project area. The monitoring site was located west of the project boundary near the closest residences (see Figure 4.12-1). A Larson Davis LD831 ANSI Type 1 statistical sound level meter was used to conduct the continuous measurement. The sound level meter was field calibrated before and after the measurement with a Larson Davis CAL200 and was factory calibrated within the previous 12 months. The LD831 meter was set to measure in 10-minute increments, which is the same time interval used for the meteorological measurements. This allowed a direct correlation of noise level with concurrent wind speed. Measurements were conducted from approximately 2:00 p.m. on November 19, 2010 through 9:20 a.m. on November 24, 2010. The measured L8.3 noise levels ranged from as low as approximately 20 dBA with some periods measuring as high as 60 dBA. The lower noise levels of 20-30 dBA generally occurred in the late evening hours and early morning hours with noise levels between 30-50 dBA during the mid-morning to early evening hours. Noise levels between 50-60 dBA occurred over short durations in the mid-morning and afternoon hours (see Appendix J, Figure 5-1).

Wilderness Transmission Line

Due to the minimal distance traversed by the Wilderness transmission reinforcement line, existing corona noise was not modeled.

4.12.3 Regulatory Setting

Federal

There are no federal regulations that apply to noise specifically from commercial WTG operation.

State

There are no State regulations that apply to noise specifically from commercial WTG operation; however, there are general State guidelines provided by the California Department of Health Services that define acceptable noise levels based on a land-use compatibility matrix (OPR, 2003, Appendix C, Figure 2). These guidelines may help to define a threshold for acceptable noise levels for residences in the project area. 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.

Local

Within the State of California, noise from WTG operations is typically regulated at the County level. For Kern County, the applicable documents are the Noise Element of the Kern County General Plan (KCGP), the Ordinance Code of Kern County, and Chapter 19.64, Wind Energy (WE) Combining District, of the Kern County Zoning Ordinance.
Figure 4.12-1
Sensitive Receptor Locations Near the Proposed Project Site

Source: CH2MILL, 2011.
Figure 4.12-2
Sensitive Receptor Locations Near the Proposed Regional Transmission Reinforcements

Source: CH2MHILL, 2011.
KCGP

The KCGP Noise Element identifies goals, policies, and implementation measures that are used to guide development with regard to noise. The KCGP Noise Element identifies residential areas, schools, convalescence and acute care hospitals, parks and recreational areas, and churches as noise sensitive land uses. In noise sensitive areas, exterior noise levels generated by new projects are 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 or other noise sensitive interior spaces. The following General Plan goals, policies, and implementation measures are applicable to the proposed project:

Chapter 3. 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.

Implementation Measures

- **Implementation Measure A.** Utilize zoning regulations to assist in achieving noise-compatible land use patterns.
- **Implementation Measure C.** Review discretionary development plans, programs and proposals, including those initiated by both the public and private sectors, to ascertain and ensure their conformance to the policies outlined in this element.
- **Implementation Measure F.** Require proposed commercial and industrial uses or operations to be designed or arranged so that they will not subject residential or other noise sensitive land uses to exterior noise levels in excess of 65 dB L_{dn} and interior noise levels in excess of 45 dB L_{dn}.
- **Implementation Measure G.** At the time of any discretionary approval, such as a request for a General Plan Amendment, zone change or subdivision, the developer may be required to submit an acoustical report indicating the means by which the developer proposes to comply with the noise standards. The acoustical report shall:
(a) Be the responsibility of the applicant.
(b) Be prepared by a qualified acoustical consultant experienced in the fields of environmental noise assessment and architectural acoustics.
(c) Be subject to the review and approval of the Kern County Planning Department and the Environmental Health Services Department. All recommendations therein shall be complied with prior to final approval of the project.

- **Implementation Measure H.** Encourage cooperation between the County and the incorporated cities within the County to control noise.
- **Implementation Measure I.** Noise analyses shall include recommended mitigation, if required, and shall:
  (a) Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions.
  (b) Include estimated noise levels, in terms of CNEL, for existing and projected future (10 – 20 years hence) conditions, with a comparison made to the adopted policies of the Noise Element.
  (c) Include recommendations for appropriate mitigation to achieve compliance with the adopted policies and standards of the Noise Element.
  (d) Include estimates of noise exposure after the prescribed mitigation measures have been implemented. If compliance with the adopted standards and policies of the Noise Element will not be achieved, a rationale for acceptance of the project must be provided.
- **Implementation Measure J.** Develop implementation procedures to ensure that requirements imposed pursuant to the findings of an acoustical analysis are conducted as part of the project permitting process.

**Kern County Health and Safety Ordinance (Title 8 of the Ordinance Code)**

Chapter 8.36, Noise Control (Section 8.36.020, Prohibited Sounds) of the Ordinance Code of Kern County prohibits construction noise between the hours of 9:00 p.m. and 6:00 a.m. on weekdays and 9:00 p.m. and 8:00 a.m. on weekends, which is audible to a person with average hearing faculties or capacity at a distance of 150 feet from the construction site, if the construction site is within 1,000 feet of an occupied residential dwelling except for emergency work or when the resource management director or his designated representative provides an exemption for a limited time.

**Kern County Zoning Ordinance (Title 19 of the Ordinance Code)**

Chapter 19.64. WE Combining District.

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 WTGs. The following provisions apply to noise issues related to the proposed project.

**Section 19.64.140(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 (½) 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 using the L8 metric 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.

<table>
<thead>
<tr>
<th>One-third Octave Band Center Frequency (Hz)</th>
<th>Sound Pressure Level (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 to 1</td>
<td>70 (each band)</td>
</tr>
<tr>
<td>20</td>
<td>68</td>
</tr>
<tr>
<td>25</td>
<td>67</td>
</tr>
<tr>
<td>31.5</td>
<td>65</td>
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<tr>
<td>100</td>
<td>52</td>
</tr>
<tr>
<td>125</td>
<td>50</td>
</tr>
</tbody>
</table>

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). 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) miles per hour (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.

Vibration

Kern County does not include thresholds of significance for vibration levels. Per the Federal Transit Administration, engineered concrete and masonry buildings (no plaster) susceptible to vibration damage begin to experience structural damage at vibration levels of 0.3 inch per second Peak Particle Velocity (PPV) (FTA, 2006 – Table 12-3).

4.12.4 Impacts and Mitigation Measures

Methodology

CEQA requires determination of the significance of noise impacts associated with proposed projects. The process of assessing the significance of noise impacts associated with the project involves establishing thresholds at which significant impacts on noise-sensitive uses may occur. Noise levels associated with construction and operational activities related to the project, which includes both the North Sky River Wind Energy Project and Jawbone Wind Energy Project, were predicted and compared to these significance thresholds.

Construction noise levels to be generated by the proposed project would be typical of comparable large construction project. Noise levels would vary during the construction period depending on the construction phase and types of equipment in use. Construction noise levels were estimated based on the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM) estimates of noise levels for the operation of heavy equipment. The anticipated construction noise at the closest sensitive receptor was calculated based on the distance of the sensitive receptor from the potential construction areas. Predicted levels are conservative because the only attenuating mechanism considered was divergence of the sound waves in open air, which equates to a 6 dB reduction per doubling of distance. This noise level at the closest sensitive receptor was then compared to the significance threshold.

The operational noise level for the WTGs was calculated using the computer software noise model, CADNA/A® by DataKustick GmbH of Munich, Germany, with sound propagation factors adopted from ISO 9613-2 Acoustics – Sound Attenuation During Propagation Outdoors and VDI 2714.