DOCKETED

Docket Number:	15-AFC-01
Project Title:	Puente Power Project
TN #:	204219-14
Document Title:	4.7 Noise and Vibration
Description:	N/A
Filer:	Sabrina Savala
Organization:	NRG Oxnard Energy Center, LLC
Submitter Role:	Applicant
Submission Date:	4/16/2015 10:44:09 AM
Docketed Date:	4/15/2015

4.7 NOISE AND VIBRATION

This section describes the existing outdoor ambient sound environment in the vicinity of the Mandalay Generating Station (MGS) on which the proposed Puente Power Project (P3 or project) is planned to be sited. It also evaluates the future outdoor ambient sound environment and assesses potential noise impacts due to contribution of noise from the construction and operation of P3.

The sections below provide an overview of the affected environment, which begins with an introduction to acoustical terminology and concepts to help frame this technical analysis; an evaluation of the environmental consequences of the proposed project pertaining to noise and vibration; a cumulative impact analysis; and presentation of appropriate mitigation measure options, which if properly implemented, will avoid and reduce project impacts to less-than-significant levels. Potential impacts are assessed at identified nearest noise-sensitive receptors with respect to applicable laws, ordinances, regulations, and standards (LORS) that serve as thresholds for noise and vibration produced during project construction and operation.

For purposes of analysis in this chapter, the project area refers to all areas of temporary and permanent disturbance associated with the construction and operation of the new plant and ancillary systems, and construction laydown areas. No new offsite linear facilities are required for the project. The noise and vibration study area evaluated in this chapter is defined as the area within a 1-mile radius of the P3 site.

4.7.1 Affected Environment

4.7.1.1 Fundamentals of Acoustics

4.7.1.1.1 Underlying Concepts and Term Definitions

Noise

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity and interferes with or disrupts normal activities. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to typical environmental noise exposure levels is annoyance. The response of individuals to similar noise events is diverse and influenced by many factors, including the type of noise, the perceived importance of the noise and its appropriateness in the setting, the time of day and the type of activity during which the noise occurs, and the sensitivity of the individual.

Sound

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air, and are sensed by the human ear. Sound is generally characterized by several variables, including frequency and amplitude. Frequency describes the sound's pitch and is measured in cycles per second (Hertz), while amplitude describes the sound's pressure (loudness). Because the range of sound pressures that occur in the environment is so large, it is convenient to express these pressures on a logarithmic scale that compresses the wide range of pressures into a more useful range of numbers. The standard unit of sound pressure measurement is the decibel (dB).

Hertz (Hz) is a measure of how many times each second the crest of a sound pressure wave passes a fixed point. For example, when a drummer beats a drum, the skin of the drum vibrates a number of times per second. When the drum skin vibrates 100 times per second it generates a sound pressure wave that is oscillating at 100 Hz, and this pressure oscillation is perceived by the ear/brain as a tonal pitch of 100 Hz. Sound frequencies between 20 and 20,000 Hz are within the range of sensitivity of the average healthy human ear.

Sound level is expressed by reference to a specified national/international standard. This section refers to two acoustical quantities: (1) Sound Power Level (PWL or L_w) is used to express the sound energy radiated from a source; and (2) Sound Pressure Level (SPL) is used to describe sound at a specified distance or specific receptor location. In expressing sound power as a dB level, the standard reference sound power is 1 picowatt. In expressing SPL on a logarithmic scale, sound pressure is compared to a reference value of 20 micropascals. These terms are different and should not be confused. PWL is a measure of the inherent acoustic power radiated by a source, while SPL depends not only on the power of the source, but also on the distance from the source and on the acoustical characteristics of the space surrounding the source (absorption, reflection, etc.). This is analogous to lighting, where the bulb wattage is its power and does not vary with location or environmental conditions, but the bulb's apparent brightness varies with the viewer's distance to the bulb and the surroundings.

Sound Propagation

Outdoor sound levels decrease as the distance from the source increases. This is due to wave divergence, atmospheric absorption, and ground attenuation. Sound radiating from a source in a homogeneous and undisturbed manner travels in spherical waves. As the sound waves travel away from the source, the sound energy is dispersed over a greater area, decreasing the sound pressure of the wave. Spherical spreading of the sound wave reduces the noise level at a rate of 6 dB per doubling of distance from a point source.

Atmospheric absorption also influences the sound levels received by an observer and becomes important at distances greater than 1,000 feet. The degree of absorption varies depending on the frequency of the sound, as well as the humidity and temperature of the air. For example, atmospheric absorption is lowest (i.e., sound carries farther) at high humidity and high temperatures; and higher frequencies are more readily absorbed than lower frequencies. The result is that over large distances, lower-frequency sound can become dominant as higher-frequency sound is more rapidly attenuated. Turbulence, gradients of wind, and other atmospheric phenomena also play a significant role in determining the degree of attenuation. For example, certain meteorological conditions such as temperature inversions can refract sound waves towards receivers on the ground (i.e., rather than upwards into the atmosphere), resulting in higher noise levels than would result from simple spherical spreading.

A-Weighting

Sound from a tuning fork contains a single frequency (a pure tone), but most sounds one hears in the environment do not consist of a single frequency, but rather a broad band of many frequencies differing in sound level. Because of the broad range of audible frequencies, methods have been developed to quantify these values into a single number. The most common method used to quantify environmental sounds consists of evaluating all frequencies of a sound according to a weighting system that is reflective of human hearing. Human hearing is less sensitive at low frequencies and extremely high frequencies than at the mid-range frequencies. This process is termed "A" weighting, and the resulting dB level is termed the "A-weighted" decibel (dBA). "A" weighting is widely used in local noise ordinances and state and federal guidelines. In practice, the level of a noise source is conveniently measured using a sound-level meter (SLM) that includes a filter corresponding to the dBA curve. Unless specifically noted, the use of "A" weighting is always assumed with respect to environmental sound and community noise, even if the notation does not show the "A."

Perception of Sound

A sound level of 0 dBA is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. This threshold is the reference level against which the amplitude of other sounds is compared. Normal speech has a sound level of approximately 60 dBA. Sound levels above about 120 dBA begin to be felt inside the human ear as discomfort—and eventually pain—at still

higher levels. The minimum change in the sound level of individual events that an average human ear can detect is about 1 to 2 dB. A 3- to 5-dB change is readily perceived. An increase or decrease in sound level of about 10 dB is usually perceived by the average person as a doubling (or halving) of the sound's loudness.

Combining Sound Levels

Because of the logarithmic nature of the dB unit, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically. However, some simple rules are useful in dealing with sound levels. First, if a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, for example: 60 dB + 60 dB = 63 dB, and 80 dB + 80 dB = 83 dB. Remember, however, that it requires about a 10-dB increase to double the perceived intensity of a sound.

Common Noise Metrics

Although dBA may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most ambient environmental noise includes a mixture of noise from nearby and distant sources that creates an ebb and flow of sound, including some identifiable sources plus a relatively steady background noise in which no particular source is identifiable. A single descriptor called the equivalent sound level (L_{eq}) is used to describe sound that is constant or changing in level. L_{eq} is the energy-mean dBA during a measured time interval. It is the "equivalent" constant sound level that would have to be produced by a given constant source to equal the acoustic energy contained in the fluctuating sound level measured during the interval. In addition to the energy-average level, it is often desirable to know the acoustic range of the noise source being measured. This is accomplished through the maximum (L_{max}) and minimum (L_{min}) indicators that represent the root-mean-square maximum and minimum noise levels measured during the monitoring interval. The L_{min} value obtained for a particular monitoring location is often called the acoustic floor for that location.

Common Noise Statistics

To describe the time-varying character of environmental noise, the statistical or percentile noise descriptors L_{10}, L_{50}, and L_{90} may be used. These are the noise levels equaled or exceeded during 10 percent, 50 percent, and 90 percent of the measured time interval. Sound levels associated with L_{10} typically describe transient or short-term events; half of the sounds during the measurement interval are softer than L_{50} and half are louder; while levels associated with L_{90} are typically used to describe the background noise conditions.

Common Day-Night Noise Descriptors

The Day-Night Average Sound Level (L_{dn} or DNL) represents the average sound level for a 24-hour day and is calculated by adding a 10-dB penalty only to sound levels during the nighttime period (10:00 p.m. to 7:00 a.m.). The L_{dn} is the descriptor of choice used by nearly all federal, state, and local agencies throughout the United States to define acceptable land use compatibility with respect to noise. Because of the time-of-day penalties associated with the L_{dn} descriptor, the L_{dn} dBA value for a continuously operating sound source during a 24-hour period will be numerically greater than the dBA value of the 24-hour L_{eq}. Therefore, for a continuously operating noise source producing a constant noise level operating for periods of 24 hours or more, the L_{dn} will be approximately 6 dB higher than the L_{eq} value.

The Community Noise Equivalent Level (CNEL) is another frequently used day-night sound level descriptor that is similar to L_{dn}, but its derivation classifies the 7 p.m. to 10 p.m. portion of daytime hours as "evening," and adds a 5 dBA increment to each. Therefore, a CNEL value can be slightly higher than that of an L_{dn} that has been derived from the same set of hourly L_{eq}.

4.7.1.1.2 Near-Field Versus Far-Field Noise Emission Specifications

The two most common reasons for quantifying sound levels are to evaluate occupational noise exposure and community noise exposure. In the case of the former, the most important parameters are the measured level of sound at the employee's ears during typical work tasks; the cumulative amount of sound energy to which a worker is exposed during a work shift; and the type of noise (i.e., is it relatively constant or "impulsive" in character). In such occupational settings, the term "near" or "near field" describes an assumption that the worker's ears are approximately 3 feet (1 meter) distant from the noise source. An SPL measurement location this close (i.e., 1 meter) to a large, noisy machine would also be considered in the acoustic near field, so machine specifications that include prescription for SPL not to exceed "85 dBA at 3 feet" is helpful for assessing occupational noise exposure.

With respect to community noise, however, where it assumed that receivers are much more distant from a noise source, much more acoustic information is needed to accurately predict exposure level and assess environmental effects. In other words, a noise-producing machine may indeed generate only 85 dBA at a distance of 3 feet, but that quantity alone does not provide sufficient information to estimate noise in the "far field" at a more distant receiver location.

Therefore, for the purposes of this analysis, (L_w at octave band center frequency (OBCF) resolution of each major noise-producing source were sought for the predictive model of project operational noise. Unlike SPL at a reference distance, L_w is a reference sound level that does not depend on distance, directivity, or environmental conditions. The OBCF detail, when available, allows a prediction model to more accurately account for frequency-dependent sound propagation effects such as acoustical absorption from the air and ground, temperature, humidity, and intervening terrain in its estimate of resultant SPL at receiver locations of interest.

4.7.1.2 P3 Project Site and Vicinity

Figure 2.3-1 shows the P3 site in relation to the surrounding area, as well as nearby roads and other area features. P3 will be sited in the northern portion of the existing 36-acre MGS property at 393 North Harbor Boulevard in Oxnard, Ventura County, California.

The site is bordered by sand dunes and the Pacific Ocean to the west; McGrath Lake State Park and land owned by SunCal to the north; industrial uses to the north, south, and east; and agricultural uses farther to the east. The closest existing residential neighborhood is the Oxnard Shores Mobile Home Park (Oxnard Shores), approximately 0.75 mile (or approximately 3,900 feet) south from the proposed P3 stack, south of West 5th Street and west of Harbor Boulevard. The North Shore at Mandalay Bay is a proposed residential development scheduled to commence construction in 2016. The distance from the proposed P3 stack to the closest North Shore at Mandalay Bay development boundary is approximately 0.47 mile, or approximately 2,460 feet.

4.7.1.3 Existing Outdoor Ambient Sound Environment

During a field survey from December 15 through 18, 2014, AECOM measured short-term (ST) SPL at a variety of MGS onsite locations during known operational periods for existing MGS power-generating Units 1, 2, and 3, and three offsite long-term (LT) monitoring positions (LT-1, LT-2, LT-3) representing nearest residential noise-sensitive receivers (NSR) with respect to the P3 project area. SPL data concurrently collected at two of these three generally unattended LT positions appear to be representative of environmental conditions during the multiple-day survey, and include periods when precipitation did and did not occur, as well as when existing MGS Units 1, 2, and 3 were and were not operating under load. Attended SPL measurements were conducted at the three LT positions for ST periods at various times of day to collect SPL data during witnessed environmental conditions.

Additionally, concurrent SPL measurements were performed at multiple positions at and near the beach adjoining the northwestern corner of Oxnard Shores (the residential community represented by LT-1) to help evaluate the acoustical influence of ocean surf on the ambient outdoor sound level.

The following paragraphs describe the methodology used to measure and document these outdoor sound levels, and why these levels are a representative baseline characterization of the pre-project ambient sound environment prior to predictive project noise analysis and impact assessment.

4.7.1.3.1 Field Survey Methodology

Measurement Locations

The selected LT monitoring and ST measurement locations shown on Figure 4.7-1, coinciding with three representative nearest noise-sensitive receivers with respect to the project site, were chosen by AECOM investigators in the field after a preliminary review of online aerial imagery and other literature. Photographs of the measurement positions appear in Appendix H-1.

Protocol Summary

After conducting an initial reconnaissance of the project surroundings, the AECOM field investigators set up each of the three LT noise monitors and performed pre-measurement instrument calibration checks prior to the start of monitoring. Secured to existing fixed manmade or natural features, these LT monitors were left unattended until revisited by investigators to check instrument function, remaining on-board memory, and battery life. Such visits occurred a few times per 24-hour period, at which times ST measurements were also conducted in proximity to the concurrently operating LT monitors.

Offsite ST measurements were generally conducted concurrently at each of the LT monitoring positions, with an investigator attending the sound-level meter and making simultaneous observations of perceived sound sources and environmental conditions.

ST measurements of ocean surf noise were conducted concurrently at the two indicated positions on Figure 4.7-1. The SLMs used during the first of two measurement periods were then swapped between these two locations, and the measurement was repeated for the second period.

All sound measurements were conducted with wind-screened microphones. ST measurements were performed with the SLM mounted atop a camera tripod, so that the microphone was approximately 5 feet above grade. The calibration status of SLMs used for ST measurements was checked in the field before and after each measurement. Each ST and LT SLM was set to record L_{eq}, L_{max}, L_{min}, and L_{10}, L_{50}, and L_{90} for each measurement period.

Instrumentation

The attended ST measurements were made with the following SLMs:

- Larson Davis Model 820 SLM (Serial Numbers [SN] 1651, 1652), American National Standards Institute (ANSI) S1.4-1983 Type 1
- Brüel & Kjær Model 2250 SLM (SN 2653963), ANSI S1.4-1983 Type 1
- Larson Davis Model LxT SLM (SN 2527), ANSI S1.4-1983 Type 1
- Larson Davis Model 824 SLM (SN 0427), ANSI S1.4-1983 Type 1

The unattended LT monitors comprised the following set of instruments, in order of location:

- LT-1 – Larson Davis Model 712 SLM (SN 0418), ANSI S1.4-1983 Type 2

- LT-2 – Larson Davis Model 720 SLM (SN 0436), ANSI S1.4-1983 Type 2
- LT-3 – Larson Davis Model 820 SLM (SN 1736), ANSI S1.4-1983 Type 1

To help ensure measurement accuracy and to verify laboratory calibration, the instruments were checked in the field before and after each measurement period with a Larson Davis Model CAL200 acoustic calibrator (SN 5789).

4.7.1.3.2 Field Survey Results

Atmospheric conditions were suitable for conducting noise measurements for most of the multi-day survey period with only a few limited occurrences of precipitation, as indicated below from meteorological data collected at Oxnard Municipal Airport (Weather Underground, 2014):

- December 15, 2014 – light rain from 7:51 p.m. to 9:51 p.m.
- December 16, 2014 – light rain from 12:14 a.m. to 1 a.m., 3:27 a.m. to 5 a.m., and 3:46 p.m. to 3:51 p.m.
- December 17, 2014 – light rain from 12:51 a.m. to 2:16 a.m.
- December 18, 2014 – light rain from 8:51 a.m. to 9:51 a.m.

During these periods of light rain, measurements of ambient outdoor sound would include the effects of increased road traffic noise due to tire contact on wet pavement, and the sounds of precipitation falling on surfaces near the measurement instrumentation. For these reasons, SPL measurement data collected during such conditions would not be considered representative.

Mean temperatures ranged from 56 to 57 degrees Fahrenheit (°F), with average relative humidity ranging from 67 to 82 percent.

ST noise metrics and statistics from collected measurement data appear in Table 4.7-1; and LT noise data, summarized as hourly metrics, and statistics at two of the LT monitoring locations are provided in Tables 4.7-2 and 4.7-3.

4.7.1.3.3 Field Survey Discussion

LT-1 (Oxnard Shores)

As shown in the photographs in Appendix H-1, LT-1 is an LT noise-monitoring location that represents the Oxnard Shores Mobile Home Park at 5540 West 5th Street in Oxnard. The LT monitor was set up on the northern side of West 5th Street, at its intersection with Oxnard Shores Drive. From this publicly accessible location, the MGS site is clearly visible to the north over the expanse of Mandalay County Park. Perceived noise sources contributing to the ambient sound environment included passing road traffic, the ocean surf, aircraft overflights, and sound from facilities to the north—either MGS or neighboring oil-and-gas industrial facilities (e.g., DCOR).

The average hourly L_{90} for the four consecutive quietest hours measured during the survey (December 16, 2014, 00:25 a.m. to 04:25 a.m.) is 43.4 dBA. No precipitation occurred during this 4-hour time period, and none of the MGS systems (Units 1, 2, or 3) were known to be operating (aside from minimally operating systems, such as circulation water pumps).

Table 4.7-4 presents selected hourly SPL data from Tables 4.7-2 and 4.7-3, showing what outdoor ambient sound levels were measured at LT-1 when MGS Units 1 and 2 were both operating under load and at their highest output during the indicated days. Similarly, measured SPL at LT-1 is indicated during the period when MGS Unit 3 was operating at its peak (but without MGS Unit 1 or Unit 2 operating). As

discussed in Section 4.7.2, these ambient sound levels represent one of the baseline condition scenarios (i.e., existing ambient) against which predicted project noise is compared to assess impacts.

LT-2 (Gonzales Road)

LT-2 is a noise-monitoring location representing the residential receiver at 5718 West Gonzales Road in unincorporated Ventura County. The LT monitor was set up on a nearby dune, and unattended SPL measurements were conducted for a time at this position; which, as shown in Appendix H-1, has a clear view of the MGS site. Data collected from the instrument suggest it experienced atypical operation; therefore, data from this monitor were considered invalid for purposes of potentially being used for this noise impact assessment. However, measurement data from the attended ST measurements that were performed with different SLMs are considered valid, with results shown in Table 4.7-1. Perceived noise sources contributing to the ambient sound environment included passing road traffic, aircraft overflights, sounds from an apparent warehousing facility to the north, and either MGS or neighboring oil-and-gas industrial facilities to the south. Table 4.7-1 indicates that L_{90} was as low as 40 to 41 dBA during the partial-hour periods it was measured at this location.

LT-3 (North Shore at Mandalay Bay)

LT-3 is a noise-monitoring location representing the northwestern corner of a future residential development called North Shore at Mandalay Bay. The LT monitor was installed as far as practical from the busy Harbor Boulevard; where, as shown in Appendix H-1, it had an unobstructed view of both the MGS site and the neighboring McGrath Peaker Plant. Perceived noise sources contributing to the ambient sound environment included passing road traffic, aircraft overflights, and sounds from either MGS or neighboring oil-and-gas industrial facilities to the north, west, and south. The average hourly L_{90} for the four consecutive quietest hours (December 16, 2014, 00:25 a.m. to 04:25 a.m.) is 42.3 dBA. No precipitation occurred during this 4-hour time period.

Table 4.7-4 presents selected hourly SPL data from Tables 4.7-2 and 4.7-3, showing what outdoor ambient sound levels were measured at LT-3 when MGS Units 1 and 2 were both operating under load and at their highest output during the indicated days. Similarly, measured SPL at LT-3 is indicated during the period when MGS Unit 3 was operating at its peak (but without MGS Unit 1 or Unit 2 operating). As discussed in Section 4.7.2, these ambient sound levels represent one of the baseline condition scenarios (i.e., existing ambient) against which predicted project noise is compared to assess impacts.

ST Measurements

ST measurements were conducted repeatedly at the LT monitoring sites, so that investigators could collect measurement data from these additional SLMs and subsequently compare them with LT data. Additionally, these investigator-attended ST measurements provided an opportunity to witness and document observed or perceived distinct acoustical contributions to the outdoor ambient sound environment during sample daytime (7 a.m. to 7 p.m.), evening (7 p.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) periods.

Additional ST measurements were conducted on the MGS site, including a location approximately 400 feet north of MGS Unit 2. At this position, shown in Photograph 8 in Appendix H-1, SPL was measured over several hours, and included the following sample levels and indicated conditions:

- For the 12:25 p.m. to 1:25 p.m. hour prior to MGS Unit 1 being under load on December 16, 2014, hourly L_{eq} was 57.6 dBA, with L_{50} at 57.3 dBA and L_{90} at 57.1 dBA.

- For the 5:25 p.m. to 6:25 p.m. hour that included MGS Unit 1 operation under peak load at 5:30 p.m. and MGS Unit 2 under peak load at 5:45 p.m. on December 16, 2014, hourly L_{eq} was 58.4 dBA, with L_{50} at 57.9 dBA and L_{90} at 57.3 dBA.

The similarity of the values for these three acoustical descriptors during each of these measured hours indicates what was generally observed by investigators onsite: outdoor ambient sound at the position was dominated by several continuously operating systems associated with the MGS facility. Acoustical contribution from the ocean surf (at a distance of about 800 feet away) to the west was likely not significant due to the presence of the onsite sand dune ridge (parallel to the western fence line, and at a distance of only 200 feet from the SPL measurement position) that provided linear occlusion (i.e., sound attenuation via "barrier effect"). This location was also 1,100 feet from North Harbor Boulevard, making road traffic noise an unlikely significant acoustical contributor. FTA *Transit Noise and Vibration Impact Assessment* guidance (U.S. Department of Transportation, 2006a) suggests that for an "other roadway" like North Harbor Boulevard, traffic noise would be no greater than 50 dBA L_{eq} at this distance.

McGrath Peaker

Operation of the McGrath Peaker Plant was not apparent during investigator-observed portions of the SPL measurement survey period. Lacking SPL measurement data for this facility, operation noise from McGrath Peaker can be roughly predicted as described in the following paragraphs.

According to publicly available Southern California Edison documentation (SCE, 2013), the McGrath Peaker is a General Electric (GE) LM6000 system rated for 49 megawatts (MW) of electricity production when fully operational. This study will assume that this technology is essentially similar—with respect to aggregate operational noise production—to a pair of LM6000 systems that were considered by the City of Riverside for its proposed Riverside Energy Resource Center (RERC) Units 3 and 4. At a distance of 2,870 feet, the nearest noise-sensitive receiver location with respect to RERC, the predicted operation noise level was 43 dBA, as reported in the California Energy Commission's (CEC's) Final Initial Study (CEC, 2008).

Backwardly applying point-source geometric divergence (i.e., the "6 dB per doubling of distance" rule-of-thumb for outdoor sound attenuation) and atmospheric acoustical absorption at a rate of 1 dBA per 1,000 feet of distance that sound travels between source and receiver, the predicted SPL of 43 dBA means the L_w of each LM6000 at RERC was approximately 110 dBA. This L_w is comparable to GE-derived values disclosed in an appendix to the RERC small power plant exemption application (GE, 2004).

If the aggregate sound power of McGrath Peaker operating at full load is also 110 dBA, then the predicted SPL at LT-3, which is approximately 1,100 feet away, would be 50 dBA. If this supposition was valid, then a comparison of this predicted 50 dBA value with measured L_{90} values at LT-3 that were less, suggests that McGrath was likely not operating at night.

Influence of Ocean Surf Noise on Ambient Sound Environment

Table 4.7-5 compares SPL data measured concurrently at three positions near Oxnard Shores as shown on Figure 4.7-1 for two separate nighttime periods as shown. Measurements were conducted at night to minimize the influence of occasional road traffic on West 5th Street and Mandalay Beach Road.

The predicted drop-off or dBA difference in SPL from measurement position "Beach Crest" (BC) to "Oxnard Shores West" (OSW) shown in Table 4.7-5 assumes the following expectations of arithmetically additive natural sound-attenuation components:

- 9 dBA from geometric divergence of sound from a line source (i.e., the cyclical pounding surf), approximated as 3 dBA per doubling of distance;

- Approximately 5 dBA due to the crest of the beach intervening (i.e., creating a natural barrier effect) with the direct sound path; and
- About 1 to 2 dBA due to acoustical absorption from sound traversing over sand and through the air.

The difference between OSW and LT-1 is anticipated to be modest (only 3 dBA, as shown in Table 4.7-5), given that the surf sound only travels additional distance between these two measurement locations.

Because the predicted differences appear consistent (i.e., within 2 dBA), with measured differences in L_{eq} and L_{90}, this analysis concludes that the surf sound was indeed a dominant source of continuous background noise at LT-1 and OSW. Conditions that contribute to such surf sound can vary by day, and include tides, winds, and wave height. Therefore, ambient outdoor SPL measured at these two positions at a future date may be different from what was measured during the baseline SPL survey as reported in this document.

4.7.2 Environmental Consequences

4.7.2.1 Significance Criteria

4.7.2.1.1 CEQA

The following sections evaluate the potential impacts to noise and vibration associated with construction and operation of the project. Appendix G of the California Environmental Quality Act (CEQA) describes project-related effects that would normally be considered to have a significant effect on the environment. Based on this guidance, project-related noise and vibration impacts are considered significant if the project would instigate any of the following:

- XII. NOISE a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

- XII. NOISE b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

- XII. NOISE c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

- XII. NOISE d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

- XII. NOISE e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

- XII. NOISE f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.

The last of the bulleted list, item XII. NOISE f), does not apply to P3 due the lack of a private airstrip in its vicinity and is therefore not addressed below. The remaining criteria are evaluated in the following subsections.

4.7.2.1.2 CEC

In its noise and vibration analyses of this type of project, the CEC typically concludes (per application of XII. NOISE c) from the above CEQA Appendix G significance guidance criteria) that a potential for a significant noise impact exists where the noise of a project plus the background exceeds the background by more than 5 dBA at the nearest sensitive receptor. An increase in background noise levels up to and including 5 dBA in a residential setting is considered insignificant, while an increase of more than 10 dBA is considered clearly significant. An increase of between 5 and 10 dBA should be considered an adverse effect, with significance or insignificance depending on factors that include: resulting noise level, frequency and duration of noise, number of affected persons, and land use type of the affected receptors.

The CEC usually considers construction activity noise insignificant in terms of CEQA compliance, as long as the activity is temporary and use of heavy equipment (and other related noise-producing processes or activities) occurs only during daytime hours.

4.7.2.2 Excess of Standards

Sound will be produced at the proposed project site during construction, operation, and maintenance of P3. The following subsections evaluate predicted construction and operation noise effects with respect to applicable LORS that are detailed in Section 4.7.5. In summary, such effects would be considered significant if:

- Project *construction* noise occurs outside of 7 a.m. to 6 p.m. on weekdays and Saturdays, and all day on Sundays, and such noise causes an exterior sound level at an Oxnard residential receptor to exceed the following limits:
  - 55 dBA hourly L_{50} during the daytime hours (7 a.m. to 10 p.m.) and 50 dBA hourly L_{50} during the nighttime hours (10 p.m. to 7 a.m.).
  - The existing outdoor ambient hourly sound level (L_{50}), if it already exceeds 55 dBA hourly L_{50} during the daytime hours (7 a.m. to 10 p.m.) and 50 dBA hourly L_{50} during the nighttime hours (10 p.m. to 7 a.m.).
- Project *construction* noise causes an exterior sound level at an unincorporated Ventura County residential receptor to exceed the following limits:
  - In the evening (7 p.m. to 10 p.m.), for residential receptors, the noise threshold criteria (NTC) would be the greater of 50 dBA hourly L_{eq} or the existing ambient hourly L_{eq} plus 3 dBA.
  - At night (10 p.m. to 7 a.m.), for residential or live-in institutional receptors, the NTC would be the greater of 45 dBA hourly L_{eq} or the existing ambient hourly L_{eq} plus 3 dBA.
- Project *operation* noise causes an exterior sound level at an Oxnard residential receptor to exceed the following limits:
  - 55 dBA hourly L_{50} during the daytime hours (7 a.m. to 10 p.m.); and 50 dBA hourly L_{50} during the nighttime hours (10 p.m. to 7 a.m.).
  - The existing outdoor ambient hourly sound level (L_{50}), if it already exceeds 55 dBA hourly L_{50} during the daytime hours (7 a.m. to 10 p.m.); and 50 dBA hourly L_{50} during the nighttime hours (10 p.m. to 7 a.m.).

- Project *operation* noise causes an exterior sound level at an unincorporated Ventura County residential receptor to exceed the following limits:
  - Hourly L_{eq} of 55 dBA or ambient noise level plus 3 dBA, whichever is greater, during any hour from 6:00 a.m. to 7:00 p.m.
  - Hourly L_{eq} of 50 dBA or ambient noise level plus 3 dBA, whichever is greater, during any hour from 7:00 p.m. to 10:00 p.m.
  - Hourly L_{eq} of 45 dBA or ambient noise level plus 3 dBA, whichever is greater, during any hour from 10:00 p.m. to 6:00 a.m.
- Project *maintenance* noise occurs outside of 7 a.m. to 6 p.m. on weekdays and Saturdays, and before 9 a.m. and after 6 p.m. on Sundays, and such noise causes an exterior sound level at an Oxnard residential receptor to exceed the following limits:
  - 55 dBA hourly L_{50} during the daytime hours (7 a.m. to 10 p.m.); and 50 dBA hourly L_{50} during the nighttime hours (10 p.m. to 7 a.m.).
  - The existing outdoor ambient hourly sound level (L_{50}), if it already exceeds 55 dBA hourly L_{50} during the (7 a.m. to 10 p.m.); and 50 dBA hourly L_{50} during the nighttime hours (10 p.m. to 7 a.m.).
- Project *maintenance* noise causes an exterior sound level at an unincorporated Ventura County residential receptor to exceed the following limits:
  - Hourly L_{eq} of 55 dBA or ambient noise level plus 3 dBA, whichever is greater, during any hour from 6:00 a.m. to 7:00 p.m.
  - Hourly L_{eq} of 50 dBA or ambient noise level plus 3 dBA, whichever is greater, during any hour from 7:00 p.m. to 10:00 p.m.
  - Hourly L_{eq} of 45 dBA or ambient noise level plus 3 dBA, whichever is greater, during any hour from 10:00 p.m. to 6:00 a.m.
- Project *construction, operation, or maintenance* noise causes an exterior sound level at an Oxnard or unincorporated Ventura County residential receptor to exceed the following limit:
  - A difference of greater than 10 dBA between the existing outdoor ambient hourly L_{90} and the predicted project hourly noise level (L_{90}).

4.7.2.2.1 Construction Noise Predictions

Construction of the project is expected to be similar to other power plants in terms of schedule, equipment used, and related activities. The overall noise level will vary during the construction period, depending upon the phasing and concurrence of different construction activities and their general locations or zones of the project area.

While construction activities involve both stationary and mobile operating equipment and processes that can complicate accurate prediction, this analysis relies on a conservative noise prediction approach as detailed in the following paragraphs.

Methodology

Information regarding anticipated construction equipment (including quantities, types, usage percentages, and rated horsepower) is provided in the Project Description (see Table 2.9-3). Using this information and SPL data from the Federal Highway Administration (FHWA) Roadway Construction Noise Model User's Guide (U.S. Department of Transportation, 2006b) for similar equipment types aggregate SPL from expected operating construction equipment can be estimated at a neighboring noise-sensitive receiver for each month of the construction schedule. This estimation process includes the following assumptions:

- Acoustical ground absorption is anticipated to attenuate construction noise by no more than 4.8 dBA, as indicated by algorithms presented in International Organization of Standardization (ISO) 9613-2 (ISO, 1996).
- Acoustical absorption due to sound traverse through the air is no greater than 1 dBA per 1,000 feet.
- All construction activity noise emits, on average, from a single point: the geographic center of the proposed GE 7HA.01 turbine set on the P3 site within the MGS property.
- Construction and demolition activities[1] can be concurrent, as indicated by the anticipated equipment roster and monthly schedule shown in Table 2.9-3 of the Project Description.
- Meteorological conditions are considered calm or "wind neutral."
- Pile-driving, if required, would be an additional equipment noise source that generates 95 dBA at a distance of 50 feet, and has a usage of 20 percent (U.S. Department of Transportation, 2006b).

Results

Table 4.7-6 presents the low and high ends of a range of anticipated combined construction and demolition noise sound levels (dBA) at each of the indicated noise-sensitive receivers. Table 4.7-6 also shows the sequential month during which the quietest and loudest noise level is expected, as well as the approximate horizontal distances (in meters) from the indicated noise-sensitive receivers to the GE 7HA.01 turbine position.

Should impact or vibratory-type pile driving be required as part of constructing the P3 equipment foundations, the added noise would increase the combined (i.e., aggregate of construction and demolition) high-estimate values in Table 4.7-6 by 2 dBA, and the low-estimate values by 9 dBA.

Discussion

Construction Noise at Offsite Receptors

As indicated in Table 4.7-6, the fourth month of the construction schedule is predicted to be the loudest, which reflects a time period characterized as having the most intense onsite construction and demolition activity levels, inclusion of the loudest equipment and vehicles, or both of these factors. Table 4.7-7 takes this "high estimate" and compares it with summarized noise impact criteria described in Section 4.7.2.2 for each of several representative daytime, evening and nighttime measured outdoor ambient noise environments as follows:

[1] Demolition includes removal of an abandoned fuel pipe and other infrastructure needed to allow construction of P3 and ancillary systems.

- For LT-2, and based on available ST measurement data:
  - daytime ambient sound when MGS Units 1 and 2 were in operation; and
  - evening and nighttime when MGS units were not in operation.

- For LT-1 and LT-3, and based on available LT measurement data:
  - daytime ambient sound when MGS Units 1 and 2 were in operation and at peak levels on two different days;
  - quietest hour of daytime ambient sound when MGS Units 1 and 2 were not in operation (i.e., under load);
  - daytime ambient sound when MGS Unit 3 was in operation and at full load;
  - quietest evening hour of ambient sound when MGS Units 1 and 2 were not in operation (i.e., under load); and
  - average of 4 quietest consecutive hours (in terms of L_{50} and L_{90} descriptors) when MGS Units 1 and 2 were not in operation (i.e., under load).

- For the OSW location, and based on available ST measurement data:
  - sample nighttime sound level when MGS units were not in operation.

From Table 4.7-7, potentially significant construction noise impacts are apparent at LT-3 during nighttime hours, per City of Oxnard criteria.

If combined construction noise during nighttime hours were to include pile driving, then the expected project sound level at LT-3 would cause greater than a 10-dBA increase in ambient sound level, exceeding the CEC criterion.

Table 4.7-8 indicates that during the quietest month of construction, no significant impacts are expected at any of the representative noise-sensitive receptors. Even if pile-driving were to occur during this quietest month, impacts would still not be significant.

Due to the variance of predicted construction noise between the month of greatest activity (or usage of loudest equipment and processes) and the month having the least, this study concludes that nighttime construction noise may reach significantly impactful levels for only portions of the total construction period, and that potential mitigation measures presented in Section 4.7.4 should consequently be tailored to address only those months when significant impacts might be expected. Of course, if construction activity (including potential pile driving) only occurs during daytime and evening hours, then no significant construction noise impacts are expected.

Construction Occupational Noise Exposure

Outdoor sound levels within the project boundary during construction may exceed the Occupational Safety and Health Administration (OSHA) 90 dBA threshold near certain operating or idling powered mobile and stationary equipment, but these levels will diminish with distance from these sources. Consistent with OSHA/California Occupational Safety and Health Administration (Cal-OSHA) guidance and regulatory compliance requirements, project contractors will post warnings with respect to areas that may be noise-level hazards, and provide construction workers with OSHA-approved hearing protection devices as part of an applicable hearing conservation program.

Construction Laydown, Staging, and Parking Areas

As shown on Figure 2.9-3 of the Project Description, the gas turbine erection area and primary material storage and laydown area are in the immediate vicinity of the proposed P3 site on MGS property. Contractors and equipment suppliers will use the laydown areas during construction to coordinate delivery of equipment and materials, construction, and construction worker parking and processing.

Because this primary material storage and laydown area is essentially co-located with the construction activity, this analysis assumes that noise from idling trucks in that area have already been included in the construction noise analysis, as discussed in the previous paragraphs. However, a proposed overflow material storage and laydown area also shown on Figure 2.9-3 is approximately 1,100 feet southeast of the aforementioned primary material storage and laydown area. This overflow laydown area is much closer to noise-sensitive receiver LT-3 and should be considered separately.

If one assumes an idling dump truck (with reference SPL at 50 feet equal to 84 dBA L_{max}, and 40 percent acoustical use factor, per Table 1 of the FHWA Roadway Construction Noise Model User's Guide [U.S. Department of Transportation, 2006b]) and an operating manlift (85 dBA L_{max} at 50 feet, with 20 percent acoustical use, per FHWA) would be the loudest two types of equipment operating at the overflow laydown area; the composite noise level would be 82 dBA L_{eq} at 50 feet. Because the closest representative noise-sensitive receptor (LT-3) to this laydown area is approximately 1,400 feet away, the expected noise level would be no greater than 47 dBA. This predicted level complies with all applicable construction noise impact criteria, and would therefore be anticipated to be a less-than-significant impact.

4.7.2.2.2 Construction Traffic Noise Predictions

From expected construction delivery data in Table 2.9-2 of the Project Description, an average of approximately 107 deliveries would occur each month of project construction. Figure 2.8-3 from the Project Description shows that up to approximately 90 construction staff would be onsite. Conservatively assuming one passenger vehicle per worker makes a trip to and from the MGS site during a typical workday, and that each construction delivery involves a separate truck trip (equivalent to three passenger vehicles) to and from the MGS site, the added average daily vehicle traffic to Harbor Boulevard would be as much as 201.

According to 2014 Traffic Volumes on Ventura County Roadways (County of Ventura, 2014), an average of 17,600 vehicles per weekday travel on Harbor Boulevard south of Gonzales Road. With such significant existing daily traffic volumes, the proposed addition of 201 vehicle-trips would represent only about a 1 percent increase in daily volumes, and therefore much less than the 50 percent increase needed (assuming vehicle type proportions and speeds are the same) to cause a perceptible 3 dBA rise in traffic noise. On this basis, a 1 percent traffic volume increase would result in much less than a 1 dBA increase in daily road traffic noise, and would not be considered a significant impact.

4.7.2.2.3 Operation Noise Predictions

Upon completion of construction and commissioning, P3 would generate noise as a result of nominal operations. At times, P3 operation would be concurrent with operation of MGS Unit 3, which will remain after MGS Units 1 and 2 have been retired. Therefore, this analysis of environmental noise effects considers two separate scenarios, representing different operation and site conditions, as described below:

- P3 Online and MGS Unit 3 Online; MGS Units 1 and 2 Offline (Retired), and
- P3 Online and MGS Unit 3 Offline; MGS Units 1 and 2 Offline (Retired).

Note that under these scenarios, "retired" MGS Units 1 and 2 still have their potentially sound-path occluding structures in the sound propagation prediction model described in the following paragraphs.

Because MGS Unit 3 operation is not associated with P3, both scenarios are studied to help illustrate the differences in predicted sound levels, depending on MGS Unit 3 operational status. For instance, operation of MGS Unit 3 (a part of the non-Project outdoor ambient sound environment) may occur during the daytime, evening, or nighttime.

Methodology

The Cadna/A® Noise Prediction Model (Version 4.5.147) was used to estimate the aggregate SPL from nominal P3 operations at the studied noise-sensitive receptors appearing on Figure 4.7-1. Cadna/A® is a Windows®-based software program that predicts noise levels near industrial noise sources based on ISO 9613-2 standards for outdoor sound propagation calculation. The model uses these industry-accepted propagation algorithms and accepts L_w (in dB re: 1 picowatt) provided by the equipment manufacturer and other sources. In the case of this operational noise analysis, L_w for nominal steady-state operation at OBCF resolution was sourced as shown in Table 4.7-9. (The OBCF detail is provided in Appendix H-2.) The software's calculations account for classical sound-wave geometric divergence, plus attenuation factors resulting from air absorption, basic ground effects, and barrier/shielding. To account for terrain effects, available topographical data were incorporated into Cadna/A® as part of the model space.

Additional Cadna/A® model configuration settings and operations noise analysis assumptions are as follows:

- Outdoor temperature: 10 degrees Celsius (ºC)
- Relative humidity: 70 percent
- Wind speed and direction – three separate cases have been considered:
  - Calm conditions (average wind speed equals zero);
  - Prevailing wind #1 conditions (average 6 miles per hour [mph] from the west), which appear representative of Oxnard, California for the months of April through October; and
  - Prevailing wind #2 conditions (average 7 mph from the east), which appear representative of Oxnard, California for the months of November through March.
- Average ground absorption: 0.5 (representing a conservative blend of hard, reflective surfaces that tend towards zero, and highly absorptive ground cover that approaches unity).
- Although there are pre-existing permanent buildings near the project site that are associated with MGS operations and have noise-producing equipment such as operating heating, ventilation and air conditioning systems, they are not considered significant noise sources to model.
- The following P3 systems are not anticipated to be major noise-producing sources: PEECC, LCI/EX compartment, fire protection enclosure, CCW pumps, evaporative cooling-water pump(s), water mist fire protection enclosure, water wash skid, fuel-gas absolute separator, fuel-gas chromatograph, continuous emissions monitoring system enclosure, emergency diesel generator, air dryer, air receiver, safety shower/eye wash.

The effects of the three aforementioned meteorological cases were studied for each of the two scenarios; hence, three predictive models for P3 operations noise propagation to nearby noise-sensitive receptors include concurrent MGS Unit 3 operation as part of the non-project background, while three additional models consider P3 operational but assume that MGS Unit 3 is offline.

Results

Predicted noise levels during operation for each of the two scenarios are shown in Table 4.7-10. Figures 4.7-1 through 4.7-3 display noise contours, superimposed on aerial imagery of the MGS and its surroundings, for the three meteorological cases that do not include MGS Unit 3 operation.

Tables 4.7-11a, 4.7-12a, and 4.7-13a compare the predicted P3 operational noise levels with summarized noise-impact criteria described in Section 4.7.2.2 for each of several representative daytime, evening, and nighttime measured outdoor ambient noise environments as follows:

- For LT-2, and based on available ST measurement data:
  - daytime ambient sound when MGS Units 1 and 2 were in operation; and
  - evening and nighttime when MGS units were not in operation.

- For LT-1 and LT-3, and based on available LT measurement data:
  - daytime ambient sound when MGS Units 1 and 2 were in operation, and at peak levels on two different days;
  - quietest hour of daytime ambient sound when MGS Units 1 and 2 were not in operation (i.e., under load);
  - quietest evening hour of ambient sound when MGS Units 1 and 2 were not in operation (i.e., under load); and
  - average of four quietest consecutive hours (in terms of L_{50} and L_{90} descriptors) when MGS Units 1 and 2 were not in operation (i.e., under load).

- For the OSW location, and based on available ST measurement data:
  - sample nighttime sound level when MGS units were not in operation.

These representative outdoor ambient sound environments are the same as those studied for construction noise prediction, but exclude the measured daytime cases at LT-1 and LT-3 when MGS Unit 3 was operating. Tables 4.7-11b, 4.7-12b, and 4.7-13b add these two cases to the P3 operations noise impact assessment, and logarithmically add predicted MGS Unit 3 sound to the measured ambient sound levels for the other studied environments. In this way, MGS Unit 3 operation is not "double counted" in Tables 4.7-11b, 4.7-12b, and 4.7-13b.

Discussion

Tables 4.7-11b, 4.7-12b, and 4.7-13b illustrate that with respect to applicable regulatory criteria, no significant impacts are anticipated when P3 is operating.

The highest predicted P3 operation noise level at LT-1 and OSW is 41 dBA, which is 9 dBA less than the allowable City of Oxnard nighttime criterion of 50 dBA. It is also lower than measurements of existing ambient outdoor SPL at these two locations that are influenced by ocean surf sound contribution. Although producing sound that varies with tidal conditions and other factors, the ocean surf is nonetheless a reliable source of continuous noise that is in proximity to these two representative noise-sensitive receivers.

Because existing ambient sound at LT-1 and OSW will either be comparable to or exceed the SPL of predicted acoustical contribution from P3 operations, future compliance assessment might be seen as difficult—if not impossible. For this reason, and as detailed in Section 4.7.4, an extrapolation technique using SPL measurement data from locations much closer to the project boundary is recommended for determining compliance with the applicable noise criteria. The technique is akin to measures that the CEC has historically described as part of a Condition of Certification on a power project where similar compliance assessment challenges are anticipated.

Tonal Noise

The combustion turbine generators, transformers, and combustion turbine inlet compressors produce tonal sounds; which, under the right environmental conditions, can tend to be more readily audible and noticeable at noise-sensitive receivers. Therefore, this study relies on proper design and engineering of

the project features and systems so that no prominent or tonal noise emissions will affect the noise-sensitive receptors, and impacts will be less than significant.

Operations Occupational Noise Exposure

Acoustical specifications from the Applicant's candidate supplier of P3 systems indicate that operational noise levels are to remain below an average of 85 dBA along an "envelope" that surrounds the relevant equipment surfaces at a distance of 1 meter (3 feet). The requirement for a hearing conservation program will be evaluated. Any employees working at the P3 facility in the MGS site, with potential exposure to noise sources having SPL that may meet or exceed applicable OSHA or Cal/OSHA thresholds, will be identified.

Power Transmission

Noise sources associated with power transmission (aside from transformers associated with P3 that are already in the operational noise propagation models) include occasional breaker operation in the switchyard, corona noise, and very low magnetostriction hum from the conductors. Breaker noise is considered impulsive in nature, with a very short duration, and may occur only a very few times per year. Corona noise is characterized as a buzz or hum, and is usually worse when the conductors are wet, such as in rain or fog.

Having conducted noise tests and relevant studies on the topic, the Electric Power Research Institute (EPRI) has published reference material on transmission line noise. Consistent with all acoustic textbooks' discussion of noise propagation from a line source, EPRI states that noise produced by a conductor decreases at a rate of 3 dB per doubling of distance from the source. The EPRI Transmission Line Reference Book indicates that the audible noise from a typical 230-kilovolt line with two conductors per phase would likely be less than 40 dBA at a distance of 40 feet from the outside conductor at ground level. If only one conductor per phase is used, the noise level will be less. Because this level of noise is very likely to be inaudible with respect to existing levels of community noise at the noise-sensitive receivers studied in this analysis, such corona noise is expected to be a less-than-significant noise impact.

4.7.2.2.4 Operation Traffic Noise Predictions

The post-construction workforce that will operate P3 will represent virtually no net change in operations employees at the MGS site; therefore, no change in operations traffic is expected, and no corresponding change in existing operations traffic noise is anticipated. Therefore, no impact from future operations road traffic is expected.

4.7.2.3 Groundborne Vibration

Heavy equipment (e.g., combustion turbine generator) installed for P3 is typically designed and engineered to be balanced, and therefore produce very low operational vibration levels throughout the life of the project. Although an imbalance could contribute to ground-vibration levels in the vicinity of the equipment; typically, vibration monitoring and vibration-isolating mounting systems installed in such equipment are designed to ensure that the equipment remains balanced, or has its operation suspended for inspection and service as required.

Additionally, the distance of the nearest noise-sensitive receiver (LT-3) to project construction or operational activities makes it highly unlikely—due to natural attenuation of vibration energy through sandy soils like those of the project vicinity—that perceptible vibration from the project would be experienced. Therefore, vibration impacts are anticipated to be less than significant.

4.7.2.4 Permanent Ambient Noise Increase

As discussed in Section 4.7.2.2, some operational scenarios are predicted to cause permanent increases of outdoor ambient sound level at the nearest noise-sensitive receivers. Tables 4.7-14a-b, 4.7-15a-b, and 4.7-16a-b are similar to Tables 4.7-11a-b, 4.7-12a-b, and 4.7-13a-b, but show the estimated future ambient level (i.e., the logarithmic addition of existing ambient sound, plus predicted MGS Unit 3 sound, plus the predicted P3 operations noise) and the corresponding increase over existing ambient. Because Section 4.7.2.2 already concludes that P3 operational noise is not expected to produce significant noise impacts at the nearest noise-sensitive receivers, Tables 4.7-14a-b, 4.7-15a-b, and 4.7-16a-b only provide information about the predicted future sound levels, and do not indicate any new noise impacts that would be considered significant.

4.7.2.5 Temporary Ambient Noise Increase

As discussed in Section 4.7.2.2, construction activities are predicted to cause temporary increases of outdoor ambient sound level at the nearest noise-sensitive receivers. Tables 4.7-17 and 4.7-18 are similar to Tables 4.7-7 and 4.7-8, but show the estimated future ambient level (i.e., the logarithmic addition of existing ambient sound plus the predicted project construction noise estimate) and the corresponding increase over existing ambient. Tables 4.7-17 and 4.7-18 only provide the reader information about the predicted future sound levels and do not indicate additional noise impacts that would be considered significant.

4.7.2.6 Noise from Nearby Municipal Airport

Oxnard Airport, adjacent to West 5th Street between North Victoria Avenue and North Ventura Road, is approximately 1.8 miles east of the project site. Although noise from aircraft overflights (generally traveling eastward towards the eastern end of the airport's runways) was observed and measured during the baseline outdoor ambient sound-level survey described in Section 4.7.1.3, ambient outdoor noise on MGS property is dominated by existing facility operations and offsite sounds such as nearby roadway traffic on Harbor Boulevard and neighboring industrial (e.g., oil-and-gas) facilities like DCOR. Noise from existing aviation traffic associated with Oxnard Airport is not expected to be a significant acoustical contributor to the onsite outdoor ambient sound environment. Therefore, therefore the combination of project-related noise and ambient aviation noise is not anticipated to expose people working or residing in the project area to excessive levels of noise. Impacts would be less than significant.

4.7.3 Cumulative Impacts Analyses

Because noise naturally dissipates with distance due to a variety of sound attenuation factors such as geometric divergence, atmospheric acoustical absorption, and ground-cover effects, the potential cumulative noise impact at a noise-sensitive receiver location will depend primarily on the proximity of the multiple noise-producing projects and the intensity of their major sources of sound.

Among the five projects listed in Section 4.0, the North Shore Subdivision, Avalon Homes Subdivision, and Anacapa Townhomes range from 1,500 to 3,000 feet to noise-sensitive receiver locations LT-1, OSW, and LT-3. (LT-3, in fact, represents a future receiver from the North Shore Subdivision.) At these distances, and depending on intensity, schedule, and areas of construction activities associated with any of these three projects, construction noise might be an audible acoustical contributor to the outdoor ambient sound level at these three representative receiver locations. As the following example illustrates, the cumulative noise effect may be audible, but is not likely to be impactful.

As mentioned in Section 4.7.2.2, estimated construction noise from a laydown area at a distance of 50 feet is 82 dBA. Assuming this reference level would describe the closest construction activity noise from any one of these three projects, the SPL over this 1,500- to 3,000-foot distance would range from 46 to

39 dBA, respectively. The high end of this range, 46 dBA, is comparable to the P3 construction noise low estimate of 43 dBA at LT-1. In combination, cumulative construction noise from P3 (using the low estimate) and one of these other projects—assuming activity is concurrent—would only be 47 dBA. Although the combination represents what could be up to a perceptible 4 dBA rise over the noise from just one project, the combined level is still less than the City of Oxnard noise limits. Also, since the measured outdoor ambient sound at LT-1 is at least 43 dBA at night, such a cumulative construction noise level (from P3 and another concurrent project) would only raise this ambient level to 48 dBA, which is also still less than the City of Oxnard nighttime limit of 50 dBA, and would represent only an insignificant 5 dBA ambient increment per CEC guidelines.

The other two projects, Rancho Victoria Plaza Shopping Center and the Teal Club Specific Plan, are much more distant—over a mile from LT-1 and LT-3—and therefore not expected to generate noise that would be acoustically significant with respect to cumulative noise levels at these two P3 noise-sensitive receivers.

Therefore, cumulative noise impacts would be less than significant.

4.7.4 Mitigation Measures

Although the project is not expected to result in significant noise impacts, this section presents measures that will be implemented to avoid and/or reduce project-related impacts from noise and vibration.

NOISE-1 Provide Means for Noise Complaint Reporting

The Applicant shall establish a telephone hot-line for use by the public to report any significant adverse noise conditions associated with the construction and operation of the project. If the telephone is not staffed 24 hours per day, the Applicant shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This hot-line telephone number shall be posted at the project site during construction in a manner visible to passersby. This telephone number shall be maintained until the project has been operational for at least 1 year.

NOISE-2 Noise Complaint Investigation

Throughout the construction and operation of the project, the Applicant shall document, investigate, evaluate, and attempt to resolve all legitimate project-related noise complaints. The Applicant or its authorized agent shall:

- Use the Noise Complaint Resolution Form typically suggested by CEC, or functionally equivalent procedure, to document and respond to each noise complaint;
- Attempt to contact the person(s) making the noise complaint within 24 hours;
- Conduct an investigation to attempt to determine the source of noise related to the complaint; and
- If the noise complaint is legitimate, take all reasonable measures to reduce the noise at its source.

NOISE-3 Construction Noise Mitigation

If high estimates of predicted noise from the combination of construction and demolition activities presented in Section 4.7.2.2 are accurate and represent sound levels that nearby noise-sensitive receptors might experience during anticipated schedule progress, it would appear that only nighttime construction noise (with respect to LT-3) would need implementation of one or more effective noise-mitigation measures to help ensure compliance with applicable impact criteria. In addition to NOISE-1 and NOISE-2, the following options for mitigation measures include or are based on guidance from the County of Ventura Construction Noise Threshold Criteria and Control Plan (County of Ventura, 2010).

- Equipment Noise Reduction

  - Pneumatic impact tools and equipment used at the construction site shall have intake and exhaust mufflers recommended by the manufacturers thereof, to meet relevant noise limitations.

  - Line or cover hoppers, storage bins, and chutes with sound-deadening material (e.g., apply wood or rubber liners to metal bin impact surfaces).

  - Provide factory-approved mufflers, acoustical lining, or acoustical paneling for other noisy equipment, including internal-combustion engines.

  - Use construction equipment with quieter power sources, such as:

    - Electric instead of diesel-powered equipment.
    - Hydraulic tools instead of pneumatic tools.
    - Electric saws instead of air- or gasoline-driven saws.

  - Turn off idling equipment when not in use for periods longer than 30 minutes. (This measure can be particularly helpful with respect to the City of Oxnard's usage of L_{50} as the statistical descriptor for noise impact assessment, because a dominant noise source lasting less than 30 cumulative minutes in any 1 hour would likely result in an ambient SPL measurement L_{50} value that would be considerably less than one if the dominant source were active for more than 30 minutes. In other words, keep the dominant source inactive for more than 50 percent of the time.)

- Equipment Operation

  - Operate equipment so as to minimize banging, clattering, buzzing, and other annoying types of noises, especially near residential and other noise-sensitive areas during the evening and nighttime hours.

  - To the extent feasible, configure the construction site in a manner that keeps noisier equipment and activities as far as possible from noise-sensitive locations and nearby buildings.

  - To the extent practical and unless safety provisions require otherwise, all audible back-up alarms should be disarmed (or adjusted downward in sound level, reflecting an expected lower background level while still maintaining adequate signal-to-noise ratio for alarm effectiveness) during evening and nighttime periods. Signal persons and strobe lights, or alternative safety equipment and/or processes as allowed, must be used during these periods when back-up alarms are disarmed.

  - Maximize physical separation, as far as practicable, between noise generators and noise receptors. Separation includes the following measures:

    - Provide temporary enclosures for stationary items of equipment and noise barriers around particularly noisy areas at the project site.
    - Locate stationary equipment to minimize noise and vibration impacts on the community.

  - Minimize noise-intrusive impacts during most noise-sensitive hours.

- Plan noisier operations during times of highest ambient noise levels (e.g., peak commuting time periods ["rush hour"] on nearby Harbor Boulevard).
- Keep noise levels relatively uniform; avoid excessive and impulse noises.

NOISE-4 Offsite Operational Noise

The project as currently designed would not be expected to cause significant adverse noise impacts at LT-1, LT-2, LT-3, and OSW; therefore, no additional mitigation of operational noise is required with respect to expected P3 operations noise at these representative existing and future noise-sensitive residential receivers. To ensure that acoustical design goals are met by the P3 facility while in operation, the following measure (anticipated by the Applicant to be one of the CEC Conditions of Certification for the project) is described.

- Operational Noise Attenuation

  – The design and implementation of the project shall include appropriate noise attenuation measures adequate to ensure that the noise level produced by operation of the project will not exceed an hourly average exterior noise level of more than:

    - 43 dBA L50 at LT-1;
    - 42 dBA Leq at LT-2; and
    - 8 dBA L50 at LT-3.

    To account for a degree of uncertainty inherent in the predictive modeling used for this impact assessment, the above values for LT-1, LT-2, and LT-3 are 2 dBA higher than predicted levels shown for these noise-sensitive receivers in Table 4.7-10. These above values would still result in no significant impacts. In addition, no new pure tone components may be introduced, and no single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints, as determined by the compliance project manager (CPM).

  – Within 30 days of P3 first achieving a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct a 25-hour noise survey. The noise survey shall also include short-term measurement of one-third octave-band SPL to ensure that no noise tones have been introduced. If the results from the operational noise survey indicate that pure tones are present, then additional noise control measures shall be implemented to eliminate the pure tones. Irrespective of the specific method used for determining P3's noise level, the character of the project's noise shall be evaluated at the nearest residence to determine the presence of tones or other dominant sources of project noise.

    The measurement of project noise for the purposes of demonstrating compliance with this measure may be made at a location acceptable to the CPM that is closer to the project than the nearest residence (e.g., 400 feet from P3's acoustic center in the direction of residences), and this measured level then mathematically extrapolated to determine P3's noise contribution at the nearest residence. If the results from the operational noise survey indicate that the P3-only noise levels exceed the above-bulleted limits for any given hour at any residence, additional noise control measures shall be implemented to reduce operational noise to a level of compliance with this limit.

    Within 30 days after completing the post-construction operational noise survey, the project owner shall submit a summary report of the survey to the CPM. Included in the survey report will be a description of any additional noise control measures necessary to achieve

compliance with the above-listed noise limits, and a schedule, subject to CPM approval, for implementing these measures.

Within 30 days of completion of installation of these measures, the project owner shall submit to the CPM a summary report of a new noise survey, performed as described above and showing compliance with this measure.

NOISE-5 Onsite Occupational Noise Exposure

Employees working near the major P3 noise-producing sources will participate in a facility-specific hearing conservation program if a program is necessary for compliance with the OSHA regulations. In addition, specific facility areas will have noise surveys conducted after commissioning to determine where noise hazard warnings and personal hearing protection is necessary. With these features in place, no special mitigation measures will be required.

- Occupational Noise Survey
  - Within 30 days of P3 first achieving a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct an occupational noise survey to verify modeled noise levels and to identify any additional noise hazard areas in the facility. The survey shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations, Sections 5095-5099 (Article 105); and Title 29, Code of Federal Regulations, Section 1910.95. The survey results shall be used to determine the magnitude of employee noise exposure. Areas above 85 dBA that may be accessed by any personnel shall be posted as high-noise-level areas. Hearing protectors shall be furnished and their use required in the posted areas.

4.7.5 Laws, Ordinances, Regulations, and Standards

P3 will be constructed and operated in accordance with all LORS applicable to noise and vibration. Federal, state, and local LORS applicable to noise and vibration are discussed below and summarized in Table 4.7-19, Applicable Laws, Ordinances, Regulations, and Standards.

4.7.5.1 Federal

A number of laws and guidelines at the federal level direct the consideration of a broad range of noise and vibration issues; these include the National Environmental Policy Act, Noise Control Act, and Federal Energy Regulatory Commission Guidelines. Because the project does not fall within the purview of the Federal Energy Regulatory Commission or require action by federal agencies, the project is not directly subject to federal noise regulations other than OSHA, as described below.

4.7.5.1.1 Occupational Safety and Health Administration

OSHA Occupational Noise Exposure; Hearing Conservation Amendment (Federal Register 48 (46), 9738 – 9785 (1983) – The standard stipulates that protection against the effects of noise exposure shall be provided for employees when sound levels exceed 90 dBA over an 8-hour exposure period. Protection shall consist of feasible administrative or engineering controls. If such controls fail to reduce sound levels to within acceptable levels, personal protective equipment shall be provided and used to reduce exposure of the employee. Additionally, a Hearing Conservation Program must be instituted by the employers whenever employee noise exposure equals or exceeds the Action Level of an 8-hour time-weighted average sound level of 85 dBA. The Hearing Conservation Program requirements consist of periodic area and personal noise monitoring, performance and evaluation of audiograms, provision of hearing protection, annual employee training, and record keeping.

P3 will comply with OSHA regulations, with measures indicated in NOISE-5 anticipated to be a CEC Condition of Certification for the Project.

4.7.5.2 State

4.7.5.2.1 California Energy Commission

The State of California provides regulation by adopted laws and guidance regarding noise emissions through the jurisdiction of state commissions. Regulation of noise emissions and noise exposure from power plants is provided via the CEC. The CEC provides siting guidelines (CEC-140-2007-003) to assist power plant operators with the evaluation of potential power plant locations. The siting guidelines specify the that potential noise impacts from power plant construction and operation be evaluated through the comparison of existing ambient noise levels, with the noise levels projected to result from the project. This approach requires the determination of noise emissions from the project and evaluation of noise exposure at specific receptor locations. In essence, this methodology ensures that power plants in California are sited with regard to the local noise environment. In general, the CEC considers that a project-related increase in environmental noise of 5 to 10 dBA or more at noise-sensitive receptors may be significant. An increase of 10 dBA or more is generally considered a significant impact.

Analysis of potential noise impacts with respect to this allowable outdoor ambient noise increment due to project construction or operation is presented in Section 4.7.2.2. As shown in Tables 4.7-14, 4.7-15 and 4.7-16, project operation (Scenario II) under all of the meteorological and time-period cases is not expected to cause future ambient L_{90} to rise more than 5 dBA; therefore, such increments would be considered insignificant effects and indicate compliance with this standard.

4.7.5.2.2 Cal/OSHA

Occupational exposure to noise is regulated by Cal/OSHA in Title 8, Group 15, Article 105, Sections 5095-5100. The standard specifies that protection against the effects of noise exposure shall be provided when sound levels exceed 90 dBA over an 8-hour exposure period. Protection shall consist of feasible administrative or engineering controls. If such controls fail to reduce sound levels to within acceptable levels, personal protective equipment shall be provided and used to reduce exposure of the employee. Additionally, a Hearing Conservation Program must be instituted by the employers whenever employee noise exposure equals or exceeds the Action Level of an 8-hour time-weighted average sound level of 85 dBA. The Hearing Conservation Program requirements consist of periodic area and personal noise monitoring, performance and evaluation of audiograms, provision of hearing protection, annual employee training, and record keeping. The CEC incorporates this regulation into its Conditions of Certification.

The project will comply with Cal/OSHA regulations, and with measures indicated in NOISE-5 anticipated to be a CEC Condition of Certification for the project.

4.7.5.3 Local

P3 is in the Coastal Zone of the City of Oxnard. Although the Coastal Land Use Plan offers no specific regulations or guidance on noise, it defines land uses types within the City's Coastal Zone and its "sphere of influence" that appears to include Ventura County jurisdictional lands immediately north of the MGS property.

4.7.5.3.1 Ventura County

The County of Ventura establishes noise compatibility guidelines in the Noise Element of the County of Ventura General Plan. These guidelines are used to evaluate the noise impacts from new projects. Noise-

sensitive land uses are defined as including "residential, educational, health facilities, research institutions, certain recreational and entertainment facilities (typically, indoor theaters and parks for passive activities) and churches."

Assessment of potential project noise impact at the nearest identified noise-sensitive receiver (LT-2) in unincorporated Ventura County is presented in Section 4.7.2.2 with respect to criteria that are established by regulations and guidance, as summarized in the following paragraphs.

Construction Noise Threshold Criteria

From its Construction Noise Threshold Criteria and Control Plan (County of Ventura, 2010), Ventura County has NTC for both daytime and evening construction activity. When construction occurs during daytime hours, NTC depends on the duration of the construction project. For a project like P3, which is expected to involve activity on the MGS site for 18 months, the NTC associated with the "longer than 8 weeks" category would apply, and are as follows:

- During the day, for hospitals and nursing homes, at the noise-sensitive receptor area or as measured 10 feet from a noise-sensitive building, the greater of 55 dBA hourly L_{eq} or the existing ambient hourly L_{eq} plus a 3-dBA increment.

- In the evening, for residential receptors, the NTC would be the greater of 50 dBA hourly L_{eq} or the existing ambient hourly L_{eq} plus 3 dBA.

- At night, for residential or live-in institutional receptors, the NTC would be the greater of 50 dBA hourly L_{eq} or the existing ambient hourly L_{eq} plus 3 dBA.

Noise Element

The following policies are contained in the County of Ventura General Plan (Section 2.16.2):

1. All discretionary development shall be reviewed for noise compatibility with surrounding uses. Noise compatibility shall be determined from a consistent set of criteria based on the standards listed below. An acoustical analysis by a qualified acoustical engineer shall be required of discretionary developments involving noise exposure or noise generation in excess of the established standards. The analysis shall provide documentation of existing and projected noise levels at on-site and off-site receptors, and shall recommend noise control measures for mitigating adverse impacts.

    (1) Noise sensitive uses proposed to be situated near highways, truck routes, heavy industrial activities and other relatively continuous noise sources shall incorporate noise control measures so that:

        a. Indoor noise levels in habitable rooms do not exceed CNEL 45.
        b. Outdoor noise levels do not exceed CNEL 60 or 1-hour L_{eq} of 65 dB(A) during any hour.

    (2) Noise sensitive uses proposed to be situated near railroads shall incorporate noise control measures so that:

        a. Guidelines (1)a. and (1)b. above are adhered to.
        b. Outdoor noise levels do not exceed L_{10} of 60 dB(A).

    (3) Noise sensitive uses proposed to be situated near airports:

        a. Shall be prohibited if they are in a CNEL 65 or greater, noise contour.

b. Shall be permitted in the CNEL 60 to CNEL 65 noise contour area only if means will be taken to ensure interior noise levels of CNEL 45 or less.

(4) Noise generators, proposed to be situated near any noise sensitive use, shall incorporate noise control measures so that ongoing outdoor noise levels received by the noise sensitive receptor, measured at the exterior wall of the building, do not exceed any of the following standards:

a. One-hour Leq of 55 dB(A) or ambient noise level plus 3 dB(A), whichever is greater, during any hour from 6:00 a.m. to 7:00 p.m.
b. One-hour Leq of 50 dB(A) or ambient noise level plus 3 dB(A), whichever is greater, during any hour from 7:00 p.m. to 10:00 p.m.
c. One-hour Leq of 45 dB(A) or ambient noise level plus 3 dB(A), whichever is greater, during any hour from 10:00 p.m. to 6:00 a.m.

Section 2.16.2(4) is not applicable to increased traffic noise along any of the roads identified within the 2020 Regional Roadway Network (Figure 4.2.3) Public Facilities Appendix of the Ventura County General Plan (see 2.16.2-1[1]). In addition, State and Federal highways, all railroad line operations, aircraft in flight, and public utility facilities are noise generators having Federal and State regulations that preempt local regulations.

(5) Construction noise shall be evaluated and, if necessary, mitigated in accordance with the County Construction Noise Threshold Criteria and Control Plan.

2. Discretionary development which would be impacted by noise, or generate project related noise which cannot be reduced to meet the standards prescribed in Policy 2.16.2-1., shall be prohibited. This policy does not apply to noise generated during the construction phase of a project.

3. The priorities for noise control shall be as follows:

(1) Reduction of noise emissions at the source.

(2) Attenuation of sound transmission along its path, using barriers, landforms modification, dense plantings, and the like.

(3) Rejection of noise at the reception point via noise control building construction, hearing protection or other means.

4.7.5.3.2 City of Oxnard

Assessment of the potential project noise impacts at the nearest identified noise-sensitive receivers (LT-1, OSW, LT-3) in the City of Oxnard is presented in Section 4.7.2.2 with respect to criteria that are established by regulations and guidance as summarized in the following paragraphs.

Noise Ordinance

Oxnard City Code (OCC) contains noise ordinance language under Article XI (Sound Regulation) of Chapter 7 (Nuisances). Sections 7-185 and 7-188 of the OCC are summarized below to illustrate the pertinent noise-level limits and exemptions that apply to the project.

OCC 7-185

(A) The following standards, unless otherwise specifically indicated, shall apply to all property in the designated sound zone:

- Sound Zone I – Residential – 55 dBA (7 a.m. to 10 p.m.); 50 dBA (10 p.m. to 7 a.m.)
- Sound Zone I – Commercial – 65 dBA (7 a.m. to 10 p.m.); 60 dBA (10 p.m. to 7 a.m.)
- Sound Zone I – Industrial – 70 dBA (7 a.m. to 10 p.m.); 70 dBA (10 p.m. to 7 a.m.)
- Sound Zone IV – As identified in Figure IX-2 of the 2020 General Plan

(B) Each of the sound levels specified shall be reduced by 5 dBA for impulse sound and simple tone noise, or for sounds consisting of speech or music, provided, however, that if the ambient sound level exceeds the allowable exterior sound level, the ambient sound level shall be the standard.

(C) No person at any location within the city shall create, maintain, cause or allow any sound on property which causes the sound level, when measured on any other property, to exceed:

(1) The allowable exterior sound level for a cumulative period of more than 30 minutes in any hour;
(2) The allowable exterior sound level plus 5 dBA for a cumulative period of more than 15 minutes in any hour;
(3) The allowable exterior sound level plus 10 dBA for a cumulative period of more than 5 minutes in any hour;
(4) The allowable exterior sound level plus 15 dBA for a cumulative period of more than 1 minute in any hour; or
(5) The allowable exterior sound level plus 20 dBA for any period of time.

(D) In the event the ambient sound level exceeds any of the first four sound level categories in subsection (C) above, the allowable exterior sound level applicable to the category shall be increased to reflect ambient sound level. In the event the ambient sound level exceeds the fifth category, the maximum allowable exterior sound level under the category shall be increased to reflect the maximum ambient sound level.

(E) If the measurement location is on a boundary between two different sound zones, the lower allowable exterior sound level applicable to the sound zone shall apply.

(F) If the intruding sound level is continuous and cannot be reasonably discontinued or stopped for a time period whereby the ambient sound level may be determined, then the measured sound level obtained while the sound source is in operation shall be compared directly to the allowable exterior sound level. The allowable exterior sound level shall be the one applicable to the type of land use at the location of the measurement and the time of day.

(G) The reasonableness of temporarily discontinuing the sound generated by an intruding sound source shall be determined by the director for the purpose of establishing the existing ambient sound level at the measurement location.

OCC 7-188

The following specified activities shall be exempted from the provisions of Article XI.

(C) Any mechanical device, apparatus or equipment used, related to or connected with emergency machinery, vehicle, work or alarm, provided the sounding of any alarm on any building or motor vehicle shall terminate within 30 minutes in any hour of being activated.

(D) Sound sources associated with or created by construction, repair, remodeling or grading of any real property or during authorized seismic surveys, provided the activities occur between the hours of 7:00 a.m. and 6:00 p.m. on weekdays, including Saturday.

(F) Sounds associated with the maintenance of real property, provided the activities occur between the hours of 7:00 a.m. and 6:00 p.m. on any day except Sunday and between the hours of 9:00 a.m. and 8:00 p.m. on Sunday. Required city services shall be allowed to conduct routine maintenance of real property or emergency-related function before 7:00 a.m. and after 6:00 p.m. on any day.

(G) Sounds associated with the maintenance and inspection of emergency machinery, vehicle, work or alarm provided the activities occur between the hours of 7:00 a.m. and 6:00 p.m., Monday through Friday.

Noise Element

The City of Oxnard establishes noise/land use compatibility guidelines in the Safety and Hazards Element of the City of Oxnard General Plan. These guidelines are used to evaluate the noise impacts from new projects. Land use categories and their corresponding maximum allowable noise exposure levels (in terms of L_{dn} or CNEL) can be found in Table 6-4 of the City of Oxnard General Plan Draft Background Report (City of Oxnard, 2006). The maximum allowable exterior noise exposure level for residential land uses is 65 dBA CNEL. The Draft Background Report also references City of Oxnard Noise Ordinance limits, already presented in previous paragraphs, as Table 6-6.

4.7.6 Involved Agencies and Agency Contacts

Agencies involved with noise-related aspects of the project are listed in Table 4.7-20.

4.7.7 Permits Required and Permit Schedule

Other than certification from the CEC, no state, federal, or local permits are required for management of noise and vibration related to the project.

4.7.8 References

AECOM, 2014. Sound measurements collected during field survey. December 15 through 18.

CEC (California Energy Commission), 2008. Riverside Energy Resource Center Units 3 and 4 Small Power Plant Exemption (08-SPPE-1) Final Initial Study/Proposed Mitigated Negative Declaration. Staff Report CEC-700-2008-010-SF. November 12.

CEC (California Energy Commission), 2012. Pio Pico Energy Center Final Staff Assessment. May.

City of Oxnard, 2006. City of Oxnard General Plan Draft Background Report. Available online at: http://developmentservices.cityofoxnard.org/7/76/961/.

County of Ventura, 2014. Traffic Volumes on Ventura County Roadways. Public Works Agency Transportation Department. Available online at: http://pwaportal.ventura.org/TD/Residents/Streets_and_Transportation/Reports_and_Programs/TF_TrafficVolumeBookletTrends.pdf.

County of Ventura, 2010. Construction Noise Threshold Criteria and Control Plan. Available online at: http://www.ventura.org/rma/planning/pdf/ceqa/Construction_Noise_Thresholds.pdf.

General Electric, 2004. NoiseApp3.xls, Octaves, dated April 27, 2004. Available online at: http://www.energy.ca.gov/sitingcases/riverside/documents/applicants_files/SPPE_application/Appendix%206.7%20B%20Noise.pdf. Last accessed February 24, 2015.

ISO (International Organization of Standardization), 1996. Acoustics-Attenuation of sound during propagation outdoors – Part 2: general method of calculation, 9613-2:1996(E). Geneva, Switzerland.

SCE (Southern California Edison), 2013. 2015 General Rate Case – Generation Volume 9 –Peakers. Available online at: http://www3.sce.com/sscc/law/dis/dbattach5e.nsf/0/8767C07C6A42209888257C210080EBE3/$FILE/SCE-02%20Vol.%2009.pdf. Last accessed February 24, 2015.

State of California, 2003. General Plan Guidelines. Prepared by Governor's Office of Planning and Research. October.

U.S. Department of Transportation, 2006a. Transit Noise and Vibration Impact Assessment. FTA-VA-90-1003-06.

U.S. Department of Transportation, 2006b. "FHWA Roadway Construction Noise Model User's Guide." Federal Highway Administration. FHWA-HEP-05-054.

Weather Underground, 2015. Available online at: http://www.wunderground.com/weather-forecast/US/CA/Oxnard.html.

Table 4.7-1
Short-Term SPL Measurement Summary

Location ID	Date (mm/dd/yy)	Start Time (hh:mm)	Duration (minutes)	A-weighted SPL					
				L_{eq}	L_{max}	L_{min}	L_{10}	L_{50}	L_{90}
LT-1	12/15/14	21:20	40	57	77	44	57	51	49
	12/15/14	22:00	15	53	72	44	53	49	46
	12/16/14	15:10	15	59	75	41	64	51	44
	12/16/14	21:55	5	57	70	45	60	52	48
	12/16/14	22:00	15	55	75	43	55	49	45
	12/17/14	13:29	15	59	71	49	56	55	55
	12/17/14	17:17	15	59	71	50	56	56	55
	12/17/14	20:30	15	57	68	49	54	54	54
	12/17/14	22:24	15	58	70	47	54	54	54
	12/18/14	11:37	15	61	77	47	57	56	56
LT-2	12/15/14	21:34	26	50	67	40	50	46	44
	12/15/14	22:00	15	47	66	40	47	44	43
	12/16/14	16:00	15	60	72	48	63	54	50
	12/16/14	21:50	10	48	66	39	48	42	40
	12/16/14	22:00	15	49	67	39	48	42	41
	12/17/14	14:19	15	58	73	50	56	56	55
	12/17/14	18:03	15	57	74	46	55	54	54
	12/17/14	21:32	28	51	67	45	50	50	49
	12/17/14	22:00	15	51	64	45	50	49	49
LT-3	12/15/14	21:15	45	62	80	43	66	57	51
	12/15/14	22:00	15	58	70	42	61	50	45
	12/16/14	15:35	15	68	78	48	70	67	60
	12/16/14	21:50	10	60	71	42	65	53	46
	12/16/14	22:00	15	59	70	43	62	52	46
	12/17/14	13:53	15	66	73	53	65	64	64
	12/17/14	17:39	15	66	76	52	65	65	64
	12/17/14	20:52	15	63	70	50	61	60	60
	12/17/14	22:49	15	59	73	44	53	53	52
	12/18/14	11:58	15	62	75	40	59	58	57
Near Oxnard Shores West	12/16/14	22:30	10	52	58	49	53	51	50
	12/16/14	22:45	10	52	62	49	53	51	50
At Beach Crest	12/16/14	22:30	10	68	78	62	72	66	63
	12/16/14	22:45	10	68	74	60	72	65	63

Notes:

dd = day
hh:mm = hour:minute
ID = Identification
L_{10} = the noise levels equaled or exceeded during 10 percent of the measured time interval
L_{50} = the noise levels equaled or exceeded during 50 percent of the measured time interval
L_{90} = the noise levels equaled or exceeded during 90 percent of the measured time interval
L_{eq} = equivalent sound level
L_{max} = maximum sound level
L_{min} = minimum sound level
mm = month
SPL = Sound Pressure Level
yy = year

Table 4.7-2
Oxnard Shores Long-Term (LT-1) SPL Measurement Summary

Date (mm/dd/yy)	Start Time (hh:mm)	Hourly A-weighted SPL					
		L_{eq}	L_{max}	L_{min}	L_{10}	L_{50}	L_{90}
12/15/14	15:25	57	78	45	59	52	49
12/15/14	16:25	54	72	45	57	50	48
12/15/14	17:25	53	72	43	56	49	46
12/15/14	18:25	53	74	41	54	47	44
12/15/14	19:25	54	70	42	57	49	47
12/15/14	20:25	53	69	45	54	50	48
12/15/14	21:25	51	68	43	52	48	46
12/15/14	22:25	50	71	43	52	47	45
12/15/14	23:25	49	66	41	49	46	44
12/16/14	00:25	47	67	41	47	45	43
12/16/14	01:25	46	65	42	46	45	43
12/16/14	02:25	45	56	42	46	44	43
12/16/14	03:25	47	65	41	48	46	44
12/16/14	04:25	49	67	43	51	48	46
12/16/14	05:25	53	74	44	54	51	49
12/16/14	06:25	57	75	49	59	54	52
12/16/14	07:25	58	69	49	61	55	53
12/16/14	08:25	56	72	47	60	53	50
12/16/14	09:25	57	73	45	60	52	49
12/16/14	10:25	58	79	45	61	52	48
12/16/14	11:25	56	74	45	59	51	48
12/16/14	12:25	56	79	42	58	50	46
12/16/14	13:25	54	70	42	57	49	45
12/16/14	14:25	54	73	40	57	47	43
12/16/14	15:25	56	77	41	58	49	45
12/16/14	16:25	55	73	44	59	52	48
12/16/14	17:25	54	73	44	56	49	47
12/16/14	18:25	53	72	44	55	48	46
12/16/14	19:25	52	68	44	54	49	47
12/16/14	20:25	53	71	43	55	51	48

Table 4.7-2
Oxnard Shores Long-Term (LT-1) SPL Measurement Summary (Continued)

Date (mm/dd/yy)	Start Time (hh:mm)	Hourly A-weighted SPL					
		L_{eq}	L_{max}	L_{min}	L_{10}	L_{50}	L_{90}
12/16/14	21:25	51	71	42	52	47	45
12/16/14	22:25	48	64	40	50	46	43
12/16/14	23:25	47	63	40	49	45	42
12/17/14	00:25	51	72	41	52	48	45
12/17/14	01:25	54	78	41	53	49	47
12/17/14	02:25	49	64	44	50	49	47
12/17/14	03:25	49	64	44	50	48	46
12/17/14	04:25	53	67	46	54	51	49
12/17/14	05:25	57	78	50	59	56	53
12/17/14	06:25	60	76	51	62	58	56
12/17/14	07:25	58	69	49	61	56	53
12/17/14	08:25 through 10:25	SLM was offline (power loss)					
12/17/14	11:25	54	75	40	58	48	43
12/17/14	12:25	58	75	42	60	55	50
12/17/14	13:25	60	82	50	61	58	55
12/17/14	14:25	60	73	52	63	60	57
12/17/14	15:25	60	74	52	62	60	57
12/17/14	16:25	60	70	51	62	60	57
12/17/14	17:25	59	73	50	61	58	54
12/17/14	18:25	59	69	50	61	59	55
12/17/14	19:25	55	67	48	57	54	51
12/17/14	20:25	53	70	47	55	51	49
12/17/14	21:25	54	64	48	56	53	51
12/17/14	22:25	54	81	47	55	51	49
12/17/14	23:25	53	74	47	54	51	49
12/18/14	00:25	51	67	46	52	50	48
12/18/14	01:25	49	66	45	50	48	47
12/18/14	02:25	48	67	44	49	47	46
12/18/14	03:25	48	62	45	49	48	46
12/18/14	04:25	50	64	45	52	49	47

Table 4.7-2
Oxnard Shores Long-Term (LT-1) SPL Measurement Summary (Continued)

Date (mm/dd/yy)	Start Time (hh:mm)	Hourly A-weighted SPL					
		L_{eq}	L_{max}	L_{min}	L_{10}	L_{50}	L_{90}
12/18/14	05:25	55	76	47	56	52	50
12/18/14	06:25	58	76	48	60	54	52
12/18/14	07:25	56	74	46	60	54	52
12/18/14	08:25	57	80	47	59	53	51
12/18/14	09:25	56	70	46	59	53	49
12/18/14	10:25	55	71	45	58	51	48
12/18/14	11:25	56	75	42	59	52	48
12/18/14	12:25	55	70	41	58	51	46
12/18/14	13:25	54	68	40	57	49	45
12/18/14	14:25	60	85	41	59	49	44

Notes:

dd = day
hh:mm = hour:minute
ID = Identification
L_{10} = the noise levels equaled or exceeded during 10 percent of the measured time interval
L_{50} = the noise levels equaled or exceeded during 50 percent of the measured time interval
L_{90} = the noise levels equaled or exceeded during 90 percent of the measured time interval
L_{eq} = equivalent sound level
L_{max} = maximum sound level
L_{min} = minimum sound level
LT = Long-term
mm = month
SLM = Sound Level Meter
SPL = Sound Pressure Level
yy = year

Table 4.7-3
North Shore at Mandalay Bay Long-Term (LT-3) SPL Measurement Summary

Date (mm/dd/yy)	Start Time (hh:mm)	Hourly A-weighted SPL					
		L_{eq}	L_{max}	L_{min}	L_{10}	L_{50}	L_{90}
12/15/14	16:25	66	79	49	69	65	60
12/15/14	17:25	65	75	47	68	64	55
12/15/14	18:25	64	76	46	67	62	52
12/15/14	19:25	63	77	47	67	59	51
12/15/14	20:25	63	72	46	67	59	50
12/15/14	21:25	61	79	43	66	55	48
12/15/14	22:25	60	77	45	65	50	47
12/15/14	23:25	57	73	42	61	48	46
12/16/14	00:25	56	71	41	59	45	43
12/16/14	01:25	53	70	41	53	44	42
12/16/14	02:25	52	73	40	51	43	41
12/16/14	03:25	55	75	40	56	45	43
12/16/14	04:25	59	75	42	64	51	44
12/16/14	05:25	64	74	42	67	61	51
12/16/14	06:25	66	79	49	69	65	56
12/16/14	07:25	67	75	49	70	66	58
12/16/14	08:25	65	77	44	68	63	52
12/16/14	09:25	63	82	44	67	61	50
12/16/14	10:25	64	88	42	67	60	49
12/16/14	11:25	63	74	43	67	62	49
12/16/14	12:25	64	75	42	68	62	49
12/16/14	13:25	65	81	44	68	63	50
12/16/14	14:25	66	75	47	70	66	55
12/16/14	15:25	67	77	44	70	67	57
12/16/14	16:25	68	78	51	70	68	62
12/16/14	17:25	67	80	52	70	67	60
12/16/14	18:25	65	77	52	68	64	57
12/16/14	19:25	64	72	50	68	62	54
12/16/14	20:25	62	72	44	66	58	49
12/16/14	21:25	60	72	42	64	53	46

Table 4.7-3
North Shore at Mandalay Bay Long-Term (LT-3) SPL Measurement Summary (Continued)

Date (mm/dd/yy)	Start Time (hh:mm)	Hourly A-weighted SPL					
		L_{eq}	L_{max}	L_{min}	L_{10}	L_{50}	L_{90}
12/16/14	22:25	59	77	41	63	49	44
12/16/14	23:25	56	75	40	61	46	42
12/17/14	00:25	56	71	41	58	47	44
12/17/14	01:25	57	76	37	58	47	45
12/17/14	02:25	57	79	42	57	48	47
12/17/14	03:25	56	74	42	59	48	46
12/17/14	04:25	62	77	48	66	55	51
12/17/14	05:25 through 09:25	SLM was offline (power loss)					
12/17/14	10:25	68	91	42	69	63	50
12/17/14	11:25	65	76	44	69	64	53
12/17/14	12:25	67	78	50	70	66	58
12/17/14	13:25	67	77	51	70	66	59
12/17/14	14:25	68	81	55	71	67	61
12/17/14	15:25	69	79	57	71	69	63
12/17/14	16:25	68	80	53	71	68	63
12/17/14	17:25	67	77	52	70	66	60
12/17/14	18:25	65	76	53	69	64	57
12/17/14	19:25	65	76	51	69	63	56
12/17/14	20:25	64	78	50	68	61	54
12/17/14	21:25	62	73	46	66	59	52
12/17/14	22:25	62	91	44	64	54	47
12/17/14	23:25	59	71	44	64	52	47
12/18/14	00:25	56	70	44	59	48	45
12/18/14	01:25	56	74	42	58	46	44
12/18/14	02:25	52	71	42	53	45	43
12/18/14	03:25	55	71	42	58	46	44
12/18/14	04:25	59	76	44	63	52	47
12/18/14	05:25	64	75	47	67	61	52
12/18/14	06:25	66	82	48	69	64	56

Table 4.7-3
North Shore at Mandalay Bay Long-Term (LT-3) SPL Measurement Summary (Continued)

Date (mm/dd/yy)	Start Time (hh:mm)	Hourly A-weighted SPL					
		L_{eq}	L_{max}	L_{min}	L_{10}	L_{50}	L_{90}
12/18/14	07:25	66	76	48	69	65	57
12/18/14	08:25	65	76	46	68	64	54
12/18/14	09:25	64	80	46	67	62	53
12/18/14	10:25	63	75	43	67	61	50
12/18/14	11:25	64	78	41	67	62	49
12/18/14	12:25	63	75	39	67	61	47
12/18/14	13:25	63	74	39	67	61	47
12/18/14	14:25	66	81	44	69	64	52

Notes:
dd = day
hh:mm = hour:minute
ID = Identification
L_{10} = the noise levels equaled or exceeded during 10 percent of the measured time interval
L_{50} = the noise levels equaled or exceeded during 50 percent of the measured time interval
L_{90} = the noise levels equaled or exceeded during 90 percent of the measured time interval
L_{eq} = equivalent sound level
L_{max} = maximum sound level
L_{min} = minimum sound level
LT = Long-term
mm = month
SLM = Sound Level Meter
SPL = Sound Pressure Level
yy = year

Table 4.7-4
Hourly SPL During MGS Unit 1, 2, or 3 Operation

Monitor Location	Date (mm/dd/yy)	Start Time (hh:mm)	Hourly A-weighted SPL					
			L_{eq}	L_{max}	L_{min}	L_{10}	L_{50}	L_{90}
LT-1 [1]	12/16/14	9:25	57	73	45	60	52	49
LT-3 [1]	12/16/14	9:25	63	82	44	67	61	50
LT-1 [2,3]	12/16/14	17:25	54	73	44	56	49	47
LT-3 [2,3]	12/16/14	17:25	67	80	52	70	67	60
LT-1 [4,5]	12/17/14	18:25	59	69	50	61	59	55
LT-3 [4,5]	12/17/14	18:25	65	76	53	69	64	57

Notes:

[1] On December 16, 2014, Unit 3 operation load peaked (full) at 9:45 a.m.
[2] On December 16, 2014, Unit 1 operation load peaked at 185 MW at 5:30 p.m.
[3] On December 16, 2014, Unit 2 operation load peaked at 151 MW at 5:45 p.m.
[4] On December 16, 2014, Unit 1 operation load peaked at 124 MW at 7:10 p.m.
[5] On December 16, 2014, Unit 2 operation load peaked at 80 MW at 6:40 p.m.

dd = day
hh:mm = hour:minute
ID = Identification
L_{10} = the noise levels equaled or exceeded during 10 percent of the measured time interval
L_{50} = the noise levels equaled or exceeded during 50 percent of the measured time interval
L_{90} = the noise levels equaled or exceeded during 90 percent of the measured time interval
L_{eq} = equivalent sound level
L_{max} = maximum sound level
L_{min} = minimum sound level
MGS = Mandalay Generating Station
mm = month
MW = megawatt
SPL = Sound Pressure Level
yy = year

Table 4.7-5
Comparison of ST Measurement Data Near Oxnard Shores

Approximate Measured Time Period (hh:mm) on 12/16/2014	L_{eq} (dBA)					L_{90} (dBA)				
	Beach Crest	OSW	LT-1	BC-OSW	OSW-LT-1	Beach Crest	OSW	LT-1	BC-OSW	OSW-LT-1
22:30 – 22:40	68	52	48	16	4	63	50	45	17	5
22:45 – 22:55	68	52	49	16	4	63	50	43	17	5
Predicted Drop-off[1]				16	3			60	16	3

Notes:

[1] Assuming surf dominant source in ambient outdoor sound environment.

BC = Beach Crest
dBA = A-Weighted equivalent decibel
L_{90} = the noise levels equaled or exceeded during 90 percent of the measured time interval
L_{eq} = equivalent sound level
OSW = Oxnard Shores West (atop dune at intersection of West 5th Street and Mandalay Beach Road
ST = Short-Term

Table 4.7-6
Construction and Demolition Activity Noise Estimates at Nearby Noise-Sensitive Receivers

Receiver Location	Construction		Demolition		Combined	
	Low L_{eq} (dBA, 18th month)	High L_{eq} (dBA, 4th month)	Low L_{eq} (dBA, 10th month)	High L_{eq} (dBA, 4th month)	Low L_{eq} (dBA, 18th month)	High L_{eq} (dBA, 4th month)
LT-2	33	44	39	43	33	47
LT-3	38	50	44	49	38	52
LT-1	33	44	39	43	33	47
Oxnard Shores West	33	45	39	44	33	47

Notes:

Does not include pile-driving noise. If added, pile-driving noise would increase Combined Low L_{eq} by 9 dBA and Combined High L_{eq} by 2 dBA.

L_{eq} = equivalent sound level
dBA = A-Weighted equivalent decibel
MGS = Mandalay Generating Station

Table 4.7-7
Combined Construction Noise Impact Assessment – High Estimate

Receiver ID	Time of Day	Representative Ambient SPL (dBA)[1]			High Estimate of Noise (dBA)	City of Oxnard or Ventura County Criteria			Oxnard or Ventura County Impact?	CEC Impact? (High Est. > L_{90}+10 dBA)
		L_{eq}	L_{50}	L_{90}		Day	Eve	Night		
LT-2	Day[2]	60	54	50	47	n/a	Greater of 50 dBA L_{eq} or ambient +3 dBA	Greater of 45 dBA L_{eq} or ambient +3 dBA	no	no
	Eve	48	42	40	47				no	no
	Night	49	42	41	47				no	no
LT-3	Day[3]	63	61	47	52	Greater of 55 dBA L_{50} or ambient L_{50}		Greater of 50 dBA L_{50} or ambient L_{50}	no	no
	Day[4]	67	67	60	52				no	no
	Day[5]	65	64	57	52				no	no
	Day[6]	63	61	50	52				no	no
	Eve[7]	61	55	46	52				no	no
	Night[8]	54	44	42	52				yes	no
LT-1	Day[3]	55	51	46	47	Greater of 55 dBA L_{50} or ambient L_{50}		Greater of 50 dBA L_{50} or ambient L_{50}	no	no
	Day[4]	54	49	47	47				no	no
	Day[5]	59	59	55	47				no	no
	Day[6]	57	52	49	47				no	no
	Eve[7]	52	48	46	47				no	no
	Night[8]	46	45	43	47				no	no
OSW	Night	52	51	50	47	Same as LT-1			no	no

Notes:

1 Unless otherwise noted, values for LT-2 and OSW are based on partial-hour ST measurements (see Table 4.7-1), and values for LT-1 and LT-3 are full hours and based on LT measurement data (see Tables 4.7-2 and 4.7-3).
2 With MGS Units 1 and 2 operating.
3 With no MGS units operating during the 12:25 p.m. to 1:25 p.m. hour on December 18, 2014, from Table 4.7-2.
4 With MGS Units 1 and 2 operating at peak on December 16, 2014, from Table 4.7-4.
5 With MGS Units 1 and 2 operating at peak on December 17, 2014, from Table 4.7-4.
6 With MGS Unit 3 operating at peak on December 16, 2014, from Table 4.7-4.
7 With no MGS units operating, 9:00 p.m. to 10:00 p.m. on December 16, 2014.
8 L_{eq} is an energy average of 4 quietest consecutive hours from survey (December 16, 2014, 00:25 to 04:25 a.m.); L_{50} and L_{90} are averages from same 4 hours.

Does not include pile-driving noise.

CEC = California Energy Commission
dBA = A-Weighted equivalent decibel
ID = Identification
L_{50} = the noise levels equaled or exceeded during 50 percent of the measured time interval
L_{90} = the noise levels equaled or exceeded during 90 percent of the measured time interval
L_{eq} = equivalent sound level
LT = Long-Term
MGS = Mandalay Generating Station
n/a = not applicable
OSW = Oxnard Shores West
SPL = Sound Pressure Level
ST = Short-Term

Table 4.7-8
Combined Construction Noise Impact Assessment – Low Estimate

Receiver ID	Time of Day	Representative Ambient SPL (dBA)[1]			Low Estimate of Noise (dBA)	City of Oxnard or Ventura County Criteria			Oxnard or Ventura County Impact?	CEC Impact? (High Est. > L_{90}+10 dBA)
		L_{eq}	L_{50}	L_{90}		Day	Eve	Night		
LT-2	Day[2]	60	54	50	33	n/a	Greater of 50 dBA L_{eq} or ambient +3 dBA	Greater of 45 dBA L_{eq} or ambient +3 dBA	no	no
	Eve	48	42	40	33				no	no
	Night	49	42	41	33				no	no
LT-3	Day[3]	63	61	47	38	Greater of 55 dBA L_{50} or ambient L_{50}		Greater of 50 dBA L_{50} or ambient L_{50}	no	no
	Day[4]	67	67	60	38				no	no
	Day[5]	65	64	57	38				no	no
	Day[6]	63	61	50	38				no	no
	Eve[7]	61	55	46	38				no	no
	Night[8]	54	44	42	38				no	no
LT-1	Day[3]	55	51	46	33	Greater of 55 dBA L_{50} or ambient L_{50}		Greater of 50 dBA L_{50} or ambient L_{50}	no	no
	Day[4]	54	49	47	33				no	no
	Day[5]	59	59	55	33				no	no
	Day[6]	57	52	49	33				no	no
	Eve[7]	52	48	46	33				no	no
	Night[8]	46	45	43	33				no	no
OSW	Night	52	51	50	33	Same as LT-1			no	no

Notes:

[1] Unless otherwise noted, values for LT-2 and OSW are based on partial-hour ST measurements (see Table 4.7-1), and values for LT-1 and LT-3 are full hours and based on LT measurement data (see Tables 4.7-2 and 4.7-3).
[2] With MGS Units 1 and 2 operating.
[3] With no MGS units operating during the 12:25 p.m. to 1:25 p.m. hour on December 18, 2014, from Table 4.7-2.
[4] With MGS Units 1 and 2 operating at peak on December 16, 2014, from Table 4.7-4.
[5] With MGS Units 1 and 2 operating at peak on December 17, 2014, from Table 4.7-4.
[6] With MGS Unit 3 operating at peak on December 16, 2014, from Table 4.7-4.
[7] With no MGS units operating, 9:00 p.m. to 10:00 p.m. on December 16, 2014.
[8] L_{eq} is an energy average of four quietest consecutive hours from survey (December 16, 2014, 00:25 to 04:25 a.m.); L_{50} and L_{90} are averages from same 4 hours.

Does not include pile-driving noise.

CEC = California Energy Commission
dBA = A-Weighted equivalent decibel
ID = Identification
L_{50} = the noise levels equaled or exceeded during 50 percent of the measured time interval
L_{90} = the noise levels equaled or exceeded during 90 percent of the measured time interval
L_{eq} = equivalent sound level
LT = Long-Term
MGS = Mandalay Generating Station
n/a = not applicable
OSW = Oxnard Shores West
SPL = Sound Pressure Level
ST = Short-Term

Table 4.7-9
Reference Sound Power Levels of Major Noise-Producing P3 System Components

P3 System Component or Feature	Overall L_w (dBA)	Data Source or Reference
Air compressor skid	93	Pio Pico AFC (Table 5.12-17)
Ammonia system	101	Pio Pico AFC (Table 5.12-17)
Closed cooling water – pump A and B (each)	93	see Note 1 below
Cooling fan module	105	see Note 2 below
Dilution/tempering air fan A and B (each)	95	Pio Pico AFC (Table 5.12-17)
Evaporative cooler pump	93	see Note 1 below
Existing MGS Unit 3, "start-up"	113	see Note 3 below
Existing MGS Unit 3, "steady-state"	115	see Note 3 below
Fuel gas compressor skid (enclosure)	99	Pio Pico AFC (Table 5.12-17)
Fuel gas metering skid	98	Pio Pico AFC (Table 5.12-17)
Fuel gas piping	96	NRG
GT enclosure air discharge vents	83	NRG
GT enclosure air inlet vents	85	NRG
GT enclosure walls	80	NRG
GT exhaust diffuser	107	NRG
GT generator	106	NRG
GT GSU transformer	107	NRG
GT inlet filter house and ducting	105	NRG
GT load compartment	97	NRG
GT turbine compartment	111	NRG
Hot SCR	109	see Note 4 below
Inlet plenum	104	NRG
Lube oil module	105	NRG
UA Transformer	107	see Note 5 below

Notes:

[1] Assumed to have same PWL as "Service Water Pump" from Pio Pico AFC Table 5.12-17.
[2] Based on SPL at 400 feet.
[3] For each of four modeled sources, calculated from onsite SPL measurement data.
[4] Uses octave-band spectrum of "Stack Exit" from NRG-supplied confidential data, with +4 dB added to each band so that overall dBA is 109.
[5] Assumed to have same PWL as GSU transformer.

AFC = Application for Certification
dB = decibel
dBA = A-Weighted equivalent decibel
GSU = generator step-up
GT = gas turbine
L_{eq} = equivalent sound level
L_w = Sound Power Level
MGS = Mandalay Generating Station
P3 = Puente Power Plant
PWL = Sound Power Level
SPL = Sound Pressure Level

Sources: CEC, (2012); NRG (confidential unpublished data); AECOM (2014).

Table 4.7-10
Predicted Operations Noise at Sensitive Receptors

Scenario	Wind Case	Hourly A-weighted Sound Pressure Level (SPL)			
		LT-2	LT-3	OSW	LT-1
P3 Offline and MGS Unit 3 Online; MGS Units 1 and 2 Offline (Retired)	Calm (0 mph)	32	53	48	47
	East (7 mph)	32	50	45	45
	West (6 mph)	32	56	51	51
P3 Online and MGS Unit 3 Offline; MGS Units 1 and 2 Offline (Retired)	Calm (0 mph)	36	42	35	36
	East (7 mph)	34	39	32	33
	West (6 mph)	40	46	40	41

Notes:

MGS = Mandalay Generating Station
mph = miles per hour
OSW = Oxnard Shores West
P3 = Puente Power Plant
SPL = Sound Pressure Level

Table 4.7-11a
P3 Operation Noise Impact Assessment (Calm Conditions, MGS Unit 3 Offline)

Rcvr. ID	Time of Day	Representative Ambient SPL (dBA)[1]			City of Oxnard or Ventura County Criteria (Day, Evening, Night)			Estimated Noise Level (dBA), under Calm Conditions (wind speed = 0 mph)	Per Scenario: City of Oxnard or Ventura County Impact? (Y/N)	Per Scenario, CEC Impact, if Estimated > L_{90}+10 dBA? (Y/N)
		L_{eq}	L_{50}	L_{90}	Day	Eve	Night			
LT-2	Day[2]	60	54	50	55 dBA L_{eq} or amb. +3 dBA	50 dBA L_{eq} or amb. +3 dBA	45 dBA L_{eq} or amb. +3 dBA	36	N	N
	Eve	48	42	40				36	N	N
	Night	49	42	41				36	N	N
LT-3	Day[3]	63	61	47	55 dBA L_{50} or amb.		50 dBA L_{50} or amb.	42	N	N
	Day[4]	67	67	60				42	N	N
	Day[5]	65	64	57				42	N	N
	Eve[7]	61	55	46				42	N	N
	Night[8]	54	44	42				42	N	N
LT-1	Day[3]	55	51	46	55 dBA L_{50} or amb.		50 dBA L_{50} or amb.	36	N	N
	Day[4]	54	49	47				36	N	N
	Day[5]	59	59	55				36	N	N
	Eve[7]	52	48	46				36	N	N
	Night[8]	46	45	43				36	N	N
OSW	Night	52	51	50	55 dBA L_{50} or amb.		50 dBA L_{50} or amb.	35	N	N

Notes:

[1] Unless otherwise noted, values for LT-2 and OSW are based on partial-hour ST measurements (see Table 4.7-1), and values for LT-1 and LT-3 are full hours and based on LT measurement data (see Tables 4.7-2 and 4.7-3).

[2] With MGS Units 1 and 2 operating.

[3] With no MGS units operating during the 12:25 p.m. to 1:25 p.m. hour on December 18, 2014, from Table 4.7-2.

[4] With MGS Units 1 and 2 operating at peak on December 16, 2014, from Table 4.7-4.

[5] With MGS Units 1 and 2 operating at peak on December 17, 2014, from Table 4.7-4.

[7] With no MGS units operating, 9:00 p.m. to 10:00 p.m. on December 16, 2014.

[8] L_{eq} is an energy average of four quietest consecutive hours from survey (December 16, 2014, 00:25 to 04:25 a.m.); L_{50} and L_{90} are averages of these statistical values from each of the same 4 hours.

CEC = California Energy Commission
dBA = A-Weighted equivalent decibel
ID = Identification
L_{50} = the noise levels equaled or exceeded during 50 percent of the measured time interval
L_{90} = the noise levels equaled or exceeded during 90 percent of the measured time interval
L_{eq} = equivalent sound level
LT = Long-term
MGS = Mandalay Generating Station
mph = miles per hour
OSW = Oxnard Shores West
P3 = Puente Power Plant
SPL = Sound Pressure Level
ST = Short-Term

Table 4.7-11b
P3 Operation Noise Impact Assessment (Calm Conditions, MGS Unit 3 Online)

Rcvr. ID	Time of Day	Representative Ambient SPL (dBA)[1]			City of Oxnard or Ventura County Criteria (Day, Evening, Night)			Estimated Noise Level (dBA), under Calm Conditions (wind speed = 0 mph)	Per Scenario: City of Oxnard or Ventura County Impact? (Y/N)	Per Scenario, CEC Impact, if Estimated > L_{90}+10 dBA? (Y/N)
		L_{eq}	L_{50}	L_{90}	Day	Eve	Night			
LT-2	Day[2]	60	54	50	55 dBA L_{eq} or amb. +3 dBA	50 dBA L_{eq} or amb. +3 dBA	45 dBA L_{eq} or amb. +3 dBA	36	N	N
	Eve	48	42	41				36	N	N
	Night	49	42	42				36	N	N
LT-3	Day[3]	63	62	54	55 dBA L_{50} or amb.		50 dBA L_{50} or amb.	42	N	N
	Day[4]	67	67	61				42	N	N
	Day[5]	65	64	58				42	N	N
	Day[6]	63	61	50				42	N	N
	Eve[7]	62	57	54				42	N	N
	Night[8]	57	54	53				42	N	N
LT-1	Day[3]	56	52	50	55 dBA L_{50} or amb.		50 dBA L_{50} or amb.	36	N	N
	Day[4]	55	51	50				36	N	N
	Day[5]	59	59	56				36	N	N
	Day[6]	57	52	49				36	N	N
	Eve[7]	53	51	50				36	N	N
	Night[8]	50	49	48				36	N	N
OSW	Night	53	53	52	55 dBA L_{50} or amb.		50 dBA L_{50} or amb.	35	N	N

Notes:

1 These values represent the logarithmic addition of ambient SPL from Table 4.7-11a and predicted MGS Unit 3 operation from Table 4.7-10.
2 With MGS Units 1 and 2 operating.
3 With no MGS units operating during the 12:25 p.m. to 1:25 p.m. hour on December 18, 2014, from Table 4.7-2.
4 With MGS Units 1 and 2 operating at peak on December 16, 2014, from Table 4.7-4.
5 With MGS Units 1 and 2 operating at peak on December 17, 2014, from Table 4.7-4.
6 With MGS Unit 3 operating at peak on December 16, 2014, from Table 4.7-4, MGS Unit 1 & 2 not operational. Predicted MGS Unit 3 operation not added to these values.
7 With no MGS units operating, 9:00 p.m. to 10:00 p.m. on December 16, 2014.
8 L_{eq} is an energy average of four quietest consecutive hours from survey (December 16, 2014, 00:25 to 04:25 a.m.); L_{50} and L_{90} are averages of these statistical values from each of the same 4 hours.

CEC = California Energy Commission
dBA = A-Weighted equivalent decibel
ID = Identification
L_{50} = the noise levels equaled or exceeded during 50 percent of the measured time interval
L_{90} = the noise levels equaled or exceeded during 90 percent of the measured time interval
L_{eq} = equivalent sound level
LT = Long-term
MGS = Mandalay Generating Station
mph = miles per hour
OSW = Oxnard Shores West
P3 = Puente Power Plant
SPL = Sound Pressure Level
ST = Short-Term

Table 4.7-12a
P3 Operation Noise Impact Assessment (East Winds Conditions, MGS Unit 3 Offline)

Rcvr. ID	Time of Day	Representative Ambient SPL (dBA)[1]			City of Oxnard or Ventura County Criteria (Day, Evening, Night)			Estimated Noise Level (dBA), under East Winds Conditions (wind speed = 7 mph)	Per Scenario: City of Oxnard or Ventura County Impact? (Y/N)	Per Scenario, CEC Impact, if Estimated > L_{90}+10 dBA? (Y/N)
		L_{eq}	L_{50}	L_{90}	Day	Eve	Night			
LT-2	Day[2]	60	54	50	55 dBA L_{eq} or amb. +3 dBA	50 dBA L_{eq} or amb. +3 dBA	45 dBA L_{eq} or amb. +3 dBA	34	N	N
	Eve	48	42	40				34	N	N
	Night	49	42	41				34	N	N
LT-3	Day[3]	63	61	47	55 dBA L_{50} or amb.		50 dBA L_{50} or amb.	39	N	N
	Day[4]	67	67	60				39	N	N
	Day[5]	65	64	57				39	N	N
	Eve[7]	61	55	46				39	N	N
	Night[8]	54	44	42				39	N	N
LT-1	Day[3]	55	51	46	55 dBA L_{50} or amb.		50 dBA L_{50} or amb.	33	N	N
	Day[4]	54	49	47				33	N	N
	Day[5]	59	59	55				33	N	N
	Eve[7]	52	48	46				33	N	N
	Night[8]	46	45	43				33	N	N
OSW	Night	52	51	50	55 dBA L_{50} or amb.		50 dBA L_{50} or amb.	32	N	N

Notes:

[1] Unless otherwise noted, values for LT-2 and OSW are based on partial-hour ST measurements (see Table 4.7-1), and values for LT-1 and LT-3 are full hours and based on LT measurement data (see Tables 4.7-2 and 4.7-3).

[2] With MGS Units 1 and 2 operating.

[3] With no MGS units operating during the 12:25 p.m. to 1:25 p.m. hour on December 18, 2014, from Table 4.7-2.

[4] With MGS Units 1 and 2 operating at peak on December 16, 2014, from Table 4.7-4.

[5] With MGS Units 1 and 2 operating at peak on December 17, 2014, from Table 4.7-4.

[7] With no MGS units operating, 9:00 p.m. to 10:00 p.m. on December 16, 2014.

[8] L_{eq} is an energy average of four quietest consecutive hours from survey (December 16, 2014, 00:25 to 04:25 a.m.); L_{50} and L_{90} are averages of these statistical values from each of the same 4 hours.

CEC = California Energy Commission
dBA = A-Weighted equivalent decibel
ID = Identification
L_{50} = the noise levels equaled or exceeded during 50 percent of the measured time interval
L_{90} = the noise levels equaled or exceeded during 90 percent of the measured time interval
L_{eq} = equivalent sound level
LT = Long-term
MGS = Mandalay Generating Station
mph = miles per hour

OSW = Oxnard Shores West
P3 = Puente Power Plant
SPL = Sound Pressure Level
ST = Short-Term

Table 4.7-12b
P3 Operation Noise Impact Assessment (East Winds Conditions, MGS Unit 3 Online)

Rcvr. ID	Time of Day	Representative Ambient SPL (dBA)[1]			City of Oxnard or Ventura County Criteria (Day, Evening, Night)			Estimated Noise Level (dBA), under East winds Conditions (wind speed = 7 mph)	Per Scenario: City of Oxnard or Ventura County Impact? (Y/N)	Per Scenario, CEC Impact, if Estimated > L_{90}+10 dBA? (Y/N)
		L_{eq}	L_{50}	L_{90}	Day	Eve	Night			
LT-2	Day[2]	60	54	50	55 dBA L_{eq} or amb. +3 dBA	50 dBA L_{eq} or amb. +3 dBA	45 dBA L_{eq} or amb. +3 dBA	34	N	N
	Eve	48	42	41				34	N	N
	Night	49	42	42				34	N	N
LT-3	Day[3]	63	61	52	55 dBA L_{50} or amb.		50 dBA L_{50} or amb.	39	N	N
	Day[4]	67	67	60				39	N	N
	Day[5]	65	64	58				39	N	N
	Day[6]	63	61	50				39	N	N
	Eve[7]	61	56	51				39	N	N
	Night[8]	55	51	51				39	N	N
LT-1	Day[3]	55	52	49	55 dBA L_{50} or amb.		50 dBA L_{50} or amb.	33	N	N
	Day[4]	55	50	49				33	N	N
	Day[5]	59	59	55				33	N	N
	Day[6]	57	52	49				33	N	N
	Eve[7]	53	50	49				33	N	N
	Night[8]	49	48	47				33	N	N
OSW	Night	53	52	51	55 dBA L_{50} or amb.		50 dBA L_{50} or amb.	32	N	N

Notes:

1 These values represent the logarithmic addition of ambient SPL from Table 4.7-12a and predicted MGS Unit 3 operation from Table 4.7-10.
2 With MGS Units 1 and 2 operating.
3 With no MGS units operating during the 12:25 p.m. to 1:25 p.m. hour on December 18, 2014, from Table 4.7-2.
4 With MGS Units 1 and 2 operating at peak on December 16, 2014, from Table 4.7-4.
5 With MGS Units 1 and 2 operating at peak on December 17, 2014, from Table 4.7-4.
6 With MGS Unit 3 operating at peak on December 16, 2014, from Table 4.7-4, MGS Unit 1 & 2 not operational. Predicted MGS Unit 3 operation not added to these values.
7 With no MGS units operating, 9:00 p.m. to 10:00 p.m. on December 16, 2014.
8 L_{eq} is an energy average of four quietest consecutive hours from survey (December 16, 2014, 00:25 to 04:25 a.m.); L_{50} and L_{90} are averages of these statistical values from each of the same 4 hours.

CEC = California Energy Commission
dBA = A-Weighted equivalent decibel
ID = Identification
L_{50} = the noise levels equaled or exceeded during 50 percent of the measured time interval
L_{90} = the noise levels equaled or exceeded during 90 percent of the measured time interval
L_{eq} = equivalent sound level
LT = Long-term
MGS = Mandalay Generating Station
mph = miles per hour
OSW = Oxnard Shores West
P3 = Puente Power Plant
SPL = Sound Pressure Level
ST = Short-Term

Table 4.7-13a
P3 Operation Noise Impact Assessment (West Winds Conditions, MGS Unit 3 Offline)

Rcvr. ID	Time of Day	Representative Ambient SPL (dBA)[1]			City of Oxnard or Ventura County Criteria (Day, Evening, Night)			Estimated Noise Level (dBA), under West Winds Conditions (wind speed = 6 mph)	Per Scenario: City of Oxnard or Ventura County Impact? (Y/N)	Per Scenario, CEC Impact, if Estimated > L_{90}+10 dBA? (Y/N)
		L_{eq}	L_{50}	L_{90}	Day	Eve	Night			
LT-2	Day[2]	60	54	50	55 dBA L_{eq} or amb. +3 dBA	50 dBA L_{eq} or amb. +3 dBA	45 dBA L_{eq} or amb. +3 dBA	40	N	N
	Eve	48	42	40				40	N	N
	Night	49	42	41				40	N	N
LT-3	Day[3]	63	61	47	55 dBA L_{50} or amb.		50 dBA L_{50} or amb.	46	N	N
	Day[4]	67	67	60				46	N	N
	Day[5]	65	64	57				46	N	N
	Eve[7]	61	55	46				46	N	N
	Night[8]	54	44	42				46	N	N
LT-1	Day[3]	55	51	46	55 dBA L_{50} or amb.		50 dBA L_{50} or amb.	41	N	N
	Day[4]	54	49	47				41	N	N
	Day[5]	59	59	55				41	N	N
	Eve[7]	52	48	46				41	N	N
	Night[8]	46	45	43				41	N	N
OSW	Night	52	51	50	55 dBA L_{50} or amb.		50 dBA L_{50} or amb.	40	N	N

Notes:

[1] Unless otherwise noted, values for LT-2 and OSW are based on partial-hour ST measurements (see Table 4.7-1), and values for LT-1 and LT-3 are full hours and based on LT measurement data (see Tables 4.7-2 and 4.7-3).

[2] With MGS Units 1 and 2 operating.

[3] With no MGS units operating during the 12:25 p.m. to 1:25 p.m. hour on December 18, 2014, from Table 4.7-2.

[4] With MGS Units 1 and 2 operating at peak on December 16, 2014, from Table 4.7-4.

[5] With MGS Units 1 and 2 operating at peak on December 17, 2014, from Table 4.7-4.

[7] With no MGS units operating, 9:00 p.m. to 10:00 p.m. on December 16, 2014.

[8] L_{eq} is an energy average of four quietest consecutive hours from survey (December 16, 2014, 00:25 to 04:25 a.m.); L_{50} and L_{90} are averages of these statistical values from each of the same 4 hours.

CEC = California Energy Commission
dBA = A-Weighted equivalent decibel
ID = Identification
L_{50} = the noise levels equaled or exceeded during 50 percent of the measured time interval
L_{90} = the noise levels equaled or exceeded during 90 percent of the measured time interval
L_{eq} = equivalent sound level
LT = Long-term
MGS = Mandalay Generating Station
mph = miles per hour
OSW = Oxnard Shores West
P3 = Puente Power Plant
SPL = Sound Pressure Level
ST = Short-Term

Table 4.7-13b
P3 Operation Noise Impact Assessment (West Winds Conditions, MGS Unit 3 Online)

Rcvr. ID	Time of Day	Representative Ambient SPL (dBA)[1]			City of Oxnard or Ventura County Criteria (Day, Evening, Night)			Estimated Noise Level (dBA), under West Winds Conditions (wind speed = 6 mph)	Per Scenario: City of Oxnard or Ventura County Impact? (Y/N)	Per Scenario, CEC Impact, if Estimated > L_{90}+10 dBA? (Y/N)
		L_{eq}	L_{50}	L_{90}	Day	Eve	Night			
LT-2	Day[2]	60	54	50	55 dBA L_{eq} or amb. +3 dBA	50 dBA L_{eq} or amb. +3 dBA	45 dBA L_{eq} or amb. +3 dBA	40	N	N
	Eve	48	42	41				40	N	N
	Night	49	42	42				40	N	N
LT-3	Day[3]	64	62	57	55 dBA L_{50} or amb.		50 dBA L_{50} or amb.	46	N	N
	Day[4]	67	67	61				46	N	N
	Day[5]	66	65	60				46	N	N
	Day[6]	63	61	50				46	N	N
	Eve[7]	62	59	56				46	N	N
	Night[8]	58	56	56				46	N	N
LT-1	Day[3]	56	54	52	55 dBA L_{50} or amb.		50 dBA L_{50} or amb.	41	N	N
	Day[4]	56	53	52				41	N	N
	Day[5]	60	60	56				41	N	N
	Day[6]	57	52	49				41	N	N
	Eve[7]	55	53	52				41	N	N
	Night[8]	52	52	52				41	N	N
OSW	Night	55	54	54	55 dBA L_{50} or amb.		50 dBA L_{50} or amb.	40	N	N

Notes:

1 These values represent the logarithmic addition of ambient SPL from Table 4.7-13a and predicted MGS Unit 3 operation from Table 4.7-10.
2 With MGS Units 1 and 2 operating.
3 With no MGS units operating during the 12:25 p.m. to 1:25 p.m. hour on December 18, 2014, from Table 4.7-2.
4 With MGS Units 1 and 2 operating at peak on December 16, 2014, from Table 4.7-4.
5 With MGS Units 1 and 2 operating at peak on December 17, 2014, from Table 4.7-4.
6 With MGS Unit 3 operating at peak on December 16, 2014, from Table 4.7-4, MGS Unit 1 & 2 not operational. Predicted MGS Unit 3 operation not added to these values.
7 With no MGS units operating, 9:00 p.m. to 10:00 p.m. on December 16, 2014.
8 L_{eq} is an energy average of four quietest consecutive hours from survey (December 16, 2014, 00:25 to 04:25 a.m.); L_{50} and L_{90} are averages of these statistical values from each of the same 4 hours.

CEC = California Energy Commission
dBA = A-Weighted equivalent decibel
ID = Identification
L_{50} = the noise levels equaled or exceeded during 50 percent of the measured time interval
L_{90} = the noise levels equaled or exceeded during 90 percent of the measured time interval
L_{eq} = equivalent sound level
LT = Long-term
MGS = Mandalay Generating Station
mph = miles per hour
OSW = Oxnard Shores West
P3 = Puente Power Plant
SPL = Sound Pressure Level
ST = Short-Term

Table 4.7-14a
Future Ambient Noise Prediction (Calm Conditions, MGS Unit 3 Offline)

Receiver ID	Time of Day	Existing Representative Ambient SPL (dBA)[1]			Estimated Noise Level (dBA), under Calm Conditions (wind speed = 0 mph)	Predicted Future Ambient SPL (dBA)		
		L_{eq}	L_{50}	L_{90}		L_{eq}	L_{50}	L_{90}
LT-2	Day[2]	60	54	50	36	60	54	50
	Eve	48	42	40	36	48	43	41
	Night	49	42	41	36	49	43	42
LT-3	Day[3]	63	61	47	42	63	61	48
	Day[4]	67	67	60	42	67	67	60
	Day[5]	65	64	57	42	65	64	57
	Eve[7]	61	55	46	42	61	55	47
	Night[8]	54	44	42	42	54	46	45
LT-1	Day[3]	55	51	46	36	55	51	46
	Day[4]	54	49	47	36	54	49	47
	Day[5]	59	59	55	36	59	59	55
	Eve[7]	52	48	46	36	52	48	46
	Night[8]	46	45	43	36	46	46	44
OSW	Night	52	51	50	35	52	51	50

Notes:

[1] Unless otherwise noted, values for LT-2 and OSW are based on partial-hour ST measurements (see Table 4.7-1), and values for LT-1 and LT-3 are full hours and based on LT measurement data (see Tables 4.7-2 and 4.7-3).

[2] With MGS Units 1 and 2 operating.

[3] With no MGS units operating during the 12:25 p.m. to 1:25 p.m. hour on December 18, 2014, from Table 4.7-2.

[4] With MGS Units 1 and 2 operating at peak on December 16, 2014, from Table 4.7-4.

[5] With MGS Units 1 and 2 operating at peak on December 17, 2014, from Table 4.7-4.

[7] With no MGS units operating, 9:00 p.m. to 10:00 p.m. on December 16, 2014.

[8] L_{eq} is an energy average of four quietest consecutive hours from survey (December 16, 2014, 00:25 to 04:25 a.m.); L_{50} and L_{90} are averages of these statistical values from each of the same 4 hours.

CEC = California Energy Commission
dBA = A-Weighted equivalent decibel
ID = Identification
L_{50} = the noise levels equaled or exceeded during 50 percent of the measured time interval
L_{90} = the noise levels equaled or exceeded during 90 percent of the measured time interval
L_{eq} = equivalent sound level
LT = Long-term
MGS = Mandalay Generating Station
mph = miles per hour
OSW = Oxnard Shores West
P3 = Puente Power Plant
SPL = Sound Pressure Level
ST = Short-Term

Table 4.7-14b
Future Ambient Noise Prediction (Calm Conditions, MGS Unit 3 Online)

Receiver ID	Time of Day	Existing Representative Ambient SPL (dBA)[1]			Estimated Noise Level (dBA), under Calm Conditions (wind speed = 0 mph)	Predicted Future Ambient SPL (dBA)		
		L_{eq}	L_{50}	L_{90}		L_{eq}	L_{50}	L_{90}
LT-2	Day[2]	60	54	50	36	60	54	50
	Eve	48	42	41	36	48	43	42
	Night	49	42	42	36	49	43	43
LT-3	Day[3]	63	62	54	42	63	62	54
	Day[4]	67	67	61	42	67	67	61
	Day5	65	64	58	42	65	64	58
	Day[6]	63	61	50	42	63	61	51
	Eve[7]	62	57	54	42	62	57	54
	Night[8]	57	54	53	42	57	54	53
LT-1	Day[3]	56	52	50	36	56	52	50
	Day[4]	55	51	50	36	55	51	50
	Day[5]	59	59	56	36	59	59	56
	Day[6]	57	52	49	36	57	52	49
	Eve[7]	53	51	50	36	53	51	50
	Night[8]	50	49	48	36	50	49	48
OSW	Night	53	53	52	35	53	53	52

Notes:

1 These values represent the logarithmic addition of ambient SPL from Table 4.7-13a and predicted MGS Unit 3 operation from Table 4.7-10.
2 With MGS Units 1 and 2 operating.
3 With no MGS units operating during the 12:25 p.m. to 1:25 p.m. hour on December 18, 2014, from Table 4.7-2.
4 With MGS Units 1 and 2 operating at peak on December 16, 2014, from Table 4.7-4.
5 With MGS Units 1 and 2 operating at peak on December 17, 2014, from Table 4.7-4.
6 With MGS Unit 3 operating at peak on December 16, 2014, from Table 4.7-4, MGS Unit 1 & 2 not operational. Predicted MGS Unit 3 operation not added to these values.
7 With no MGS units operating, 9:00 p.m. to 10:00 p.m. on December 16, 2014.
8 L_{eq} is an energy average of four quietest consecutive hours from survey (December 16, 2014, 00:25 to 04:25 a.m.); L_{50} and L_{90} are averages of these statistical values from each of the same 4 hours.

CEC = California Energy Commission
dBA = A-Weighted equivalent decibel
ID = Identification
L_{50} = the noise levels equaled or exceeded during 50 percent of the measured time interval
L_{90} = the noise levels equaled or exceeded during 90 percent of the measured time interval
L_{eq} = equivalent sound level
LT = Long-term
MGS = Mandalay Generating Station
mph = miles per hour
OSW = Oxnard Shores West
P3 = Puente Power Plant
SPL = Sound Pressure Level
ST = Short-Term

Table 4.7-15a
Future Ambient Noise Prediction (East Winds Conditions, MGS Unit 3 Offline)

Receiver ID	Time of Day	Existing Representative Ambient SPL (dBA)[1]			Estimated Noise Level (dBA), under East Winds Conditions (wind speed = 7 mph)	Predicted Future Ambient SPL (dBA)		
		L_{eq}	L_{50}	L_{90}		L_{eq}	L_{50}	L_{90}
LT-2	Day[2]	60	54	50	34	60	54	50
	Eve	48	42	40	34	48	43	41
	Night	49	42	41	34	49	43	42
LT-3	Day[3]	63	61	47	39	63	61	48
	Day[4]	67	67	60	39	67	67	60
	Day[5]	65	64	57	39	65	64	57
	Eve[7]	61	55	46	39	61	55	47
	Night[8]	54	44	42	39	54	45	44
LT-1	Day[3]	55	51	46	33	55	51	46
	Day[4]	54	49	47	33	54	49	47
	Day[5]	59	59	55	33	59	59	55
	Eve[7]	52	48	46	33	52	48	46
	Night[8]	46	45	43	33	46	46	44
OSW	Night	52	51	50	32	52	51	50

Notes:

[1] Unless otherwise noted, values for LT-2 and OSW are based on partial-hour ST measurements (see Table 4.7-1), and values for LT-1 and LT-3 are full hours and based on LT measurement data (see Tables 4.7-2 and 4.7-3).
[2] With MGS Units 1 and 2 operating.
[3] With no MGS units operating during the 12:25 p.m. to 1:25 p.m. hour on December 18, 2014, from Table 4.7-2.
[4] With MGS Units 1 and 2 operating at peak on December 16, 2014, from Table 4.7-4.
[5] With MGS Units 1 and 2 operating at peak on December 17, 2014, from Table 4.7-4.
[7] With no MGS units operating, 9:00 p.m. to 10:00 p.m. on December 16, 2014.
[8] L_{eq} is an energy average of four quietest consecutive hours from survey (December 16, 2014, 00:25 to 04:25 a.m.); L_{50} and L_{90} are averages of these statistical values from each of the same 4 hours.

CEC = California Energy Commission
dBA = A-Weighted equivalent decibel
ID = Identification
L_{50} = the noise levels equaled or exceeded during 50 percent of the measured time interval
L_{90} = the noise levels equaled or exceeded during 90 percent of the measured time interval
L_{eq} = equivalent sound level
LT = Long-term
MGS = Mandalay Generating Station
mph = miles per hour
OSW = Oxnard Shores West
P3 = Puente Power Plant
SPL = Sound Pressure Level
ST = Short-Term

Table 4.7-15b
Future Ambient Noise Prediction (East Winds Conditions, MGS Unit 3 Online)

Receiver ID	Time of Day	Existing Representative Ambient SPL (dBA)[1]			Estimated Noise Level (dBA), under East Winds Conditions (wind speed = 7 mph)	Predicted Future Ambient SPL (dBA)		
		L_{eq}	L_{50}	L_{90}		L_{eq}	L_{50}	L_{90}
LT-2	Day[2]	60	54	50	34	60	54	50
	Eve	48	42	41	34	48	43	42
	Night	49	42	42	34	49	43	43
LT-3	Day[3]	63	62	54	39	63	62	54
	Day[4]	67	67	61	39	67	67	61
	Day5	65	64	58	39	65	64	58
	Day[6]	63	61	50	39	63	61	51
	Eve[7]	62	57	54	39	62	57	54
	Night[8]	57	54	53	39	57	54	53
LT-1	Day[3]	56	52	50	33	56	52	50
	Day[4]	55	51	50	33	55	51	50
	Day[5]	59	59	56	33	59	59	56
	Day[6]	57	52	49	33	57	52	49
	Eve[7]	53	51	50	33	53	51	50
	Night[8]	50	49	48	33	50	49	48
OSW	Night	53	53	52	32	53	53	52

Notes:

[1] These values represent the logarithmic addition of ambient SPL from Table 4.7-12a and predicted MGS Unit 3 operation from Table 4.7-10.
[2] With MGS Units 1 and 2 operating.
[3] With no MGS units operating during the 12:25 p.m. to 1:25 p.m. hour on December 18, 2014, from Table 4.7-2.
[4] With MGS Units 1 and 2 operating at peak on December 16, 2014, from Table 4.7-4.
[5] With MGS Units 1 and 2 operating at peak on December 17, 2014, from Table 4.7-4.
[6] With MGS Unit 3 operating at peak on December 16, 2014, from Table 4.7-4, MGS Unit 1 & 2 not operational. Predicted MGS Unit 3 operation not added to these values.
[7] With no MGS units operating, 9:00 p.m. to 10:00 p.m. on December 16, 2014.
[8] L_{eq} is an energy average of four quietest consecutive hours from survey (December 16, 2014, 00:25 to 04:25 a.m.); L_{50} and L_{90} are averages of these statistical values from each of the same 4 hours.

CEC = California Energy Commission
dBA = A-Weighted equivalent decibel
ID = Identification
L_{50} = the noise levels equaled or exceeded during 50 percent of the measured time interval
L_{90} = the noise levels equaled or exceeded during 90 percent of the measured time interval
L_{eq} = equivalent sound level
LT = Long-term
MGS = Mandalay Generating Station
mph = miles per hour
OSW = Oxnard Shores West
P3 = Puente Power Plant
SPL = Sound Pressure Level
ST = Short-Term

Table 4.7-16a
Future Ambient Noise Prediction (West Winds Conditions, MGS Unit 3 Offline)

Receiver ID	Time of Day	Existing Representative Ambient SPL (dBA)[1]			Estimated Noise Level (dBA), under West Winds Conditions (wind speed = 6 mph)	Predicted Future Ambient SPL (dBA)		
		L_{eq}	L_{50}	L_{90}		L_{eq}	L_{50}	L_{90}
LT-2	Day[2]	60	54	50	40	60	54	50
	Eve	48	42	40	40	48	44	43
	Night	49	42	41	40	49	44	44
LT-3	Day[3]	63	61	47	46	63	61	48
	Day[4]	67	67	60	46	67	67	60
	Day[5]	65	64	57	46	65	64	57
	Eve[7]	61	55	46	46	61	55	49
	Night[8]	54	44	42	46	54	48	47
LT-1	Day[3]	55	51	46	41	55	51	47
	Day[4]	54	49	47	41	54	50	48
	Day[5]	59	59	55	41	59	59	55
	Eve[7]	52	48	46	41	52	49	47
	Night[8]	46	45	43	41	47	46	45
OSW	Night	52	51	50	40	52	51	50

Notes:

[1] Unless otherwise noted, values for LT-2 and OSW are based on partial-hour ST measurements (see Table 4.7-1), and values for LT-1 and LT-3 are full hours and based on LT measurement data (see Tables 4.7-2 and 4.7-3).

[2] With MGS Units 1 and 2 operating.

[3] With no MGS units operating during the 12:25 p.m. to 1:25 p.m. hour on December 18, 2014, from Table 4.7-2.

[4] With MGS Units 1 and 2 operating at peak on December 16, 2014, from Table 4.7-4.

[5] With MGS Units 1 and 2 operating at peak on December 17, 2014, from Table 4.7-4.

[7] With no MGS units operating, 9:00 p.m. to 10:00 p.m. on December 16, 2014.

[8] L_{eq} is an energy average of four quietest consecutive hours from survey (December 16, 2014, 00:25 to 04:25 a.m.); L_{50} and L_{90} are averages of these statistical values from each of the same 4 hours.

CEC = California Energy Commission
dBA = A-Weighted equivalent decibel
ID = Identification
L_{50} = the noise levels equaled or exceeded during 50 percent of the measured time interval
L_{90} = the noise levels equaled or exceeded during 90 percent of the measured time interval
L_{eq} = equivalent sound level
LT = Long-term
MGS = Mandalay Generating Station
mph = miles per hour
OSW = Oxnard Shores West
P3 = Puente Power Plant
SPL = Sound Pressure Level
ST = Short-Term

Table 4.7-16b
Future Ambient Noise Prediction (West Winds Conditions, MGS Unit 3 Online)

Receiver ID	Time of Day	Existing Representative Ambient SPL (dBA)[1]			Estimated Noise Level (dBA), under West Winds Conditions (wind speed = 6 mph)	Predicted Future Ambient SPL (dBA)		
		L_{eq}	L_{50}	L_{90}		L_{eq}	L_{50}	L_{90}
LT-2	Day[2]	60	54	50	40	60	54	50
	Eve	48	42	41	40	49	44	44
	Night	49	42	42	40	50	44	44
LT-3	Day[3]	63	62	54	46	63	62	55
	Day[4]	67	67	61	46	67	67	61
	Day5	65	64	58	46	65	64	58
	Day[6]	63	61	50	46	63	61	51
	Eve[7]	62	57	54	46	62	57	55
	Night[8]	57	54	53	46	57	55	54
LT-1	Day[3]	56	52	50	41	56	52	51
	Day[4]	55	51	50	41	55	51	51
	Day[5]	59	59	56	41	59	59	56
	Day[6]	57	52	49	41	57	52	50
	Eve[7]	53	51	50	41	53	51	51
	Night[8]	50	49	48	41	51	50	49
OSW	Night	53	53	52	40	53	53	52

Notes:

1 These values represent the logarithmic addition of ambient SPL from Table 4.7-13a and predicted MGS Unit 3 operation from Table 4.7-10.
2 With MGS Units 1 and 2 operating.
3 With no MGS units operating during the 12:25 p.m. to 1:25 p.m. hour on December 18, 2014, from Table 4.7-2.
4 With MGS Units 1 and 2 operating at peak on December 16, 2014, from Table 4.7-4.
5 With MGS Units 1 and 2 operating at peak on December 17, 2014, from Table 4.7-4.
6 With MGS Unit 3 operating at peak on December 16, 2014, from Table 4.7-4, MGS Unit 1 & 2 not operational. Predicted MGS Unit 3 operation not added to these values.
7 With no MGS units operating, 9:00 p.m. to 10:00 p.m. on December 16, 2014.
8 L_{eq} is an energy average of four quietest consecutive hours from survey (December 16, 2014, 00:25 to 04:25 a.m.); L_{50} and L_{90} are averages of these statistical values from each of the same 4 hours.

CEC = California Energy Commission
dBA = A-Weighted equivalent decibel
ID = Identification
L_{50} = the noise levels equaled or exceeded during 50 percent of the measured time interval
L_{90} = the noise levels equaled or exceeded during 90 percent of the measured time interval
L_{eq} = equivalent sound level
LT = Long-term
MGS = Mandalay Generating Station
mph = miles per hour
OSW = Oxnard Shores West
P3 = Puente Power Plant
SPL = Sound Pressure Level
ST = Short-Term

Table 4.7-17
Future Ambient Noise Prediction (Construction, High Estimate)

Receiver ID	Time of Day	Existing Representative Ambient SPL (dBA)[1]			High Estimate of Cons. Noise (dBA)	Predicted Future Ambient SPL (dBA)		
		L_{eq}	L_{50}	L_{90}		L_{eq}	L_{50}	L_{90}
LT-2	Day[2]	60	54	50	47	60	55	52
	Eve	48	42	40	47	51	48	48
	Night	49	42	41	47	51	48	48
LT-3	Day[3]	63	61	47	52	63	62	53
	Day[4]	67	67	60	52	67	67	61
	Day[5]	65	64	57	52	65	64	58
	Day[6]	63	61	50	52	63	62	54
	Eve[7]	61	55	46	52	62	57	53
	Night[8]	54	44	42	52	56	53	52
LT-1	Day[3]	55	51	46	47	56	52	50
	Day[4]	54	49	47	47	55	51	50
	Day[5]	59	59	55	47	59	59	56
	Day[6]	57	52	49	47	57	53	51
	Eve[7]	52	48	46	47	53	51	50
	Night[8]	46	45	43	47	50	49	48
OSW	Night	52	51	50	47	53	52	52

Notes:

1 Unless otherwise noted, values for LT-2 and Oxnard Shores West (OSW) are based on partial-hour ST measurements (see Table 4.7-1), and values for LT-1 and LT-3 are full hours and based on LT measurement data (see Tables 4.7-2 and 4.7-3).
2 With MGS Units 1 and 2 operating.
3 With no MGS units operating during the 12:25 p.m. to 1:25 p.m. hour on December 18, 2014, from Table 4.7-2.
4 With MGS Units 1 and 2 operating at peak on December 16, 2014, from Table 4.7-4.
5 With MGS Units 1 and 2 operating at peak on December 17, 2014, from Table 4.7-4.
6 With MGS Unit 3 operating at peak on December 16, 2014, from Table 4.7-4.
7 With no MGS units operating, 9:00 p.m. to 10:00 p.m. on December 16, 2014.
8 L_{eq} is an energy average of four quietest consecutive hours from survey (December 16, 2014, 00:25 to 04:25 a.m.); L_{50} and L_{90} are averages of these statistical values from each of the same 4 hours contribution as described in Section 4.7.1.3.

Does not include pile-driving noise.

dBA = A-Weighted equivalent decibel
ID = Identification
L_{50} = the noise levels equaled or exceeded during 50 percent of the measured time interval
L_{90} = the noise levels equaled or exceeded during 90 percent of the measured time interval
L_{eq} = equivalent sound level
LT = Long-term
MGS = Mandalay Generating Station
OSW = Oxnard Shores West
SPL = Sound Pressure Level
ST = Short-Term

Table 4.7-18
Future Ambient Noise Prediction (Construction, Low Estimate)

Receiver ID	Time of Day	Existing Representative Ambient SPL (dBA)[1]			Low Estimate of Cons. Noise (dBA)	Predicted Future Ambient SPL (dBA)		
		L_{eq}	L_{50}	L_{90}		L_{eq}	L_{50}	L_{90}
LT-2	Day[2]	60	54	50	33	60	54	50
	Eve	48	42	40	33	48	43	41
	Night	49	42	41	33	49	43	42
LT-3	Day[3]	63	61	47	38	63	61	48
	Day[4]	67	67	60	38	67	67	60
	Day[5]	65	64	57	38	65	64	57
	Day[6]	63	61	50	38	63	61	50
	Eve[7]	61	55	46	38	61	55	47
	Night[8]	54	44	42	38	54	45	43
LT-1	Day[3]	55	51	46	33	55	51	46
	Day[4]	54	49	47	33	54	49	47
	Day[5]	59	59	55	33	59	59	55
	Day[6]	57	52	49	33	57	52	49
	Eve[7]	52	48	46	33	52	48	46
	Night[8]	46	45	43	33	46	45	43
OSW	Night	52	51	50	33	52	51	51

Notes:

1 Unless otherwise noted, values for LT-2 and OSW are based on partial-hour ST measurements (see Table 4.7-1), and values for LT-1 and LT-3 are full hours and based on LT measurement data (see Tables 4.7-2 and 4.7-3).
2 With MGS Units 1 and 2 operating.
3 With no MGS units operating during the 12:25 p.m. to 1:25 p.m. hour on December 18, 2014, from Table 4.7-2/
4 With MGS Units 1 and 2 operating at peak on December 16, 2014, from Table 4.7-4.
5 With MGS Units 1 and 2 operating at peak on December 17, 2014, from Table 4.7-4.
6 With MGS Unit 3 operating at peak on December 16, 2014, from Table 4.7-4.
7 With no MGS units operating, 9:00 p.m. to 10:00 p.m. on December 16, 2014.
8 L_{eq} is an energy average of four quietest consecutive hours from survey (December 16, 2014, 00:25 to 04:25 a.m.); L_{50} and L_{90} are averages of these statistical values from each of the same 4 hours.

Does not include pile-driving noise.

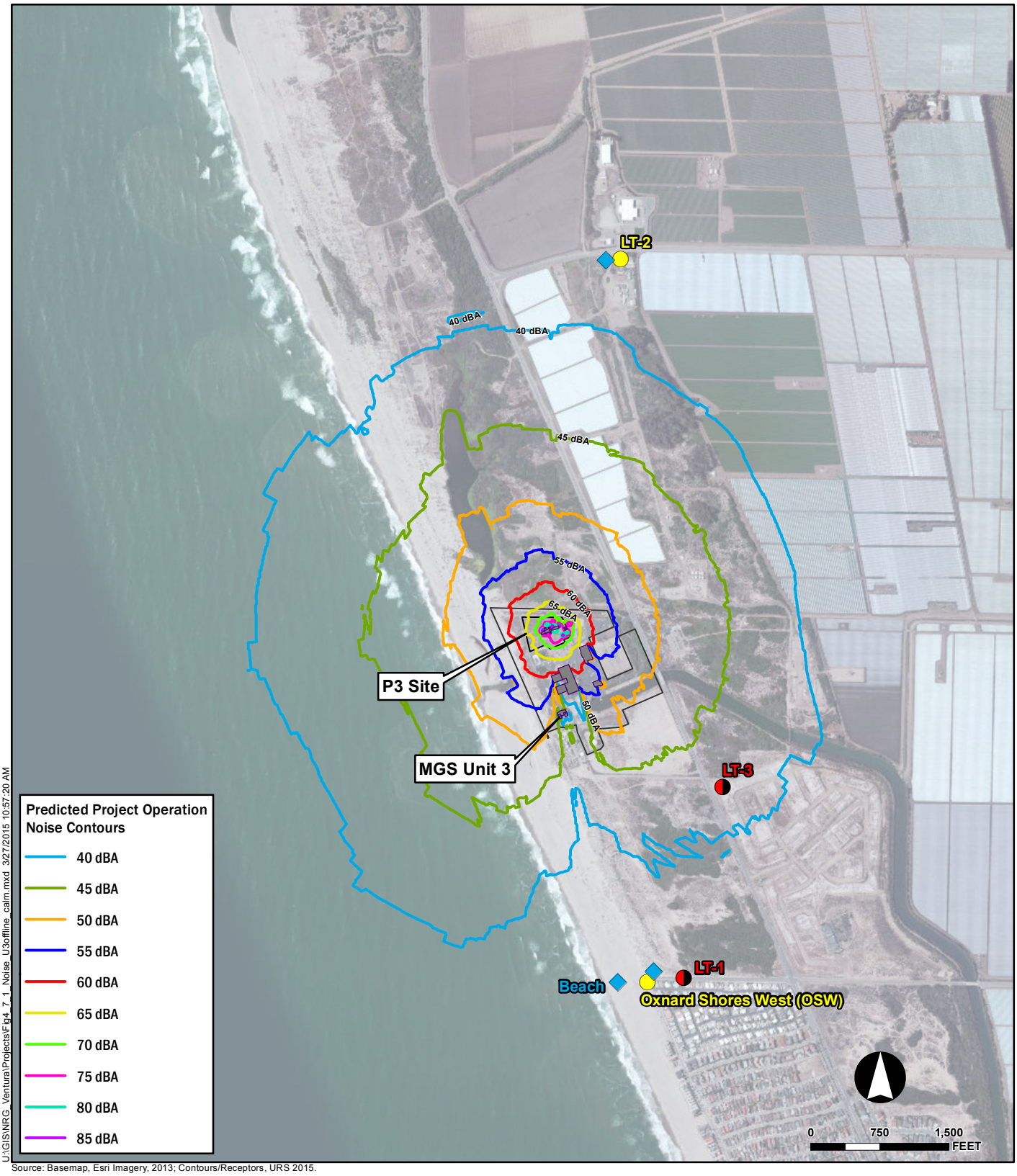
dBA = A-Weighted equivalent decibel
ID = Identification
L_{50} = the noise levels equaled or exceeded during 50 percent of the measured time interval
L_{90} = the noise levels equaled or exceeded during 90 percent of the measured time interval
L_{eq} = equivalent sound level
LT = Long-term
MGS = Mandalay Generating Station
OSW = Oxnard Shores West
SPL = Sound Pressure Level
ST = Short-Term

Table 4.7-19
Summary of LORS – Noise and Vibration

LORS	Administering Agency	Applicability	AFC Section
Federal			
Occupational Safety and Health Administration Occupational Noise Exposure; Hearing Conservation Amendment (Federal Register 48 (46), 9738 – 9785 (1983)	OSHA	Sets regulations for occupational noise exposure and hearing conservation programs.	4.7.5.1, 4.7.2.2, 4.7.4
State			
CEC siting guidelines (CEC-140-2007-003)	CEC	Provides guidance on power plant siting evaluation with respect to environmental effects	4.7.5.2, 4.7.2.1
Title 8, Group 15, Article 105, Sections 5095-5100.	Cal/OSHA	Sets regulations for occupational noise exposure and hearing conservation programs.	4.7.5.2, 4.7.2.2, 4.7.4
Local			
Construction Noise Threshold Criteria and Control Plan	County of Ventura	Establishes criteria for construction noise impact evaluation	4.7.5.3, 4.7.2.2, 4.7.4
County of Ventura General Plan (Section 2.16.2)	County of Ventura	Noise impact assessment for new development	4.7.5.3, 4.7.2.2
Oxnard City Code (OCC) Article XI of Chapter 7	City of Oxnard	Noise ordinance sets limits on operational noise	4.7.5.3, 4.7.2.2
Oxnard General Plan (2030) Draft Background Report	City of Oxnard	Provides suggested noise policies for new development	4.7.5.3, 4.7.2.2

Table 4.7-20
Involved Agencies and Agency Contacts

Issue	Agency	Contact/Title	Telephone	E-mail
City Land Use Policy	City of Oxnard	Ashley Golden (Interim) Planning Division Manager	(805) 385-7858	Ashley.golden@ci.oxnard.ca.us



Source: Basemap, Esri Imagery, 2013; Contours/Receptors, URS 2015.

Noise Sensitive Receptor (NSR)

Short-term (ST) Sound Pressure Level (SPL) Measurement Location

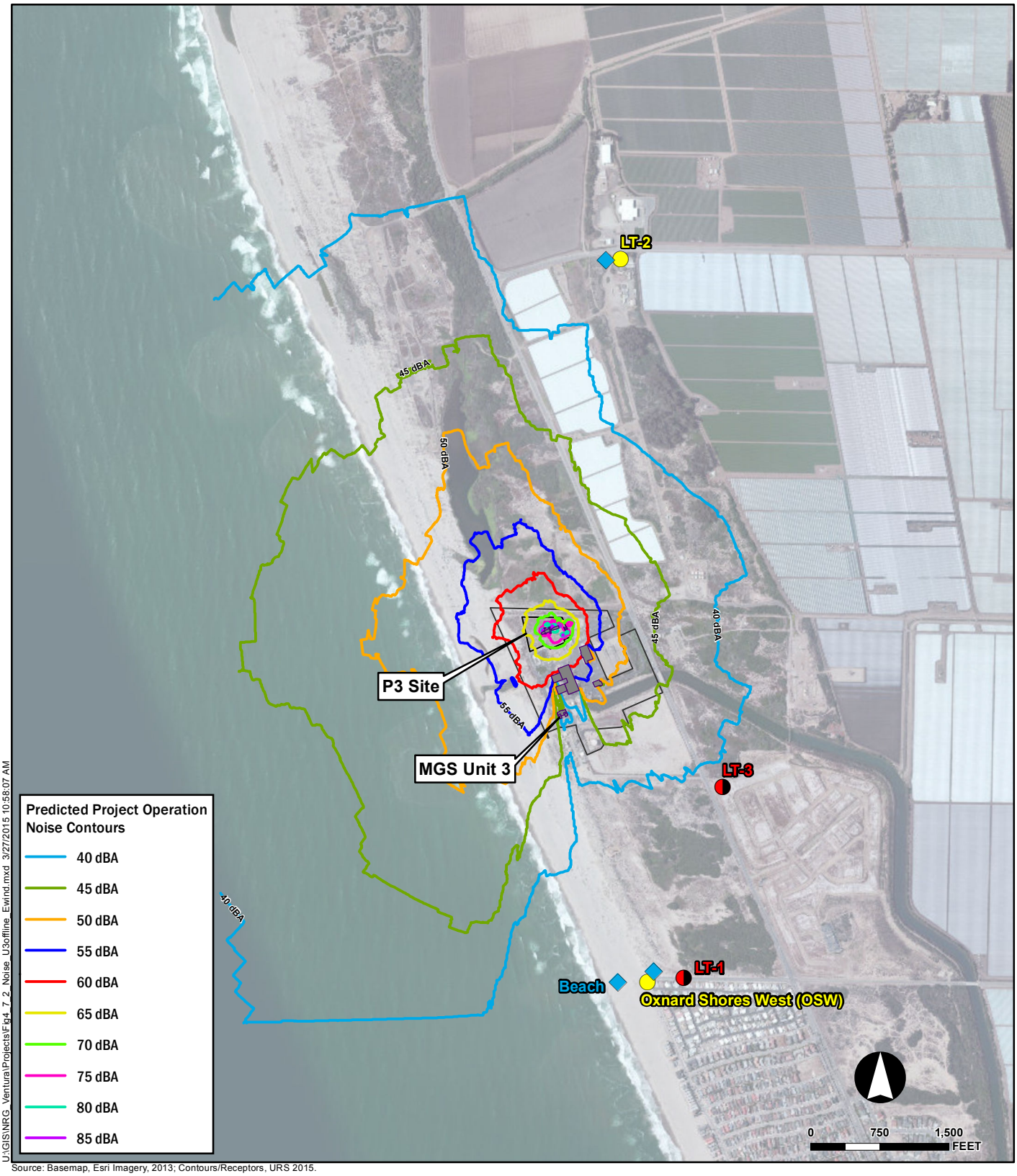
NSR and Long-term (LT) SPL Monitoring Location

Building

MANDALAY GENERATING STATION (MGS)
UNIT 3 OFFLINE, CALM CONDITIONS

NRG
Puente Power Project
April 2015 Oxnard, California

FIGURE 4.7-1



Source: Basemap, Esri Imagery, 2013; Contours/Receptors, URS 2015.

Noise Sensitive Receptor (NSR)

Short-term (ST) Sound Pressure Level (SPL) Measurement Location

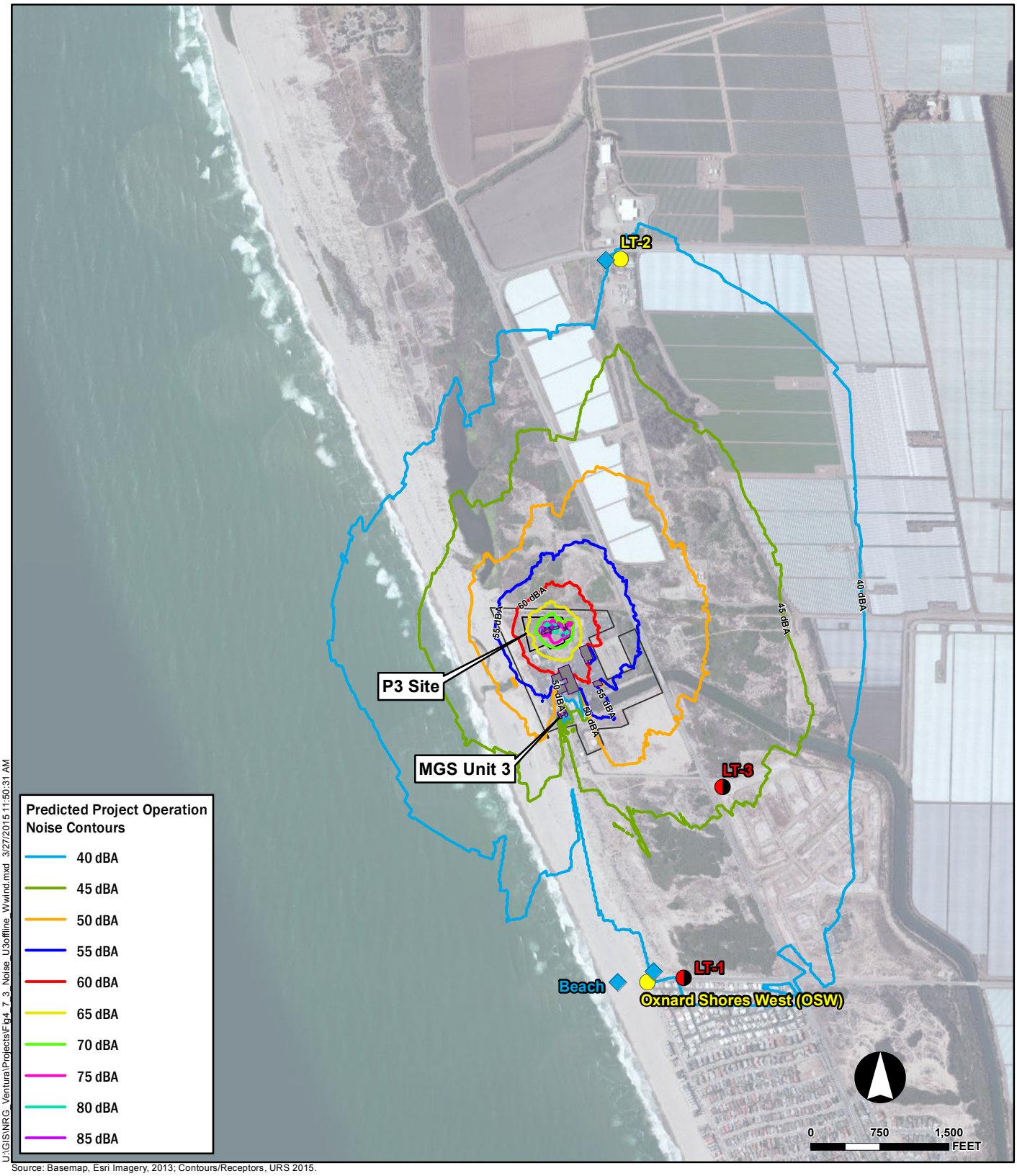
NSR and Long-term (LT) SPL Monitoring Location

Building

MANDALAY GENERATING STATION (MGS)
UNIT 3 OFFLINE, EAST WINDS CONDITIONS

NRG
Puente Power Project
April 2015 Oxnard, California

FIGURE 4.7-2



Source: Basemap, Esri Imagery, 2013; Contours/Receptors, URS 2015.

Noise Sensitive Receptor (NSR)

Short-term (ST) Sound Pressure Level (SPL) Measurement Location

NSR and Long-term (LT) SPL Monitoring Location

Building

MANDALAY GENERATING STATION (MGS)
UNIT 3 OFFLINE, WEST WINDS CONDITIONS

NRG
Puente Power Project
April 2015 Oxnard, California

FIGURE 4.7-3