantially reduce the potential that future wind projects within the TWRA would result in inadequate emergency access. This mitigation measure would allow emergency service providers to be aware of any access restrictions ahead of time. With the implementation of the mitigation measure described above, Impact TWRA-TRA-6 would be less than significant (Class II).

Inadequate Parking Capacity (Criterion TWRA TRA6)

Impact TWRA-TRA-7: Future wind development would result in inadequate parking.

Future wind projects within the TWRA are not anticipated to result in the physical displacement of existing parking. During construction of future wind projects, a limited increase in demand for parking for construction equipment and personnel vehicles would exist. However, all parking is expected to be accommodated within the future wind project sites. Parking would be made available on the future wind project sites for personnel during operation as well. Impacts are less than significant.

CEQA Significance Conclusion

Future wind development would comply with the goals, policies, and implementation measures of the Kern County General Plan. No mitigation measures are proposed.

Conflict with Programs Supporting Alternative Transportation (Criterion TWRA TRA7)

Impact TWRA-TRA-8: Future wind development would conflict with adopted policies or programs supporting alternative transportation.

Kern County currently has a regional transit program that provides a combination of demand-response, fixed-route, and inter-city transit services. However, since future wind project sites within the TWRA would be located in a remote, rural area, no public transportation would be available. Construction and operation of the future wind projects within the TWRA is not anticipated to conflict with implementation of Kern County's existing programs supporting alternative transportation.

During construction of future wind projects, the applicants may promote ride-sharing and limit mid-day trips off-site for lunch by providing food on-site. The low volume of traffic to future wind project sites during operation would not warrant a project-specific alternative transportation program. Walking or bike riding would be the likely alternate methods of transportation for the operations personnel. Impacts would be less than significant.

CEQA Significance Conclusion

Future wind development would comply with the goals, policies, and implementation measures of the Kern County General Plan. No mitigation measures are proposed.

6.19 Wilderness and Recreation

This section addresses potential impacts of the development of the TWRA on parks and recreation opportunities in the vicinity of the study area. This section also describes the environmental and regulatory settings and suggests mitigation measures to reduce impacts, where applicable. A description of the Affected Environment for Wilderness and Recreation is presented below in Section 6.19.1, followed by a description of Applicable Laws, Regulations, and Standards in Section 6.19.2, and the Impact Analysis presented in Section 6.19.3.

6.19.1 Affected Environment

The TWRA is located in the Tehachapi Mountains, which border the north-western most portion of the Antelope Valley. The Tehachapi Mountains run between Interstate 5 and Edwards Air Force Base, north of Angeles National Forest and south of Sequoia National Forest. The majority of the study area is essentially undeveloped, but it is currently and has historically been used as grazing land for cattle.

Additionally, several existing and proposed wind development projects are located within the TWRA study area, including the proposed PdV Wind Energy Project, located in the southwestern corner of the TWRA, and the proposed Alta Wind Project, located in the middle of the TWRA, south of State Route 58 between the town of Mojave and city of Tehachapi.

A fairly dense network of existing unpaved roads traverses the study area, due primarily to the past grazing activities within the area. The surrounding area is also essentially undeveloped, with the exception of the town of Mojave (to the east) and city of Tehachapi (to the west). The recreational resources in the area are primarily in the form of open space, OHV (off-highway vehicle) roads, and walking trails.

Existing and planned recreational resources and wilderness areas within or near the TWRA were identified through the use of several existing environmental documents, including the PdV Wind Energy Project EIR, the Pine Tree EIR, and the Antelope Transmission Project 2&3 EIR. Additionally, both internet searches and consultations with Kern County were used to identify recreational resources that were not identified in existing environmental documents.

The regional setting for this analysis was mainly limited to wilderness areas and recreational resources that fall within or near the TWRA. Any recreational resources within 10 miles were considered nearby resources. Additionally, resources of particular regional or national importance that are further than 10 miles from the TWRA, such as Sequoia National Park, were considered. See Figure 6.19-1 for key recreational resources within or near the TWRA.

6.19.1.1 Federal

The TWRA, including the Alta Wind Project, is roughly bisected from the north to the south by the Pacific Crest National Scenic Trail (PCT). The PCT is 2,650 miles long, extending from Mexico to Canada and running generally along the north-south oriented mountain ridges of California (Sierra Nevada), Oregon, and Washington (Cascade Range). The PCT crosses three national monuments, seven national parks, 24 national forests, and 33 federally mandated wildernesses. In 1968, the United States Congress designated the PCT as one of the first scenic trails in the National Trails System (PCT, 2005). Use of the PCT is limited to non-mechanized means of travel. Every year, thousands of hikers and horseback riders use some portion of the PCT and approximately 300 through-hikers attempt to complete the entire trail in a single season (PCTA, 2007a).

The Pacific Crest Trail Association (PCTA) is a non-profit membership group dedicated to the preservation and protection of the trail. In 1993, the PCTA signed a Memorandum of Understanding (MOU) with the USDA Forest Service and other land management agencies including the US Department of Interior (DOI), the National Park Service (NPS), and the Bureau of Land Management (BLM). This MOU identifies the PCTA as the federal government's "major partner" in the management of the PCT (PCTA, 2007b). As described in the PCTA's Strategic Plan, which was approved on July 15, 2006, the PCTA's mission is to "…protect, preserve, and promote the Pacific Crest National Scenic Trail as an internationally significant resource for the enjoyment of hikers and equestrians, and for the value that wild and scenic lands provide to all people" (PCTA, 2006).

The northeastern most portion of the TWRA lies near to the southwestern boundary of the Jawbone-Butterbredt Area of Critical Environmental Concern (ACEC). This area, which consists of both public and private property, has been designated as an ACEC by the BLM because of its cultural and wildlife values. Within the southern portion of the ACEC, the Jawbone Canyon Open Area is a

designated off-highway vehicle use area managed by the BLM. It is located on over 7,000 acres along both sides of Jawbone Canyon Road from SR-14 west approximately 6 miles. There is a BLM visitors' center located on Jawbone Canyon Road at the entry to the Open Area at SR-14. Other than two recently installed portable toilets, there are no developed facilities within the Open Area. The area is used for open camping by recreational vehicles, motor homes, and other vehicles. The fall and winter months, especially on holiday weekends, are high use periods for the Open Area, when several thousand people may visit in a single day.

Further from the study area, several National Parks are found within the region, including Sequoia National Park, Death Valley National Park, and Mojave National Preserve

6.19.1.2 State

The California State Parks Service owns, maintains, and operates one state park (Red Rock Canyon), two state historic parks (Fort Tejon and Tomo-Kahni), and one state reserve (Tule Elk) in Kern County. All of these parks are more than 5 miles from the study area. The Red Rock Canyon State Park is situated northeast of the study area, just to the east of the Jawbone-Butterbredt ACEC, and provides visitors with camping and hiking opportunities.

6.19.1.3 Regional

Throughout surrounding Kern County, many recreational opportunities exist, including camping, hiking, horseback riding, boating and water skiing, bird watching, picnicking, and scenic viewing. The Kern County Parks and Recreation Department operates and maintains eight regional parks—the Buena Vista Aquatic Recreational Area, Greenhorn Mountain Park, Leroy Jackson Park, Kern River County Park, Lake Isabella, Lake Woollomes, Metro Recreation Center, and Tehachapi Mountain Park. These parks provide more than 19,422 acres of parkland for recreational purposes. Tehachapi Mountain Park is the only regional park near the study area. The park is located along the western boundary of the study area, south of the city of Tehachapi on the southern side of State Route 58. The Alta Wind Project lies east and southeast of the Tehachapi Mountain Park, and the westernmost portion of the Alta Wind Project borders the easternmost boundary of the park. Tehachapi Mountain Park contains 5,000 acres and offers a variety of activities, including hiking, camping, and equestrian trail riding.

6.19.1.4 Local

The Kern County Parks and Recreation Department operates and maintains 40 neighborhood parks throughout the County as well as several public buildings that also are used for recreational purposes. The neighborhood parks closest to the study area are West Mojave Park and East Mojave Park, just east of the TWRA and east-northeast of the Alta Wind Project, near the town of Mojave, as well as Rosamond Park and West Park in the City of Rosamond.

6.19.1.5 Private

The Tejon Ranch borders the TWRA along the southwest edge of the study area, just west of the Cottonwind Substation and the PdV Wind Energy Project. Tejon Ranch is a privately-owned property, encompassing more than 270,000 acres (426 square miles). The land is primarily used for private ranching and farming, although some areas have been designated for development. The Tejon Ranch Company has secured a Private Lands Wildlife Management License, as part of an extensive wildlife management program developed for the ranch in conjunction with the California Department of Fish and Game (Tejon Ranch Company, 2007). This license allows members of the public to enjoy recreational

hunting on the ranch. Hunting is conducted on a permit-basis, under conditions described in the ranch's Wildlife Management License.

Alta Wind Project

The proposed Alta Wind Project is located within the southern portion of the TWRA. The setting described above for the TWRA analysis applies to the Alta Wind Project as well. The Tehachapi Mountain Park is the primary park that would service the proposed project area. It is also the only regional park in close proximity to the proposed project. The Pacific Crest Trail, located in Kern County traverses the center of the proposed project area.

6.19.2 Applicable Laws, Regulations, and Standards

6.19.2.1 Federal

The northern portion of the TWRA includes BLM property located within the California Desert Conservation Area (CDCA) Plan boundaries. Various Multiple Use Classes have been assigned in the Plan to public lands surrounding the TWRA for the purpose of establishing land and resource management objectives and guidelines.

6.19.2.2 State

Since all State parks are more than 5 miles away from the TWRA, there are no State park regulatory requirements that would apply to the development of wind within the TWRA, including the Alta Wind Project.

6.19.2.3 Local

A Kern County Zoning Ordinance for Development Standards and Conditions requires that a minimum wind generator setback of one and one-half (1 1/2) times the overall machine height (measured from grade to the top of the structure, including the uppermost extension of any blade) shall be maintained from any publicly maintained public highway or street. A minimum wind generator setback of one (1) times the overall machine height shall be maintained from any public access easement or railroad right-of-way. A minimum wind generator setback of one hundred fifty (150) feet shall be maintained from the outermost extension of any blade to any public trail, pedestrian easement, or equestrian easement.

6.19.3 Impact Analysis

This section explains how potential impacts to Wilderness and Recreation associated with development of the TWRA (including the proposed Alta Wind Project) are assessed. Section 6.19.3.1 presents the significance criteria upon which impact determinations are based. This section also briefly describes the methodology for determining the type and degree of impact that would be produced as a result of TWRA development. All impacts and mitigation measures identified for development of the TWRA are presented in Section 6.19.3.2.

6.19.3.1 Criteria for Determining Impact Significance

Impact significance is assessed based on criteria derived from the Kern County Initial Study Checklist. Those criteria have been modified to reflect potential environmental impacts that are relevant to development of the TWRA, including development of the proposed Alta Wind Project. Wilderness and

Recreation impacts would be considered significant if activities or actions associated with development of the TWRA, including the proposed Alta Wind Project would:

- Criterion TWRA REC1: Substantially degrade parks or other recreational facilities due to the increased use of those facilities.
- Criterion TWRA REC2: Create an adverse physical effect on the environment through the construction or expansion of recreational facilities.
- Criterion TWRA REC3: Temporarily or permanently disrupt or preclude activities in a park or other recreational facility.
- Criterion TWRA REC4: Cause a long-term loss or degradation to the factors that contribute to the value of a park or recreational facility.

6.19.3.2 Impacts and Mitigation Measures

The following section describes potential direct and indirect impacts and mitigation measures related to Wilderness and Recreation that could occur as a result of projects associated with development of the TWRA, including the Alta Wind Project. A summary of identified impacts and associated mitigation measures for the TWRA is presented in Table 6.20-1.

Degradation of Parks or Other Recreational Facilities Due to the Increased Use of those Facilities (Criterion TWRA REC1)

Construction of several projects within the TWRA, including the PdV Wind Energy Project, the Alta Wind Project, and other yet unnamed projects, would result in a temporary increase in population as a result of the influx of construction workers. Up to several hundred workers could come to the region during construction of the various wind energy projects within the TWRA. During periods between work shifts, such as weekends and evenings, these construction workers would potentially use parks or other recreational facilities near the project site. It is likely that some of the construction workers associated with TWRA development would already reside in the area and would not, therefore, increase the use of parks or other recreational facilities beyond baseline levels. Because there are several parks in the project vicinity (including Tehachapi Mountain Park, Red Rock Canyon State Park, West Mojave Park, and East Mojave Park), the addition of even several hundred construction workers to the region would not likely result in a noticeable increase in use of any one park. Wind energy projects associated with the development of TWRA would likely be staggered in construction timing, thus reducing the increase in population of the area during any given month. These workers would likely be occupied with construction activities during daylight hours, further decreasing the probability of a noticeable increase in use of parks in the area.

Operation of the various wind energy projects within the TWRA would require long-term staff of approximately 50 individuals. Some of these individuals likely already would reside in the area. A noticeable long-term increase in the use of any one park in the area is not expected to occur. The Kern County General Plan requires 2.5 acres of parkland for every 1,000 residents. Currently, the ratio of parkland to residents is approximately 7 acres per 1,000 residents (Willbanks, 2006). Therefore, an increase in up to 50 people and their families would not cause this ratio to be exceeded.

Neither the temporary increase in population due to construction personnel nor the long-term increase in population due to operational staff would result in a noticeable increase in use of any one park in the area. Therefore, no degradation of parks or other recreational facilities in the area would occur, and no impact would occur as a result of the development of the TWRA.

Adverse Physical Effects from Construction or Expansion of Recreational Facilities (Criterion TWRA REC2)

None of the currently proposed or reasonably expected wind energy projects within the TWRA involve the construction or expansion of recreational facilities. Furthermore, neither the temporary nor the long-term increase in population in the area due to both construction and operation of the proposed and anticipated wind energy projects within the TWRA would result in a noticeable increase in the use of existing parks or recreational facilities, as described above under Criterion TWRA REC1. Therefore, wind energy development within the TWRA would not directly or indirectly lead to the construction or expansion of recreational facilities in the area.

Because no construction or expansion of recreational facilities in the area would be required as a result of wind energy development within the TWRA, no impact would occur.

Disruption of Activities in a Park or Other Recreational Facility (Criterion TWRA REC3)

Impact TWRA-R-1: Construction activities would temporarily disrupt use of the Pacific Crest National Scenic Trail.

As previously discussed, the TWRA is roughly bisected by the PCT. Construction activities related to wind turbine site preparation and transmission line construction would temporarily disrupt the use of or access to the PCT. The presence of heavy equipment would require the temporary re-routing or closure of the PCT. Although wind turbines would not be constructed directly adjacent to the trail, the movement of heavy equipment throughout the various project sites could present a hazard to users of the PCT and could require the temporary closure or re-routing of the PCT. Additionally, site preparation and construction activities would temporarily increase noise and dust levels, disrupting the level of sound and air quality to which the trail users are accustomed.

Mitigation Measures for Impact TWRA-R-1

TWRA-R-1 **Maintain required setback from PCT.** In conformance with the Kern County Wind Zoning Ordinance, wind energy development within the TWRA shall be designed such that all facilities other than roads and collector cables are set back 150 feet from the edges of the PCT. This would prevent the project from physically disturbing the trail. Additionally, new wind turbines shall use the surrounding topography to the maximum extent possible to minimize impacts to the PCT, including placement of new turbines beyond PCT-adjacent ridgelines and hillsides, where feasible.

CEQA Significance Conclusion

Because the PCT roughly bisects the entire TWRA, the presence of heavy equipment associated with wind energy construction activities within close proximity to the trail is inevitable. This presence would directly impact the use of the trail, and could lead to temporary closure or re-routing of the PCT in order to protect the safety of hikers and campers. No feasible mitigation exists that could prevent heavy equipment from operating within close proximity to the PCT. Therefore, the impact is significant and unavoidable (Class I).

Impact TWRA-R-2: Construction activities would temporarily disrupt the use of nearby parks.

Construction activities related to wind turbine site preparation and transmission line construction would temporarily disrupt the use of nearby parks. Several nearby parks, including the Tehachapi Mountain

Park, Mojave West Park, and Mojave East Park, would be impacted by development of the TWRA. Construction-related traffic would increase noise and congestion levels on roadways that serve these surrounding parks. However, it is not anticipated that any of the roads that are used to access surrounding parks would be closed as a result of construction activities within the TWRA, and therefore access to the surrounding parks would not be precluded. The installation of new wind turbines in close proximity to nearby parks, particularly Tehachapi Mountain Park, would raise noise and dust levels above baseline conditions. However, because of the large size of the Tehachapi Mountain Park, the relatively small number of turbines that would be installed directly adjacent to the park, and the temporary nature of construction activities, any increase in noise or dust levels would be very small and would not substantially disrupt use of the park.

CEQA Significance Conclusion

Because access to parks that surround the TWRA would be maintained during construction activities, and because any increase in noise or dust levels would be small and temporary, any disruption of the use of nearby parks would be less than significant (Class III).

Long-term Loss or Degradation to the Value of a Park or Recreational Facility (Criterion TWRA REC4)

Impact TWRA-R-3: Future wind development operation would permanently degrade the quality of the Pacific Crest National Scenic Trail.

As previously discussed, the TWRA is roughly bisected by the PCT. This impact discussion addresses the potential loss or degradation of physical attributes of the PCT as well as the potential loss or degradation of the aesthetic qualities of the surrounding wilderness that trail users have come to expect. Aesthetic impacts are addressed here under a recreational analysis of the TWRA because the PCT is designated as a National Scenic Trail and therefore the aesthetic quality of the wilderness within the TWRA is directly related to the recreational quality of the PCT.

The PCT would be physically affected by the wind energy projects within the TWRA if any of the following events were to occur in connection with project construction or operation: permanent closure of parts of the trail; installation of wind facility infrastructure within or adjacent to the trail in a way that would prevent that area from being used in the future; any other wind-related activity that would physically remove parts of the PCT from use, including fencing around wind energy project sites. Effects to the recreational experience of the PCT would include the following: installation of infrastructure which would contrast substantially with natural aesthetics currently existing along the PCT, such as a vast increase in the number of wind turbines and transmission towers; introduction of noise levels that would be substantially greater or have substantially different characteristics than that which currently exists along the PCT; any other wind-related activity that would substantially contrast with the existing wilderness experience of the PCT. As described here, visual resources and noise both contribute to the recreational experience of the PCT. However, visual and noise aspects of wind energy projects within the TWRA are only discussed here in terms of the recreational experience of the PCT, not in terms of specific Visual and Noise impacts that would be introduced by the various wind energy projects. Please see the Aesthetics and Noise sections of this programmatic analysis for the identification and discussion of specific wind development related impacts to visual resources and noise, respectively.

Although several wind energy projects currently exist within the TWRA and are included as part of the baseline conditions for this programmatic analysis, installation of over 1,000 new wind turbines and the

associated transmission lines would substantially alter the existing visual landscape. Similarly, the addition of over 1,000 new wind turbines, at potential heights ranging from 300 to 500 feet, within the TWRA would substantially increase noise levels along the PCT above baseline conditions. Installation of fencing around wind energy development projects within the TWRA would change the visual character of the landscape surrounding the PCT. Also, if the fencing is not properly designed, access to the PCT could be disrupted or restricted.

Mitigation Measures for Impact TWRA-R-3

TWRA-R-1 **Maintain required setback from PCT.** (See full description under discussion for Impact TWRA-R-1)

TWRA-R-2 **Design project fencing to maintain access to PCT.** All fences around wind energy projects within the TWRA shall be designed to maintain access to the PCT. Any crossing of the PCT by a fence shall include a gate that is easily passable by humans. Any required gates shall remain unlocked at all times.

CEQA Significance Conclusion

Programmatic development of the TWRA would introduce over 1,000 new wind turbines and would substantially alter the landscape of the area. The visual and auditory quality of the wilderness surrounding the PCT would be degraded beyond baseline conditions. Additionally, any fences that are installed in connection with wind energy projects would also degrade the visual quality of the surrounding wilderness and could disrupt or restrict access to the PCT if not properly designed. Although introduction of mitigation measures TWRA-R-1 and TWRA-R-2 would reduce the severity of these impacts, the degradation of the recreational quality of the PCT and surrounding wilderness would be significant and unavoidable (Class I).

Impact TWRA-R-4: Future wind development operation would permanently degrade the quality of nearby parks.

Several nearby parks, including Mojave West Park and Mojave East Park, enjoy clear views of the Tehachapi Mountains. Although several wind energy projects currently exist within the TWRA and are included as part of the baseline conditions for this programmatic analysis, installation of over 1,000 new wind turbines and the associated transmission lines would substantially alter the existing visual landscape seen from those nearby parks. However, although the view from those parks would be altered, no physical changes to the park facilities would result from wind energy development within the TWRA.

CEQA Significance Conclusion

Because no physical change would occur to the nearby parks and associated facilities (sports fields, restrooms, etc.), the quality of the primary attributes of those parks would not be degraded. Although the view from those parks would be degraded from baseline conditions, this degradation would not affect the primary recreational value of those parks and the impact would be less than significant (Class III).

6.20 Summary of Impacts and Mitigation Measures for the TWRA Study Area

Introduction

A summary of identified impacts and associated mitigation measures for future wind development within the TWRA is presented in Table 6.20-1 below. For a complete discussion on the impacts and the full text of the mitigation measures for each of the 16 issue areas, please see Section 6.4 through 6.19 of this report.

Table 6.20-1. Summary of Impacts and Mitigation Measures for the TWRA Study Area

Significance Criteria	Impact Statements	Mitigation Measures
Aesthetics		
Effects on Scenic Vistas (Criterion TWRA AES1)	Existing visual character of the area would be altered (Impact TWRA-AES-1).	No feasible mitigation measures can be implemented to preserve the natural condition of potential project sites.
Degradation of Existing Visual Character or Quality (Criterion TWRA AE3)	The construction of the wind facility site would degrade the existing visual character or quality of the site and its surroundings (Impact TWRA-AES-3).	No feasible mitigation measures can be implemented to preserve the existing visual character of potential project sites.
Light or Glare Effects on Daytime or Nighttime Views (Criterion TWRA AES4)	Continuous lighting atop the wind turbines and security lighting for office and maintenance buildings would change the night sky view and would substantially change the aesthetic character of the rural area (Impact TWRA-AES-4).	• The applicant shall file a Notice of Construction with the FAA for the project. The applicant shall install lighting on turbines for aviation warning in accordance with FAA requirements only. The turbines shall not be lighted for other reasons (MM TWRA-AES-1). • All exterior lighting on the O&M building and on site fencing shall be shielded to minimize the impacts on the night sky (MM TWRA-AES-2).
Agriculture		
Conversion of Prime or Unique Farmland or Farmland of Statewide Importance to Nonagricultural Use (Criterion TWRA AG1)	The TWRA area is composed entirely of lands classified as "other land" and "grazing land." The potential projects would not convert Important Farmland to nonagricultural uses (Impact TWRA-AG-1).	N/A
Conflicts with Williamson Act Contract Lands (Criterion TWRA AG2)	Assuming that future projects would comply with the goals, policies, and implementation measures of the Kern County General Plan, potential wind farm projects would not result in the cancellation of an open-space or Williamson contract (Impact TWRA-AG-2).	N/A
Conversion of Farmland to Nonagricultural Use (Criterion TWRA AG3)	The land within the TWRA is not Prime Farmland, Unique Farmland, or Farmland of Statewide Importance; and potential projects would not change the existing base zone of Exclusive Agriculture (Impact TWRA-AG-3).	N/A
Cancellation of Open Space Contracts (Criterion TWRA AG4)	The TWRA project area is in conformance with the California Land Conservation Act of 1965 and is not covered by any open space contract or Farmland Security Zone (Impact TWRA-AG-4).	N/A

Table 6.20-1. Summary of Impacts and Mitigation Measures for the TWRA Study Area

Significance Criteria	Impact Statements	Mitigation Measures
Air Quality		
Conflict with or Obstruct Implementation of the Applicable Air Quality Plan (Criterion TWRA AIR1)	During construction, future wind project development would exceed established emission thresholds and, therefore, would conflict with the Air Quality Management Plan (Impact TWRA-AQ-1).	• Future applicants shall develop a Fugitive Dust Control Plan in compliance with KCAPCD Rule 402 to reduce PM10 and PM2.5 emissions during construction (MM TWRA-AIR-1). • Future applicants shall reduce exhaust emissions during construction and, in particular, emissions of NOX, when using construction equipment and vehicles by implementing the measures identified above for the TWRA (MM TWRA-AIR-2). • Future applicants shall educate construction personnel on the health effects of exposure to criteria pollutant emissions (MM TWRA-AIR-3). • Future applicants shall provide construction workers with personal protective equipment such as respiratory equipment (masks), if requested by the worker to reduce exposure to pollutants and Valley Fever. Applicants shall provide all construction personnel and visitors to the project site with information regarding Valley Fever. This would facilitate recognition of symptoms of Valley Fever and earlier treatment (MM TWRA-AIR-4).
Violation of Air Quality Standards or Contribution to Air Quality Violations (Criterion TWRA AIR2)	Future Project development would result in temporary emissions of NOX and PM10 during construction and would exceed the KCAPCD thresholds (Impact TWRA-AQ-2).	• MM TWRA-AIR-1 and TWRA-2 identified above would reduce the production of PM10, PM2.5, and NOX from construction activities. However, during construction; these emissions would still exceed the KCAPCD significance threshold.
Violation of KCAPCD Adopted Thresholds (Criterion TWRA AIR3)	Future wind development construction would result in cumulatively considerable net increases of NOX and PM10 (Impact TWRA-AQ-3).	• MM TWRA-AIR-1 and TWRA-2 identified above would reduce PM10 and PM2.5 and NOX emissions during construction and potential project would conform with the goals, policies, and implementation measures of the Kern County General Plan and the WE Combining District impacts during construction would remain significant and unavoidable.
Exposure of Sensitive Receptors to Substantial Pollutant Concentrations (Criterion TWRA AIR4)	Sensitive receptors would be exposed to substantial pollutant concentrations during construction (Impact TWRA-AQ-4).	• Future applicants shall educate construction personnel on the health effects of exposure to criteria pollutant emissions (MM TWRA-AIR -3). • Applicants shall provide construction workers with personal protective equipment such as respiratory equipment (masks), if requested by the worker to reduce exposure to pollutants and Valley Fever. Applicants shall provide all construction personnel and visitors to the project site with information regarding Valley Fever. This would facilitate recognition of symptoms of Valley Fever and earlier treatment (MM TWRA-AIR -4).
Objectionable Odors (Criterion TWRA AIR5)	Future Project development construction would create odors associated with vehicle and engine exhaust and fueling. Given the size of the project area and strong prevailing winds in the area, these odors would be dispersed and would not create significant objectionable odors (Impact TWRA-AQ-5).	N/A

Table 6.20-1. Summary of Impacts and Mitigation Measures for the TWRA Study Area

Significance Criteria	Impact Statements	Mitigation Measures
Biological Resources		
Candidate, Sensitive, or Special-Status Species (Criterion TWRA BIO1)	Construction activities would result in direct or indirect loss of listed or sensitive plants or a direct loss of habitat for listed or sensitive plants. (Impact TWRA-BIO-1)	• Provide restoration/compensation for affected sensitive vegetation communities (MM TWRA-BIO-1a) • Conduct biological monitoring (MM TWRA-BIO-1b) • Perform protocol surveys (MM TWRA-BIO-1c) • Train project personnel (MM TWRA-BIO-1d) • Construction and survey activities shall be restricted based on final design engineering drawings (MM TWRA-BIO-1e) • Build access roads at right angles to streambeds and washes (MM TWRA-BIO-1f) • Comply with all applicable environmental laws and regulations (MM TWRA-BIO-1g) • Restrict the construction of access and spur roads (MM TWRA-BIO-1h) • Protect and restore vegetation (MM TWRA-BIO-1i) • Avoid sensitive features (MM TWRA-BIO-1j) • Conduct rare plant surveys, and implement appropriate avoidance/minimization/ compensation strategies. (MM TWRA-BIO-1k) • Delineate sensitive plant populations (MM TWRA-BIO-1l) • No collection of plants or wildlife (MM TWRA-BIO-1m) • Salvage sensitive species for replanting or transplanting (MM TWRA-BIO-1n)
	Construction activities, including the use of access roads, would result in disturbance to wildlife and result in wildlife mortality (Impact TWRA-BIO-2)	• Provide restoration/compensation for affected sensitive vegetation communities (MM TWRA-BIO-1a) • Conduct biological monitoring (MM TWRA-BIO-1b) • Construction and survey activities shall be restricted based on final design engineering drawings (MM TWRA-BIO-1e) • Restrict the construction of access and spur roads (MM TWRA-BIO-1h) • Identify environmentally sensitive times and locations for tree trimming (MM TWRA-BIO-2a) • Littering is not allowed (MM TWRA-BIO-2b) • Survey areas for brush clearing (MM TWRA-BIO-2c) • Protect mammals and reptiles overnight in excavated areas. (MM TWRA-BIO-2d) • Reduce construction night lighting on sensitive habitats (MM TWRA-BIO-2e) • Cover all steep-walled trenches or excavations used during construction to prevent the entrapment of wildlife (e.g., reptiles and small mammals) (MM TWRA-BIO-2f)
	Construction activities would result in direct or indirect loss of listed or sensitive wildlife or a direct loss of habitat for listed or sensitive wildlife (Impact TWRA-BIO-3)	• Provide restoration/compensation for affected sensitive vegetation communities (MM TWRA-BIO-1a) • Conduct biological monitoring (MM TWRA-BIO-1b) • Perform protocol surveys (MM TWRA-BIO-1c) • Train project personnel (MM TWRA-BIO-1d) • Construction and survey activities shall be restricted based on final design engineering drawings (MM TWRA-BIO-1e) • Comply with all applicable environmental laws and regulations (MM TWRA-BIO-1g) • Restrict the construction of access and spur roads (MM TWRA-BIO-1h) • No collection of plants or wildlife (MM TWRA-BIO-1m) • Identify environmentally sensitive times and locations for tree trimming (MM TWRA-BIO-2a)

Table 6.20-1. Summary of Impacts and Mitigation Measures for the TWRA Study Area

Significance Criteria	Impact Statements	Mitigation Measures
		• Littering is not allowed (MM TWRA-BIO-2b) • Survey areas for brush clearing (MM TWRA-BIO-2c) • Protect mammals and reptiles overnight in excavated areas. (MM TWRA-BIO-2d) • Reduce construction night lighting on sensitive habitats (MM TWRA-BIO-2e) • Cover all steep-walled trenches or excavations used during construction to prevent the entrapment of wildlife (e.g., reptiles and small mammals) (MM TWRA-BIO-2f) • Survey for bat nursery colonies (MM TWRA-BIO-3)
Candidate, Sensitive, or Special-Status Species (Criterion TWRA BIO1)	Direct or indirect loss of Mojave ground squirrel or direct loss of habitat (Impact TWRA-BIO-4)	• Provide restoration/compensation for affected sensitive vegetation communities (MM TWRA-BIO-1a) • Conduct biological monitoring (MM TWRA-BIO-1b) • Conduct focused surveys for Mohave ground squirrels (MM TWRA-BIO-4a) • Implement Construction Monitoring and Worker Environmental Awareness Program. (MM TWRA-BIO-4b) • Preserve Off-site Habitat for Mohave Ground Squirrel (MM TWRA-BIO-4c)
	Direct or indirect loss of Desert tortoise or direct loss of habitat (Impact TWRA-BIO-5)	• Provide restoration/compensation for affected sensitive vegetation communities (MM TWRA-BIO-1a) • Conduct biological monitoring (MM TWRA-BIO-1b) • Obtain Technical Assistance from the USFWS for Desert Tortoise (MM TWRA-BIO-5a) • Conduct Focused Clearance Surveys in Designated Areas (TWRA-BIO-5b)
	Direct or indirect loss of California condor or direct loss of habitat (Impact TWRA-BIO-6)	• Provide restoration/compensation for affected sensitive vegetation communities (MM TWRA-BIO-1a) • Littering is not allowed (MM TWRA-BIO-2b)
	Construction activities would result in a potential loss of nesting birds. (violation of the Migratory Bird Treaty Act) (Impact TWRA-BIO-7)	• Construction and survey activities shall be restricted based on final design engineering drawings (MM TWRA-BIO-1e) • Build access roads at right angles to streambeds and washes (MM TWRA-BIO-1f) • Comply with all applicable environmental laws and regulations (MM TWRA-BIO-1g) • Restrict the construction of access and spur roads (MM TWRA-BIO-1h) • Avoid sensitive features (MM TWRA-BIO-1j) • Identify environmentally sensitive times and locations for tree trimming (MM TWRA-BIO-2a) • Survey areas for brush clearing (MM TWRA-BIO-2c) • Conduct pre-construction surveys and monitoring for breeding birds (MM TWRA-BIO-7a) • Removal of raptor nests (MM TWRA-BIO-7b)
	Presence of Transmission Lines May Result in Electrocution of, and/or Collisions by, Listed or Sensitive Bird Species (Impact TWRA-BIO-8)	• Construct to 2006 APLIC Guidelines (MM TWRA-BIO-8a) • Utilize Collision-Reducing Techniques (MM TWRA-BIO-8b)
Candidate, Sensitive, or Special-Status Species (Criterion TWRA BIO1)	Presence of transmission lines would result in increased predation of listed and sensitive wildlife species by ravens that nest on transmission towers (Impact TWRA-BIO-9)	• Littering is not allowed (MM TWRA-BIO-2b) • Prepare and implement a raven control plan (TWRA-BIO-9)

Table 6.20-1. Summary of Impacts and Mitigation Measures for the TWRA Study Area

Significance Criteria	Impact Statements	Mitigation Measures
	Maintenance activities would result in disturbance to wildlife and wildlife mortality (Impact TWRA-BIO-10)	• Construction and survey activities shall be restricted based on final design engineering drawings (MM TWRA-BIO-1e) • Comply with all applicable environmental laws and regulations (MM TWRA-BIO-1g) • Restrict the construction of access and spur roads (MM TWRA-BIO-1h) • No collection of plants or wildlife (MM TWRA-BIO-1m) • Identify environmentally sensitive times and locations for tree trimming (MM TWRA-BIO-2a) • Littering is not allowed (MM TWRA-BIO-2b) • Survey areas for brush clearing (MM TWRA-BIO-2c) • Conduct maintenance activities outside the general avian breeding season (MM TWRA-BIO-10a) • Implement Weed Control Measures (MM TWRA-BIO-10b) • Landscape with Native or Non-invasive Plant Species (MM TWRA-BIO-10c)
	Operation of the wind developments would lead to avian mortality from collision with turbines (Impact TWRA-BIO-11)	• Implement measures to reduce avian and bat impacts from turbine activities (MM TWRA-BIO-11a) • Implement a construction Avian/Bat Mortality Monitoring program (MM TWRA-BIO-11b) • Conduct post-construction breeding monitoring (MM TWRA-BIO-11C)
	Operation of the wind component would lead to bat mortality from collision with turbines (Impact TWRA-BIO-12)	• Implement measures to reduce avian and bat impacts from turbine activities (MM TWRA-BIO-11a) • Implement a construction Avian/Bat Mortality Monitoring program (MM TWRA-BIO-11b) • Conduct post-construction breeding monitoring (MM TWRA-BIO-11C)
Riparian Habitat and Other Sensitive Natural Communities (Criterion TWRA BIO2)	Construction activities would result in temporary or permanent loss of native vegetation communities (Impact TWRA-BIO-13)	• Provide restoration/compensation for affected sensitive vegetation communities (MM TWRA-BIO-1a) • Conduct biological monitoring (MM TWRA-BIO-1b) • Perform protocol surveys (MM TWRA-BIO-1c) • Train project personnel (MM TWRA-BIO-1d) • Construction and survey activities shall be restricted based on final design engineering drawings (MM TWRA-BIO-1e) • Build access roads at right angles to streambeds and washes (MM TWRA-BIO-1f) • Comply with all applicable environmental laws and regulations (MM TWRA-BIO-1g) • Restrict the construction of access and spur roads (MM TWRA-BIO-1h) • Protect and restore vegetation (MM TWRA-BIO-1i)
	Construction and operation/maintenance activities would result in the introduction of invasive, non-native, or noxious plant species (Impact TWRA-BIO-14)	• Provide restoration/compensation for affected sensitive vegetation communities (MM TWRA-BIO-1a) • Protect and restore vegetation (MM TWRA-BIO-1i) • Implement weed control measures (MM TWRA-BIO-10b) • Landscape with native or non-invasive plant species (TWRA-BIO-10c)
	Construction activities would create dust that would result in degradation of vegetation (Impact TWRA-BIO-15)	• Restrict the construction of access and spur roads (MM TWRA-BIO-1h)

Table 6.20-1. Summary of Impacts and Mitigation Measures for the TWRA Study Area

Significance Criteria	Impact Statements	Mitigation Measures
Federally Protected Wetlands (Criterion TWRA BIO3)	Construction activities would result in adverse effects to jurisdictional waters and wetlands through vegetation removal, placement of fill, erosion, sedimentation, and degradation of water quality (Impact TWRA-BIO-16)	• Conduct biological monitoring (MM TWRA-BIO-1b) • Build access roads at right angles to streambeds and washes (MM TWRA-BIO-1f) • Provide restoration/compensation for affected jurisdictional areas (MM TWRA-BIO-16)
Interference with the Fish or Wildlife Movement, Migration Corridors, or the Use of Native Wildlife Nursery Sites (Criterion TWRA BIO4)	Adverse Effects to Linkages or Wildlife Movement Corridors, the Movement of Fish, and/or Native Wildlife Nursery Sites (Impact TWRA-BIO-17)	• Build access roads at right angles to streambeds and washes (MM TWRA-BIO-1f) • Restrict the construction of access and spur roads (MM TWRA-BIO-1h) • Avoid sensitive features (MM TWRA-BIO-1j) • Reduce construction night lighting on sensitive habitats (MM TWRA-BIO-2e) • Survey for bat nursery colonies (MM TWRA-BIO-3) • Fence individual turbines (MM TWRA-BIO-17)
Conflicts with Local Policies or Ordinances Protecting Biological Resources (Criterion TWRA BIO5)	Wind development would conflict with local policies or ordinances protecting biological resources (Impact TWRA-BIO-18)	• Provide restoration/compensation for affected sensitive vegetation communities (MM TWRA-BIO-1a)
Conflicts with Adopted Habitat Conservation Plans, Natural Community Conservation Plans, or Other Approved Habitat Conservation Plans (Criterion TWRA BIO6)	No Impacts	N/A
Cultural Resources		
Adverse Change in the Significance of a Historical or Archaeological Resource (Criterion TWRA CULT1 and 2)	Future wind development may cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5. (Impact TWRA-CULT-1)	• Records Searches, Native American Consultation, Archaeological Survey, Architectural Survey, Significance Evaluation and Impact Assessment, Technical Report/EIR Sections, Agency Consultation (MM TWRA-CULT-1)
	Future wind development may cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5. (Impact TWRA-CULT-2)	
Destruction of Unique Paleontological Resources or Unique Geologic Features (Criterion TWRA CULT3)	Future wind development may directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. (Impact TWRA-CULT-3)	• Paleontological Resource Mitigation Plan (MM TWRA-CULT-2)
Disturbance of Human Remains (Criterion TWRA CULT4)	Future wind development may disturb any human remains, including those interred outside formal cemeteries. (Impact TWRA-CULT-4)	• Coordination with Kern County Coroner and Native American Heritage Commission (MM TWRA-CULT-3)

Table 6.20-1. Summary of Impacts and Mitigation Measures for the TWRA Study Area

Significance Criteria	Impact Statements	Mitigation Measures
Geology and Soils		
Expose People or Structures to Substantial Adverse Effects Involving the Rupture of a known Earthquake Fault (Criterion TWRA GEO1)	Future wind development could expose people or structures within the TWRA to substantial adverse effects involving the rupture of a known earthquake fault (Impact TWRA-GEO-1)	TWRA-GEO-1 through TWRA-GEO-3 requires the issuance of building or grading permits, a full geotechnical study to evaluate soil conditions and geologic hazards on the project site and submit it to the Kern County Engineering and Survey Services Department for review and approval. Based on the geotechnical study, the applicant will need to implement recommended measures to minimize geologic hazards during siting of project facilities. Utility lines crossing potentially active faults shall be designed to withstand vertical and horizontal displacement based on the finding of the geotechnical study.
Expose People or Structures to Substantial Adverse Effects Involving Strong Seismic Ground Shaking (Criterion TWRA GEO2)	Future wind development could expose people or structures to substantial adverse effects involving strong seismic ground shaking (Impact TWRA-GEO-2)	With implementation of TWRA-GEO-1 through TWRA-GEO-4, Impact TWRA Geo-2 could be reduced to less than significant levels. TWRA-GEO-4 requires that a project applicant within the TWRA shall design wind turbines and all associated infrastructure to withstand substantial ground shaking.
Expose People or Structures to Substantial Adverse Effects involving Seismic-Related Ground Failure, including liquefaction (Criterion TWRA GEO3)	Future wind development could expose people or structures to substantial adverse effects involving seismic-related ground failure, including liquefaction (Impact TWRA-GEO-3)	With implementation of TWRA-GEO-1 through TWRA-GEO-4, Impact TWRA-GEO-3 could be reduced to less than significant levels.
Expose People or Structures to Substantial Adverse Effects Involving Landslides (Criterion TWRA GEO4)	Future wind development could expose people or structures to substantial adverse effects involving landslides (Impact TWRA-GEO-4)	Implementation of TWRA-GEO-5 through TWRA-GEO-9 involves an applicant designing cut/fill slopes for an adequate factor of safety, considering material type and compaction, at a ratio compatible with the known geologic conditions identified during the site-specific geotechnical study and in coordination with the Kern County Building Department. A wind energy project applicant shall also avoid locating roads and structures near landslide, mudflow areas or other unstable areas.
Result in Substantial Soil Erosion or Loss of Topsoil (Criterion TWRA GEO5)	Construction of wind energy related facilities could result in substantial soil erosion or loss of topsoil (Impact TWRA-GEO-5)	Implementation of TWRA-GEO-10 through TWRA-GEO-15 will require that each individual project within the TWRA undergo soil testing before siting facilities, implement BMP's and other measures for erosion control, conduct grading activities in conformance with Kern County Grading Codes and re-use material when possible.
Be Located on Soil that is Unstable or Expansive (Criterion TWRA GEO6)	Future wind development could be located on soil that is unstable or expansive (Impact TWRA-GEO-6)	With implementation of TWRA-GEO-1 and TWRA-GEO-2 which require an assessment of soils at each proposed project site in addition all facilities would be designed to withstand variations in soil density, Impact TWRA GEO-6 would be considered less than significant.
Be Located on soils that are incapable of supporting the use of septic tanks or alternative wastewater systems, where sewers are not available (Criterion TWRA GEO7)	Future wind development related facilities could be located on soils that are incapable of supporting the use of septic tanks or alternative wastewater systems, where sewers are not available (Impact TWRA-GEO-7)	With implementation of TWRA GEO-1 through TWRA GEO-15, project facilities including septic tanks and other wastewater systems would be sited in locations capable of supporting such facilities.

Table 6.20-1. Summary of Impacts and Mitigation Measures for the TWRA Study Area

Significance Criteria	Impact Statements	Mitigation Measures
Hazards and Hazardous Materials		
Hazards Associated with the Transport, Use, or Disposal of Hazardous Materials (Criterion TWRA HAZ1)	Future wind development would create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. (Impact TWRA-HAZ-1)	• Preparation of Hazardous Materials Business Plan (MM TWRA-HAZ-1)
	Future wind development would involve blasting that would create a hazard to project personnel. (Impact TWRA-HAZ-2)	• Attain blasting contractor who will prepare blasting plan (MM TWRA-HAZ-2)
Release of Hazardous Materials (Criterion TWRA HAZ2)	Future wind development would 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. (Impact TWRA-HAZ-3)	• Site hazardous materials at least 100 feet away from blue-line drainages (MM TWRA-HAZ-3) • Site transmission lines away from sensitive natural resources and construct containment berm around main transformer storage area and propane tanks (MM TWRA-HAZ-4)
Safety Hazards for Project located within the adopted Kern County Airport Land Use Compatibility Plan (Criterion TWRA HAZ5)	Future wind development would result in a safety hazard for people residing or working in the project area for a future wind project located within the Kern County Airport Land Use Compatibility Plan (ALUCP). (Impact TWRA HAZ-6)	• Limit all turbines to a height not to exceed 400 feet above ground level (MM TWRA-HAZ-5) • Maintain the FAA's Determination of No Hazard to Air Navigation during construction and operation of the turbines (MM TWRA-HAZ-6)
Airstrip Safety Hazards (Criterion TWRA HAZ6)	Future wind development would result in a safety hazard for people residing or working in the project area for a future wind project located within the vicinity of a private airstrip. (Impact TWRA HAZ-7)	• Maintain the FAA's Determination of No Hazard to Air Navigation during construction and operation of the turbines (MM TWRA-HAZ-6) • Coordinate with private airstrips located within 2 miles of the project site during construction and operation of the turbines (MM TWRA-HAZ-7)
Emergency Access (Criterion TWRA HAZ7)	Future wind development would impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. (Impact TWRA HAZ-8)	• Coordinate in advance with the Kern County Emergency Medical Services Department (EMS) to avoid restricting movements of emergency vehicles (MM TWRA-HAZ-8)
Exposure to Wildland Fires (Criterion TWRA HAZ8)	Future wind development would expose people or structures to a significant risk of loss, injury or death involving wildland fires. (Impact TWRA HAZ-9)	• Develop and implement a Fire Safety Plan for use during construction and operation (MM TWRA-HAZ-9)
Hazards from Turbine Operation (Criterion TWRA HAZ10)	Future wind development would result in other potential project-related hazards for project personnel or the public. (Impact TWRA HAZ-11)	• Design the project to conform to international standards, state and local building codes; Prevent safety hazards from over-speed, tower failure, electrical failure; Provide Kern County with Manufacturer's specifications (MM TWRA-HAZ-10) • Protect workers from electrical shock and other work-related accidents (MM TWRA-HAZ-11) • Prevent accidents involving the public (MM TWRA-HAZ-12)

Table 6.20-1. Summary of Impacts and Mitigation Measures for the TWRA Study Area

Significance Criteria	Impact Statements	Mitigation Measures
Hydrology and Water Quality		
Water Quality or Waste Discharge Violations (Criterion TWRA HYD1)	Construction activities would degrade surface water quality through erosion and sedimentation (Impact TWRA-H-1)	• Dry weather construction (MM TWRA-H-1a) • Minimize disturbance to stream channels (MM TWRA-H-1b) • Stream crossing construction timing (MM TWRA-H-1c) • Identify and mark sensitive areas for avoidance (TWRA-H-1d)
	Construction activities would degrade water quality through the accidental release of potentially harmful or hazardous materials (Impact TWRA-H-2)	• Dry weather construction (MM TWRA-H-1a) • Minimize disturbance to stream channels (MM TWRA-H-1b) • Stream crossing construction timing (MM TWRA-H-1c) • Identify and mark sensitive areas for avoidance (MM TWRA-H-1d) • Groundwater dewatering and remediation (MM TWRA-H-2a) • Groundwater testing and treatment before disposal (MM TWRA-H-2b) • Inspection and maintenance of vehicle spill kits (MM TWRA-H-2c) • No storage of fuels and hazardous materials near sensitive water resources (MM TWRA-H-2d) • Proper disposal and clean-up of hazardous materials (MM TWRA-H-2e)
	Operation and maintenance activities would degrade water quality through the accidental release of potentially harmful or hazardous materials (Impact TWRA-H-3)	• Identify and mark sensitive areas for avoidance (MM TWRA-H-1d) • Inspection and maintenance of vehicle spill kits (MM TWRA-H-2c) • No storage of fuels and hazardous materials near sensitive water resources (MM TWRA-H-2d) • Proper disposal and clean-up of hazardous materials (MM TWRA-H-2e)
Depletion of Groundwater Supplies or Interference with Groundwater Recharge (Criterion TWRA HYD2)	No Impacts	N/A
Siltation or Erosion through Alteration of Existing Drainage Pattern (Criterion TWRA HYD3)	Project structures would cause erosion, sedimentation, or other flood-related damage by impeding flood flows (Impact TWRA-H-4)	• Minimize disturbance to stream channels (MM TWRA-H-1b) • Identify and mark sensitive areas for avoidance (MM TWRA-H-1d) • Tower design for natural drainage (MM TWRA-H-4)
Flooding through Alteration of Existing Drainage Pattern or Increased Rate or Amount of Surface Runoff (Criterion TWRA HYD4)	No Impacts	N/A
Exceed Capacity of Stormwater Drainage Systems or Substantially Increase Polluted Runoff (Criterion TWRA HYD5)	No Impacts	N/A
Substantially Degrade Water Quality (Criterion TWRA HYD6)	No Impacts	N/A

Table 6.20-1. Summary of Impacts and Mitigation Measures for the TWRA Study Area

Significance Criteria	Impact Statements	Mitigation Measures
Place Housing within a 100-Year Flood Hazard Area (Criterion TWRA HYD7)	No Impacts	N/A
Impede or Redirect Flood Flows within a 100-Year Flood Hazard Area through Placement of Structures (Criterion TWRA HYD8)	No Impacts	N/A
Introduce Risk of Loss, Injury, or Death through Flooding Related to Failure of a Levee or Dam (Criterion TWRA HYD9)	No Impacts	N/A
Damage from Inundation by Seiche, Tsunami, or Mudflow (Criterion TWRA HYD10)	Project structures would be inundated by mudflow (Impact TWRA-H-5)	Dry weather construction (MM TWRA-H-1a)
Land Use		
Physically Divide an Established Community (Criterion TWRA LU1)	N/A	N/A
Conflict with any applicable Land Use Plan, Policy, or Regulation (Criterion TWRA LU2)	Future wind development may conflict with an applicable Land Use Plans, Policies, or Regulations (Impact TRWA-LU-2)	If a proposed project within the TWRA requires a zone change to allow for the WE Combining District, then • Individual project applicants shall submit the final project design in plot plans for review and approval by the Kern County Planning Department. • In its final review, the Planning Department must confirm that an individual project's facilities are installed only within the area surveyed for environmental resources and that the facilities are sited in areas and in the appropriately zoned and approved areas.
Conflict with any Applicable Habitat Conservation Plan or Natural Community Conservation Plan (Criterion TWRA LU3)	N/A	N/A
Mineral Resources		
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 (Criterion TWRA MR1)	Construction and operation activities would interfere with access to known mineral resources or county permitted mines (Impact TWRA-MR-1)	• Coordinate with quarry operations (MM TWRA-MR-1)
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 (Criterion TWRA MR2)	Future wind development would traverse resource land designated by the Kern County General Plan (Impact TWRA-MR-2)	• Avoid traversing areas designated as Map Code 8.4 [Mineral and Petroleum] (MM TWRA-MR-2)

Table 6.20-1. Summary of Impacts and Mitigation Measures for the TWRA Study Area

Significance Criteria	Impact Statements	Mitigation Measures
Noise		
Expose Persons to Noise in Excess of Standards Established in the Kern County General Plan or Noise Ordinances, or Other Applicable Standards (Criterion TWRA NOI1)	Operational noise levels produced by wind turbines would violate local standards (Impact TWRA-N-1)	• Submit noise report prior to construction (MM TWRA-N-1a) • Reduce low-frequency noise levels for sensitive receptors (MM TWRA-N-2a) • Prepare Operational Noise Complaint Plan (MM TWRA-N-3a)
Expose Persons to or Generate Excessive Groundborne Vibration or Groundborne Noise Levels (Criterion TWRA NOI2)	Construction activities could temporarily expose residences or other sensitive receptors to excessive groundborne vibration (Impact TWRA-N-2)	N/A
Cause a Substantial Permanent Increase in Ambient Noise Levels in the Study Area above Levels Existing without the Development of the TWRA (Criterion TWRA NOI3)	Operational noise levels produced by wind turbines would exceed baseline conditions (Impact TWRA-N-3)	• Submit noise report prior to construction (MM TWRA-N-1a) • Reduce low-frequency noise levels for sensitive receptors (MM TWRA-N-2a) • Prepare Operational Noise Complaint Plan (MM TWRA-N-3a)
Cause a Substantial Temporary or Periodic Increase in Ambient Noise Levels in the TWRA above Existing Levels (Criterion TWRA NOI4)	Construction noise levels would exceed baseline conditions (Impact TWRA-N-4)	• Refrain from nighttime construction (MM TWRA-N-4a) • Cover engines and maintain mufflers (MM TWRA-N-4b) • Locate stationary construction equipment away from sensitive receptors (MM TWRA-N-4c)
Expose People Residing or Working in the TWRA to Excessive Noise Levels for a Project Located within the Kern County Airport Land Use Compatibility Plan (Criterion TWRA NOI5)	Exposure of excessive noise levels within an Airport Land Use Compatibility Plan to people residing or working in the TWRA (Impact TWRA-N-5)	• Submit background noise report and coordinate with Kern County prior to construction (MM TWRA-N-5)
Expose People Residing or Working in the Project Area to Excessive Noise Levels for a Project within the Vicinity of a Private Airstrip (Criterion TWRA NOI6)	Exposure of excessive noise levels within the Vicinity of a Private Airstrip to people residing or working in the TWRA (Impact TWRA-N-6)	• Submit background noise report and coordinate with Kern County prior to construction (MM TWRA-N-5)
Population and Housing		
Substantial Population Growth (Criterion TWRA POP1)	Future wind development would induce substantial population growth. (Impact TWRA-POP-1)	N/A
Displace Existing Housing (Criterion TWRA POP2)	N/A	N/A
Displace Existing Residents (Criterion TWRA POP3)	N/A	N/A

Table 6.20-1. Summary of Impacts and Mitigation Measures for the TWRA Study Area		
Significance Criteria	Impact Statements	Mitigation Measures
Public Services		
Increased Demand for Public Services (Criterion TWRA PS1)	Future wind development would adversely affect fire protection services. (Impact TWRA-PS-1)	N/A
	Future wind development would adversely affect police protection services. (Impact TWRA-PS-2)	N/A
	Future wind development would adversely affect school capacity. (Impact TWRA-PS-3)	N/A
	Future wind development would adversely affect parks. (Impact TWRA-PS-4)	N/A
	Future wind development would adversely affect medical services. (Impact TWRA-PS-5)	N/A
Public Utilities		
Exceed Wastewater Treatment Requirements (Criterion TWRA PU1)	Solid waste generated by construction activities would consist largely of soil and vegetative material, along with wood from cribbing, sanitation waste, concrete waste, and other construction debris. The amount of waste generated would be a minute fraction of the capacities of the landfills serving the TWRA and would not exceed any landfill capacities nor would it conflict with any statutes or regulations associated with solid waste. (Impact TWRA-PU-1)	• The applicant shall comply with the goals, policies, and implementation measures of the Kern County General Plan. No mitigation measures would be required.
Construction of New Water or Wastewater Treatment Facilities (Criterion TWRA PU2)	Potential projects in the TWRA would not result in construction of new water or wastewater treatment facilities. (Impact TWRA-PU-2)	N/A
Construction of New Stormwater Drainage Facilities (Criterion TWRA PU3)	Potential projects in the TWRA would not result in construction of new stormwater drainage. (Impact TWRA-PU-3)	• The applicant shall comply with the goals, policies, and implementation measures of the Kern County General Plan. No mitigation measures would be required
Increased Water Use (Criterion TWRA PU4)	Potential projects would require water for dust control as well as for concrete and drinking water for construction personnel, but this would be a minute fraction of the water supply for the area and would not require any new water treatment facilities nor would it require the acquisition or expansion of water entitlements. (Impact TWRA-PU-4)	• The applicant shall comply with the goals, policies, and implementation measures of the Kern County General Plan. No mitigation measures would be required.
Need for Increased Wastewater Treatment (Criterion TWRA PU5)	Wastewater generation would not exceed wastewater treatment requirements, nor would it require the construction or expansion of wastewater treatment facilities. (Impact TWRA-PU-5)	• The applicant shall comply with the goals, policies, and implementation measures of the Kern County General Plan. No mitigation measures would be required.

Table 6.20-1. Summary of Impacts and Mitigation Measures for the TWRA Study Area

Significance Criteria	Impact Statements	Mitigation Measures
Increase in Solid Waste Disposal (Criterion TWRA PU6)	The amount of waste generated would not exceed any landfill capacities nor would it conflict with any statutes or regulations associated with solid waste. (Impact TWRA-PU-6)	• The applicant shall comply with the goals, policies, and implementation measures of the Kern County General Plan. No mitigation measures would be required.
Conflict with Federal, State, and/or Local Standards Relating to Solid Waste (Criterion TWRA PU7)	Potential projects would not exceed landfill capacities and would implement measures prescribed in the Kern County General Plan. (Impact TWRA-PU-7)	• The applicant shall comply with the goals, policies, and implementation measures of the Kern County General Plan. No mitigation measures would be required.
Traffic and Transportation		
Increases in Vehicle Trips or Volume to Capacity Ratios (Criterion TWRA TRA1)	Future wind development would cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system. (Impact TWRA-TRA-1)	• Schedule construction equipment transport and deliveries to occur during the day (MM TWRA-TRA-1)
Exceedance of Level of Service Standards (Criterion TWRA TRA2)	Future wind development would exceed Level of Service standards established by the Metropolitan Bakersfield General Plan LOS "C". (Impact TWRA-TRA-2)	• Schedule construction equipment transport and deliveries to occur during the day (MM TWRA-TRA-1)
	Future wind development would exceed Level of Service standards established by the Kern County General Plan LOS "D". (Impact TWRA-TRA-3)	• Schedule construction equipment transport and deliveries to occur during the day (MM TWRA-TRA-1)
Change in Air Traffic Patterns (Criterion TWRA TRA3)	Future wind development would cause a change in air traffic patterns that results in substantial safety risks. (Impact TWRA-TRA-4)	• Limit height of turbines to 400 feet above ground level (MM TWRA-HAZ-5) • Comply with requirements to maintain the FAA's Determination of No Hazard to Air Navigation during construction and operation of turbines (MM TWRA-HAZ-6)
Increase Hazards Due to a Design Feature (Criterion TWRA TRA4)	Future wind development would substantially increase hazards caused by a design feature. (Impact TWRA-TRA-5)	• Submit engineering drawings of proposed access road design and obtain encroaching permit for applicable roads (MM TWRA-TRA-2) • Minimize damage to existing roads (MM TWRA-TRA-3)
Inadequate Emergency Access (Criterion TWRA TRA5)	Construction activities could temporarily interfere with emergency response. (Impact TWRA-TRA-6)	• Coordinate with Kern County EMS(MM TWRA-HAZ-8)
Inadequate Parking Capacity (Criterion TWRA TRA6)	Future wind development would result in inadequate parking. (Impact TWRA-TRA-7)	N/A
Conflict with Programs Supporting Alternative Transportation (Criterion TWRA TRA7)	Future wind development would conflict with adopted policies or programs supporting alternative transportation. (Impact TWRA-TRA-8)	N/A
Wilderness and Recreation		
Degradation of Parks or Other Recreational Facilities Due to Increased Use (Criterion TWRA REC1)	No Impacts	N/A

Table 6.20-1. Summary of Impacts and Mitigation Measures for the TWRA Study Area

Significance Criteria	Impact Statements	Mitigation Measures
Adverse Physical Effects from Construction or Expansion or Recreational Facilities (Criterion TWRA REC2)	No Impacts	N/A
Disruption of Activities in a Park or Other Recreational Facility (Criterion TWRA REC3)	Construction activities would temporarily disrupt use of the Pacific Crest National Scenic Trail (Impact TWRA-R-1)	• Maintain required setback from PCT (MM TWRA-R-1)
	Construction activities would temporarily disrupt the use of nearby parks (Impact TWRA-R-2)	N/A
Long-term Loss or Degradation to the Value of a Park or Recreational Facility (Criterion TWRA R4)	Future wind development operation would permanently degrade the quality of the Pacific Crest National Scenic Trail (Impact TWRA-R-3)	• Maintain required setback from PCT (MM TWRA-R-1) • Design project fencing to maintain access to PCT (MM TWRA-R-2)
	Future wind development operation would permanently degrade the quality of nearby parks (Impact TWRA-R-4)	N/A

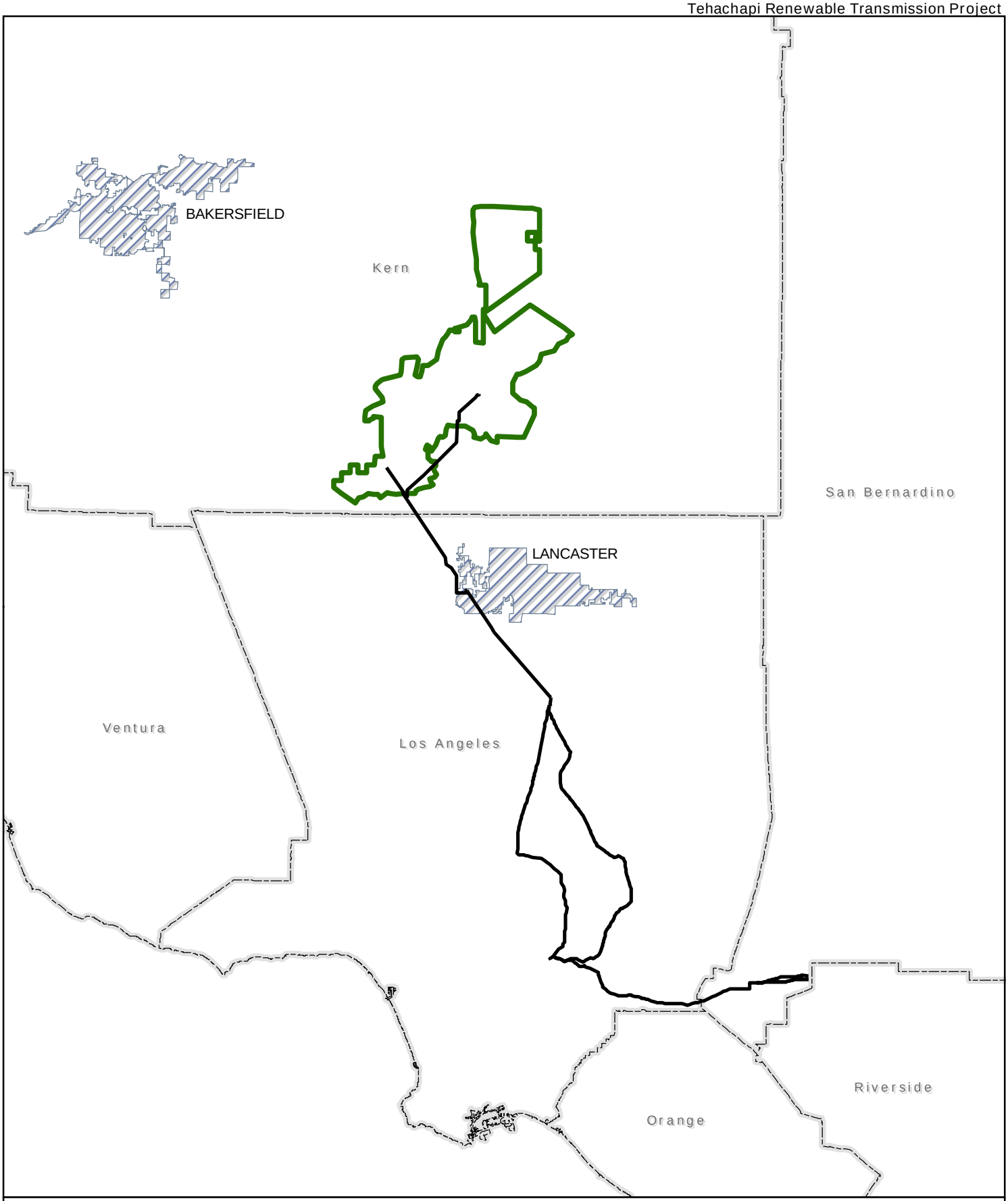


Figure 6.2-1

Regional Map

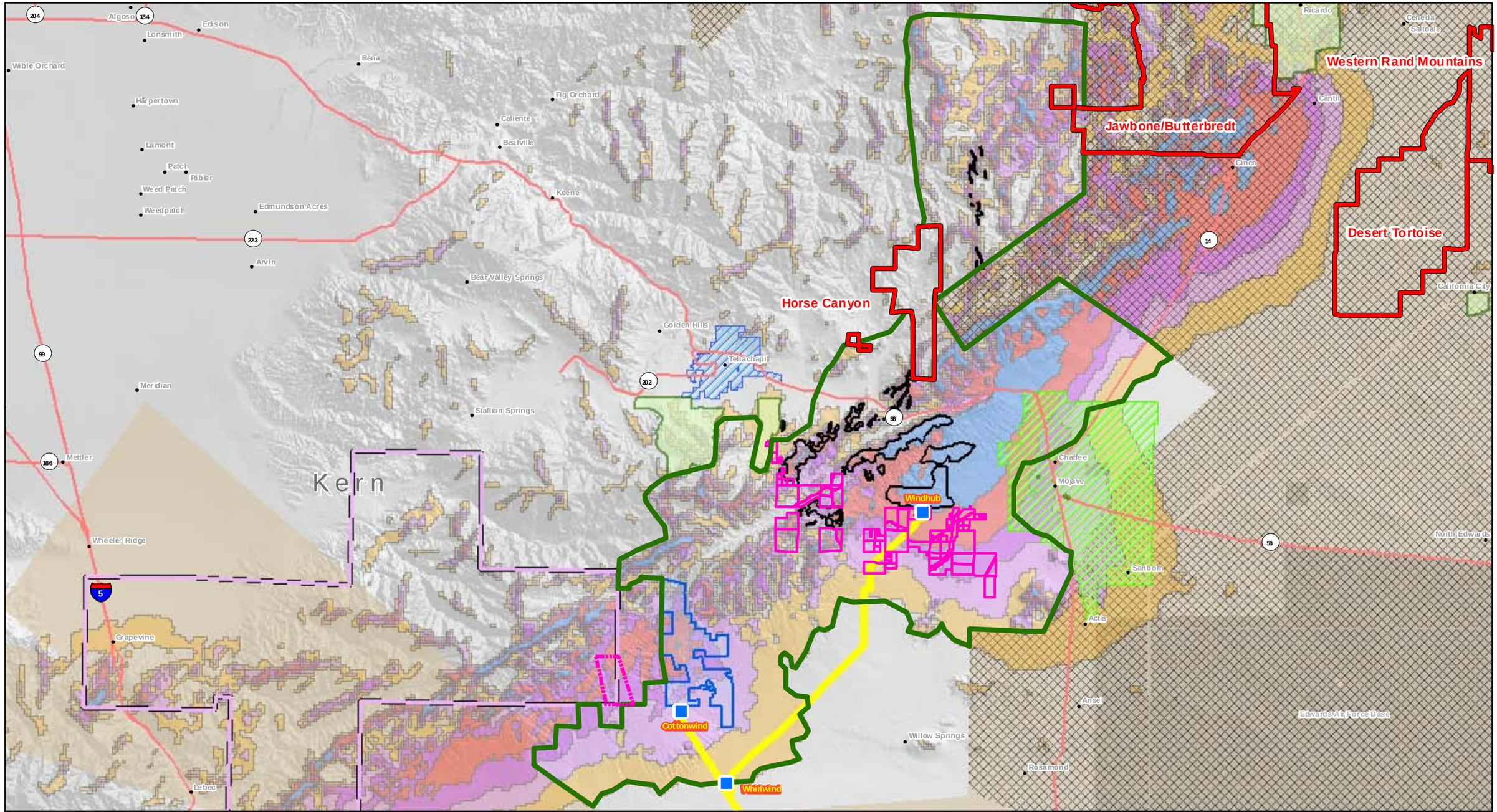


Figure 6.2-2

TWRA Study Area

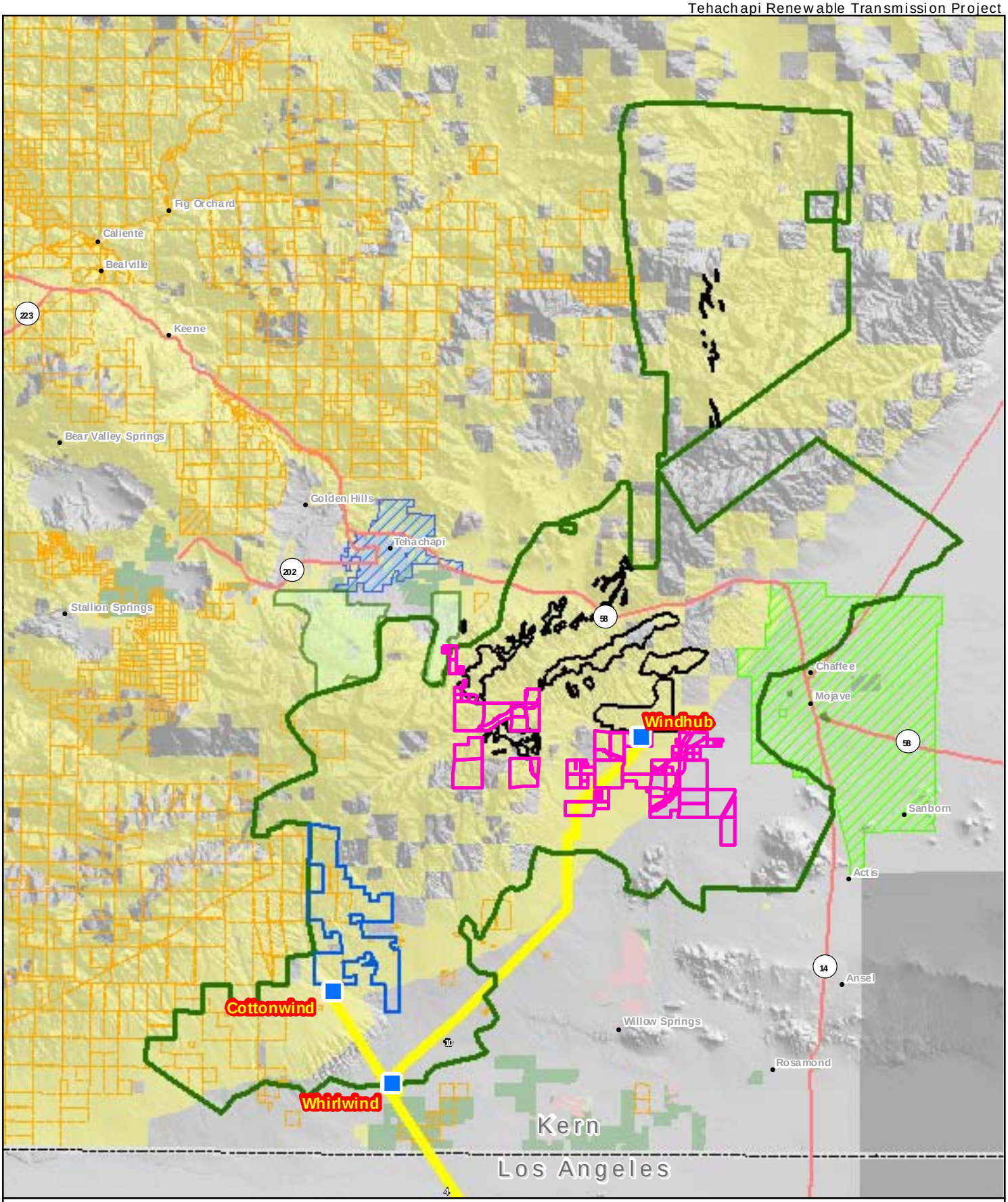


Figure 6.5-1

TWRA Study Area Agriculture

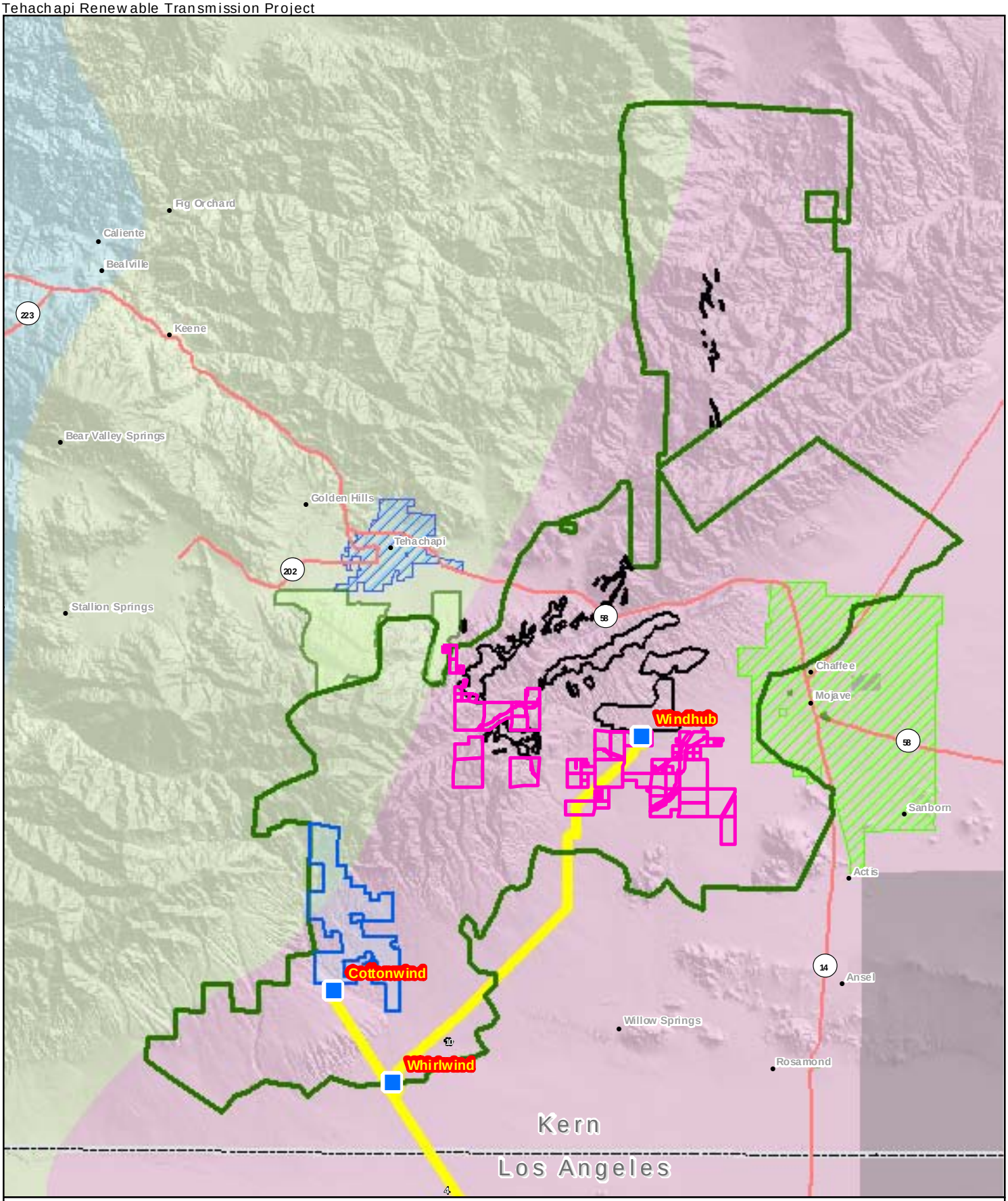


Figure 6.7-1

TWRA Study Area Ecological Regions

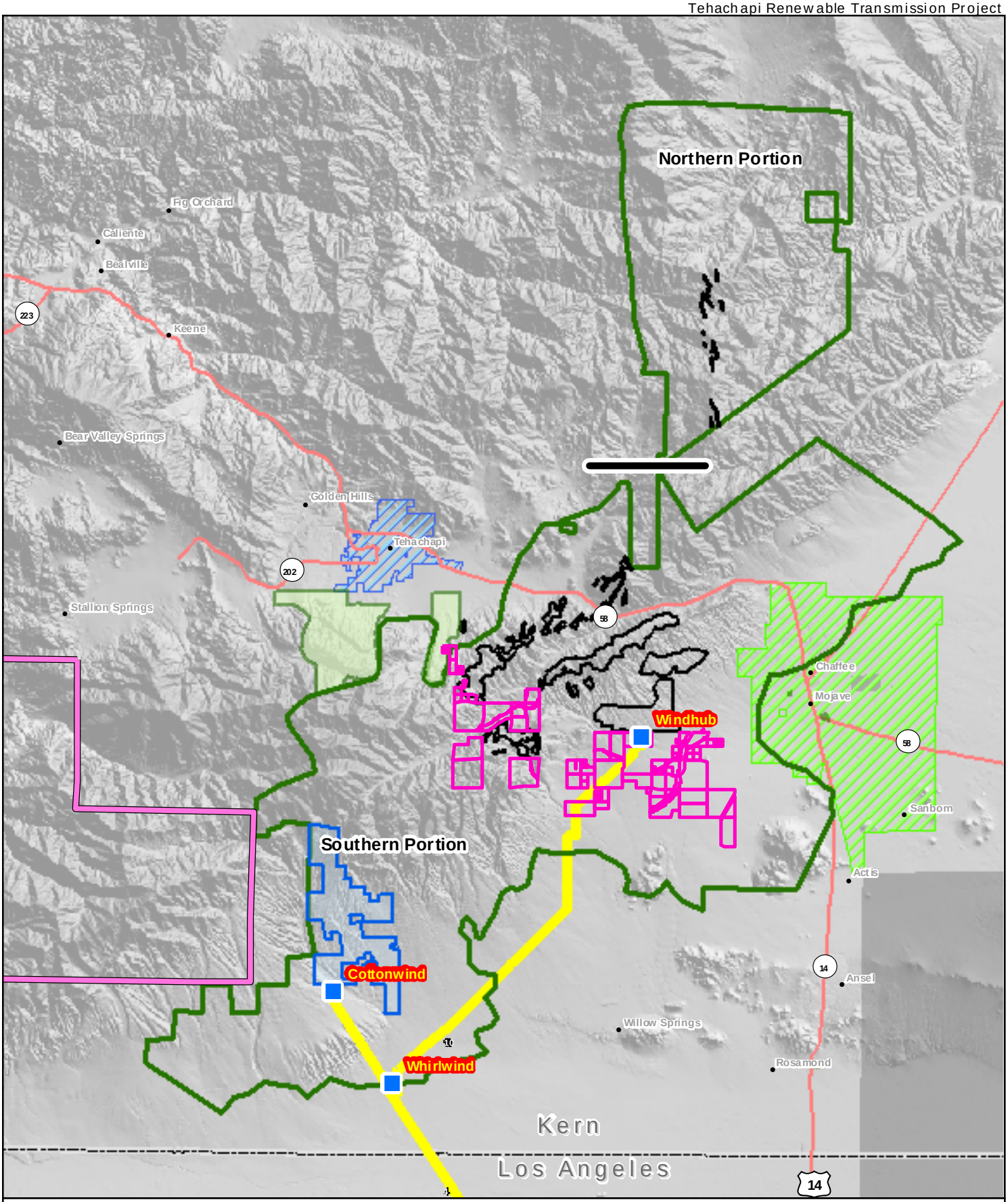


Figure 6.7-2

TWRA Study Area Critical Habitat

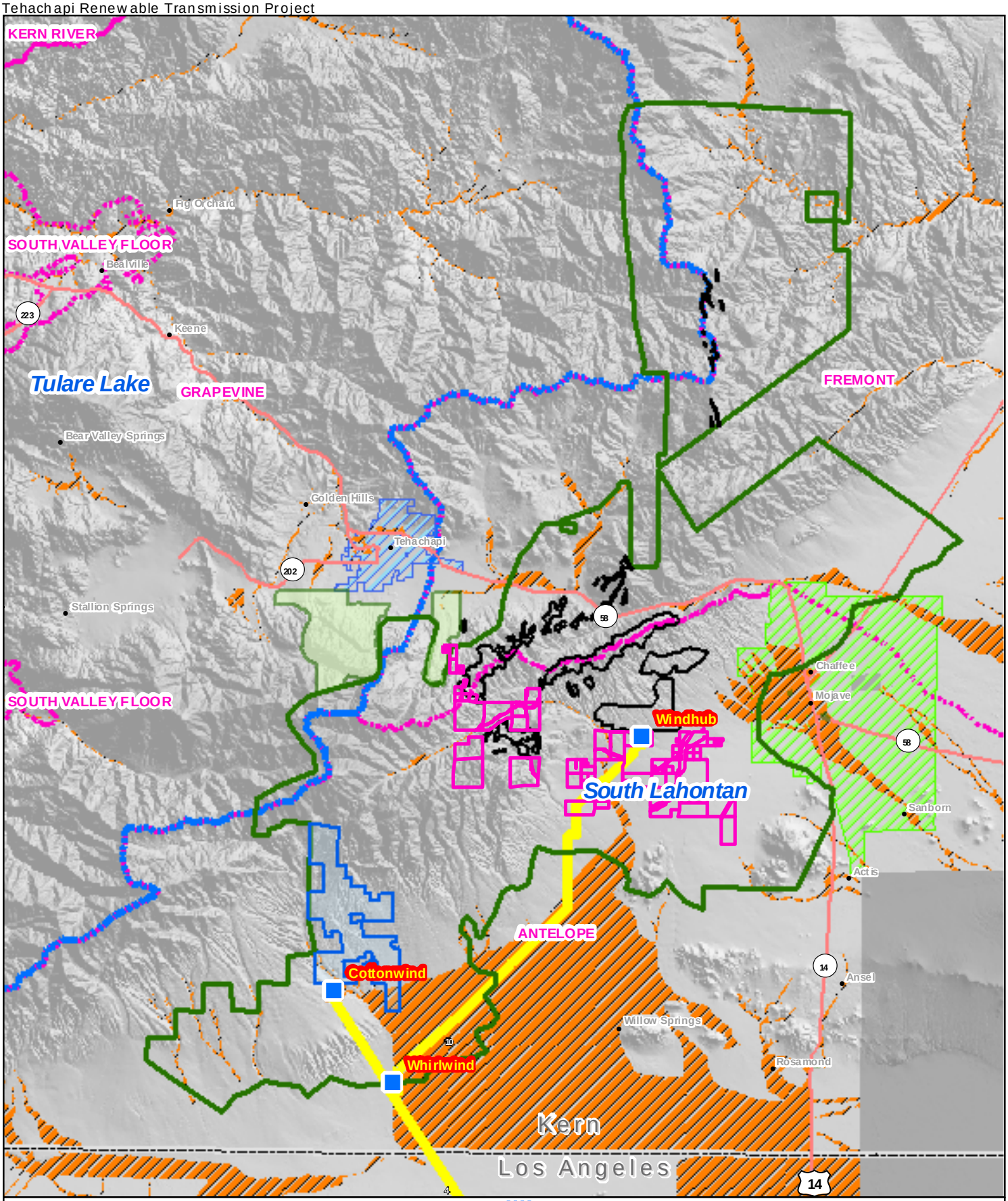


Figure 6.11-1

TWRA Watershed Areas and Flood Hazard Zones

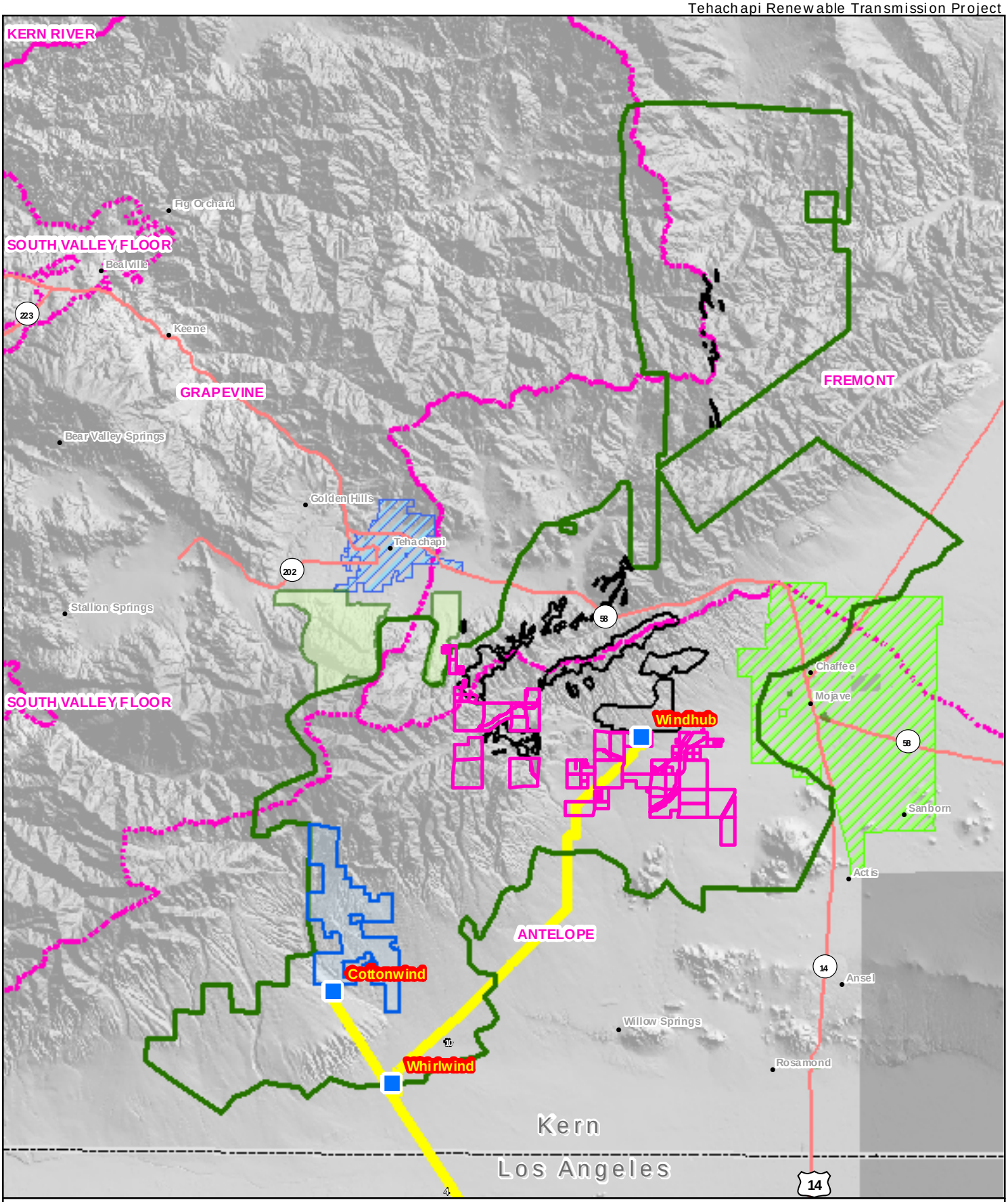


Figure 6.11-2

TWRA Surface Water

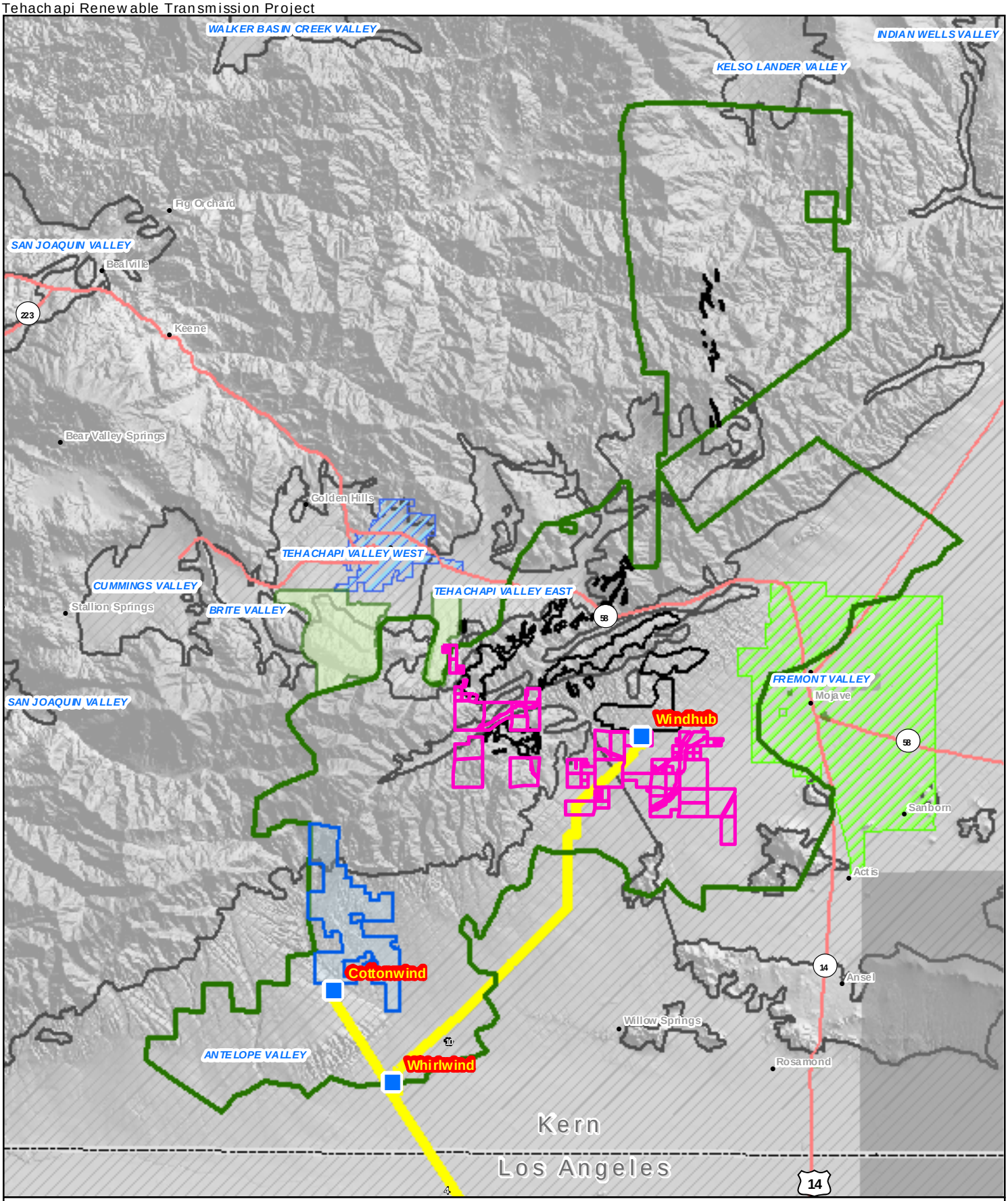


Figure 6.11-3

TWRA Groundwater Basins

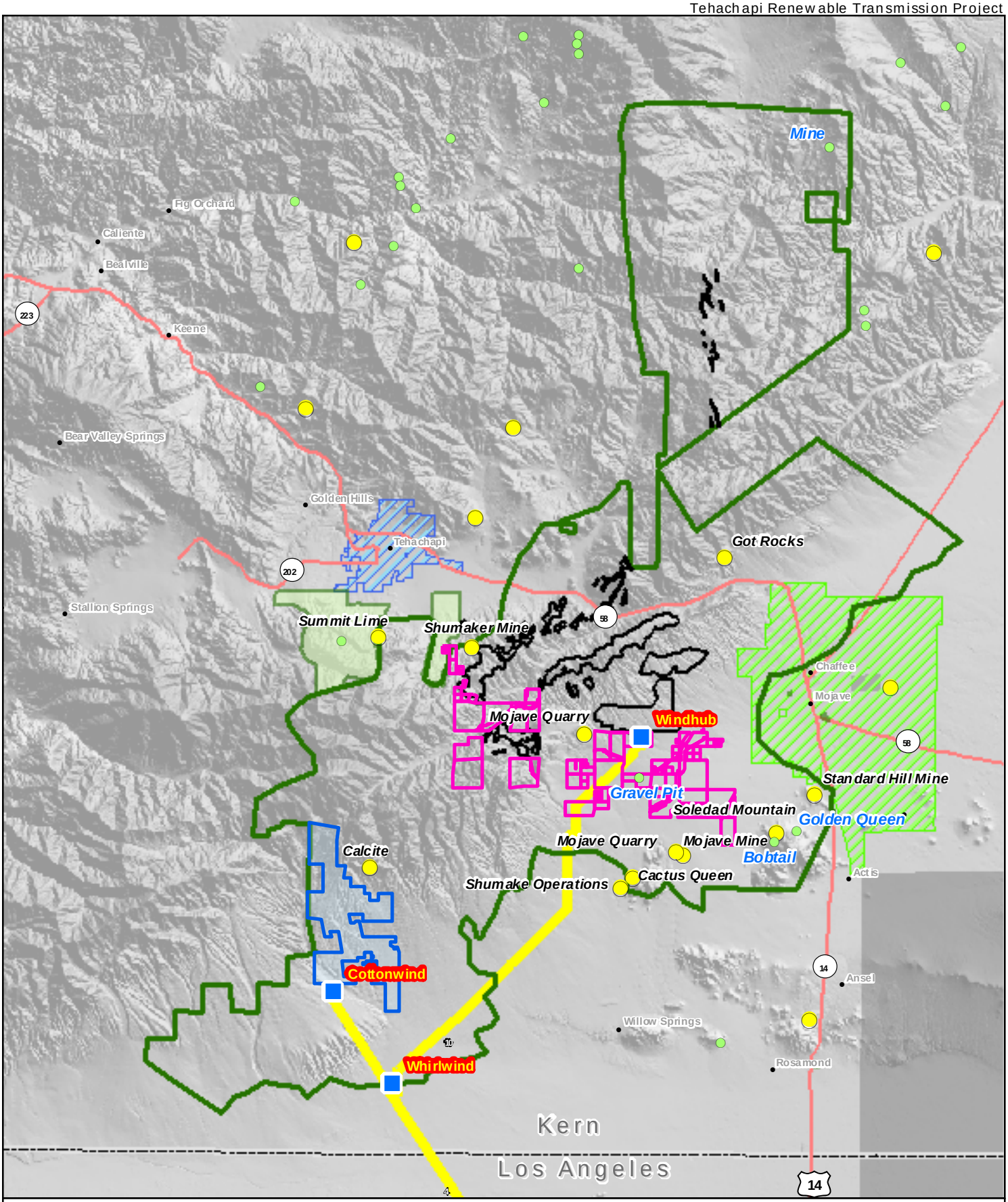


Figure 6.13-1

TWRA Study Area Permitted and Historic Mines

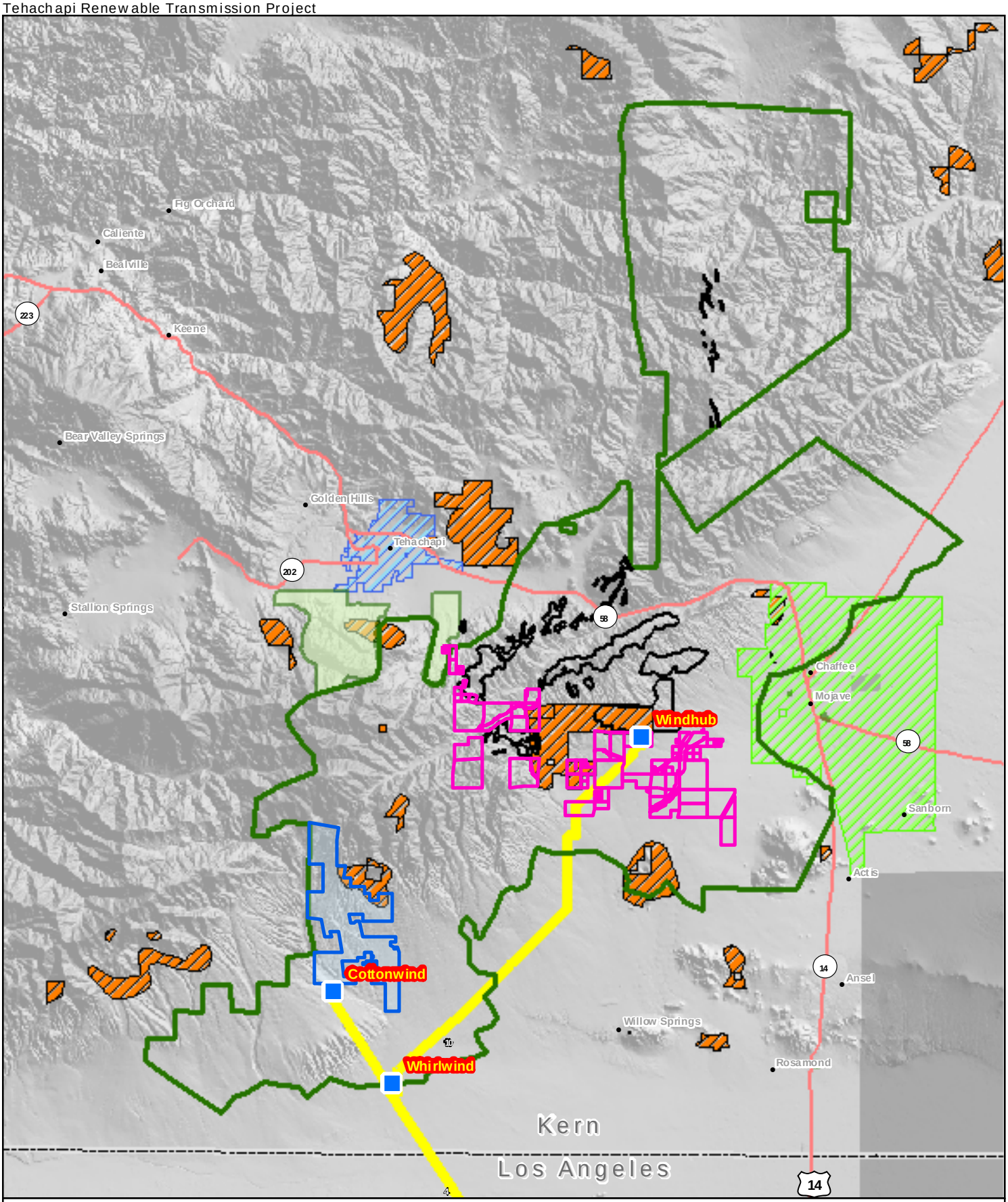


Figure 6.13-2

TWRA Study Area Mineral and Petroleum General Plan Land Use Designation

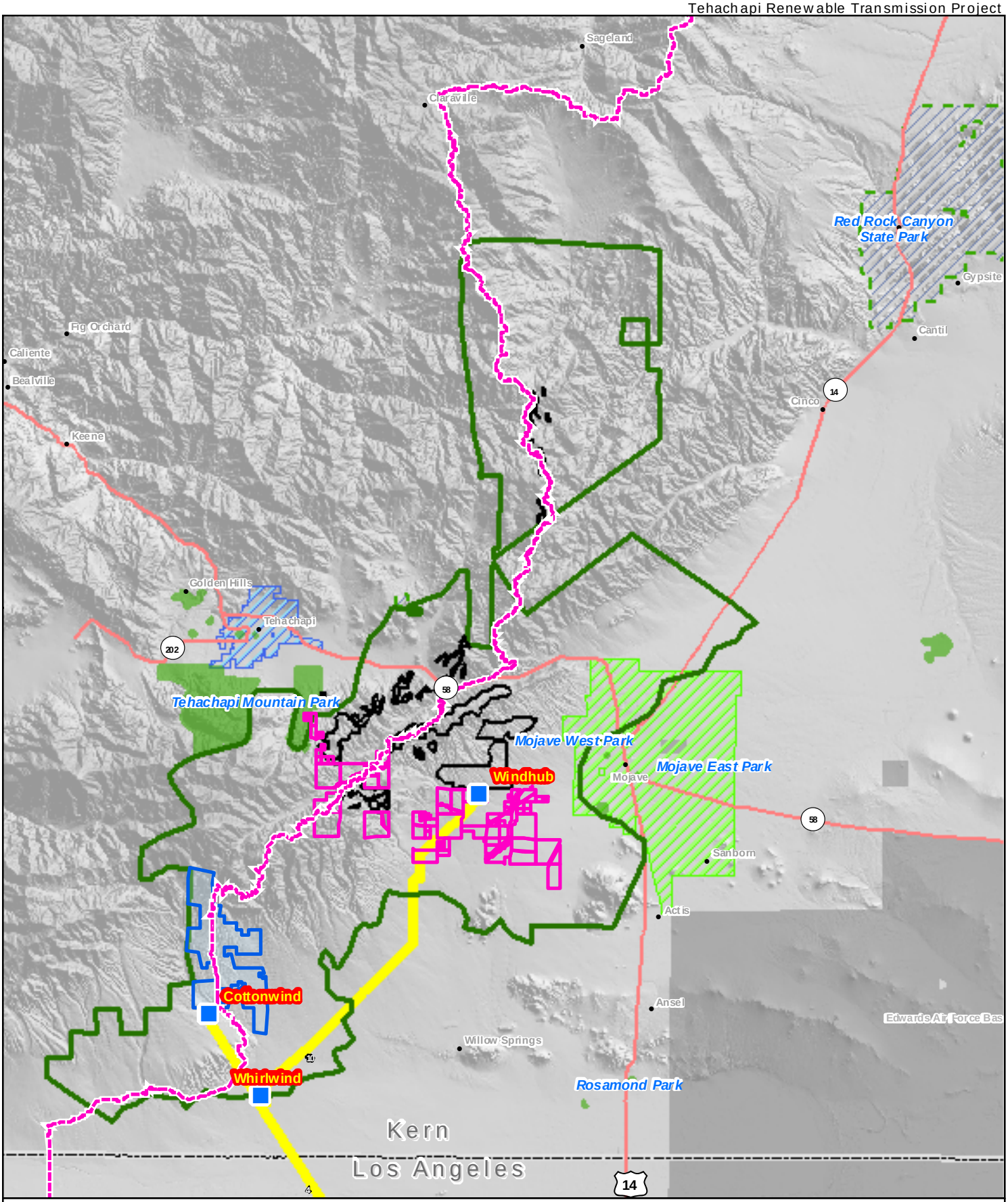


Figure 6.19-1

TWRA Study Area Recreational Resources