

## **5.5 NOISE**

*The purpose of this section is to analyze project-related noise source impacts on-site and to surrounding land uses. Mitigation measures are also recommended to avoid or reduce the project's impacts. This section evaluates short-term construction-related impacts as well as long-term buildout conditions. Information in this section is based on the City of Huntington Beach General Plan (1996), and the City of Huntington Beach General Plan EIR (1995). Refer to Appendix A, NOISE DATA, for the assumptions used in this analysis.*

### **ACOUSTICAL TERMINOLOGY**

#### **NOISE SCALES AND DEFINITIONS**

Sound is technically described in terms of the loudness (amplitude) of the sound and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the Decibel (dB). Since the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been revised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

Decibels are based on the logarithmic scale. The logarithmic scale compresses the wide range in sound pressure levels to a more usable range of numbers in a manner similar to the Richter scale used to measure earthquakes. In terms of human response to noise, a sound 10 dBA higher than another is judged to be twice as loud, and 20 dBA higher four times as loud, and so forth. Everyday sounds normally range from 30 dBA (very quiet) to 100 dBA (very loud). Examples, of various sound levels in different environments are shown in Exhibit 5.5-1, *SOUND LEVELS AND HUMAN RESPONSE*.

In general, a three dBA change in sound pressure level is considered a "just detectable" difference in most situations. A five dBA change is readily noticeable and a 10 dBA change is considered a doubling (or halving) of the subjective loudness. It should be noted that a three dBA increase or decrease in the average traffic noise level is realized by a doubling or halving of the traffic volume, or by about a seven mile per hour (mph) increase or decrease in speed.

For each doubling of distance from a point noise source, the sound level would decrease by six dBA. In other words, if a person is 100 feet from a machine, and moves to 200 feet from that source, sound levels would drop approximately 6 dBA. For each doubling of distance from a source, like a roadway, noise levels are reduced by 3 to 5 decibels, depending on the ground cover between the source and the receiver.

Numerous methods have been developed to measure sound over a period of time. These methods include: 1) the Community Noise Equivalent Level (CNEL); 2) the Equivalent Sound Level (Leq); and 3) Day/Night Average Sound Level (Ldn). These methods are described below.

#### **COMMUNITY NOISE EQUIVALENT LEVEL (CNEL)**

The predominant community noise rating scale used in California for land use compatibility assessments is the Community Noise Equivalent Level (CNEL). The CNEL reading represents the average of 24 hourly readings of equivalent levels, known as Leq's, based on an A-weighted decibel with upward adjustments added to account for increased noise sensitivity in the evening and night periods. These adjustments are +5 dBA for the evening, 7:00 PM to 10:00 PM, and +10 dBA for the night, 10:00 PM to 7:00 AM. CNEL may be indicated by "dBA CNEL" or just "CNEL".

## **Leq**

The Leq is the sound level containing the same total energy over a given sample time period. The Leq can be thought of as the steady sound level which, in a stated period of time, would contain the same acoustic energy as the time-varying sound level during the same period. Leq is typically computed over one, eight and 24-hour sample periods.

## **DAY NIGHT AVERAGE (LDN)**

Another commonly used method is the day/night average level or Ldn. The Ldn is a measure of the 24-hour average noise level at a given location. It was adopted by the U.S. Environmental Protection Agency (EPA) for developing criteria for the evaluation of community noise exposure. It is based on a measure of the average noise level over a given time period called the Leq. The Ldn is calculated by averaging the Leq's for each hour of the day at a given location after penalizing the "sleeping hours" (defined as 10:00 PM to 7:00 AM) by 10 dBA to account for the increased sensitivity of people to noises that occur at night. The maximum noise level recorded during a noise event is typically expressed as Lmax. The sound level exceeded over a specified time frame can be expressed as Ln (i.e., L90, L50, L10, etc.). L50 equals the level exceeded 50 percent of the time, L10 10 percent of the time, etc.

## **NOISE ATTENUATION**

Noise barriers provide approximately a five dBA noise reduction (additional reduction may be provided with a barrier of appropriate height, material, location and length). A row of buildings provides up to five dBA noise reduction with a 1.5 dBA reduction for each additional row up to a maximum reduction of approximately 10 dBA. The exact degree of noise attenuation depends on the nature and orientation of the structure and intervening barriers.

## **LAWS, ORDINANCES, REGULATIONS AND STANDARDS**

It is difficult to specify noise levels that are generally acceptable to everyone. What is annoying to one person may be unnoticed by another. Standards may be based on documented complaint activity in response to documented noise levels, or based on studies on the ability of people to sleep, talk, or work under various noise conditions. All such studies, however, recognize that individual responses vary considerably. Standards usually address the needs of most of the general population.

## **STATE OF CALIFORNIA GUIDELINES**

The California Environmental Quality Act (CEQA) was enacted in 1970 and requires that all known environmental effects of a project be analyzed, including environmental noise impacts. Under CEQA, a project has a potentially significant impact if the project exposes people to noise levels in excess of standards established in the local general plan or noise ordinance. Additionally, under CEQA, a project has a potentially significant impact if the project creates a substantial increase in the ambient noise levels in the project vicinity above levels existing without the project. If a project has a potentially significant impact, mitigation measures must be considered. If mitigation measures to reduce the impact to less than significant are not feasible due to economic, social, environmental, legal, or other conditions, the most feasible mitigation measures must be considered.



Insert Exhibit 5.5-1, Sound Levels and Human Response

**California Government Code**

California Government Code Section 65302 (f) mandates that the legislative body of each county and city adopt a noise element as part of their comprehensive General Plan. The local noise element must recognize the land use compatibility guidelines established by the State Department of Health Services as shown in Table 5.5-1, *LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENTS*.

**Table 5.5-1  
 CALIFORNIA LAND USE COMPATIBILITY NOISE GUIDELINES**

Land Use Category	Community Noise Exposure (In Terms Of CNEL)			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential - Low Density, Single-Family, Duplex, Mobile Homes	50 – 60	55 - 70	70-75	75-85
Residential - Multiple Family	50 – 65	60 - 70	70 - 75	70 – 85
Transient Lodging - Motel, Hotels	50 – 65	60 - 70	70 - 80	80 – 85
Schools, Libraries, Churches, Hospitals, Nursing Homes	50 – 70	60 - 70	70 - 80	80 – 85
Auditoriums, Concert Halls, Amphitheaters	NA	50 - 70	NA	65 – 85
Sports Arenas, Outdoor Spectator Sports	NA	50 - 75	NA	70 – 85
Playgrounds, Neighborhood Parks	50 – 70	NA	67.5 - 75	72.5 - 85
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50 – 70	NA	70 - 80	80 – 85
Office Buildings, Business Commercial and Professional	50 – 70	67.5 - 77.5	75 - 85	NA
Industrial, Manufacturing, Utilities, Agriculture	50 – 75	70 - 80	75 - 85	NA

**Source:** General Plan Guidelines, Office of Planning and Research, California, October 2003..

**Notes:**

**NORMALLY ACCEPTABLE**  
 Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

**CONDITIONALLY ACCEPTABLE**  
 New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

**NORMALLY UNACCEPTABLE**  
 New Construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

**CLEARLY UNACCEPTABLE**  
 New construction or development should generally not be undertaken.

NA: Not Applicable

The guidelines rank noise-land use compatibility in terms of “normally acceptable”, “conditionally acceptable” and “clearly unacceptable” noise levels for various land use types. Single-family homes are “normally acceptable” in exterior noise environments up to 60 CNEL and “conditionally acceptable” up to 70 CNEL. Multiple-family residential uses are “normally acceptable” up to 65 CNEL and “conditionally acceptable” up to 70 CNEL. Schools, libraries, and churches are “normally acceptable” up to 70 CNEL, as are office buildings and business, commercial and professional uses. In addition, the California Noise Insulation Standard (California Administrative Code, Title 25, Chapter 1, Subchapter 1, Article 4) requires that indoor noise levels in multi-family residences do not exceed a CNEL of 45 dBA.

## **LOCAL JURISDICTIONS**

Local agencies may regulate noise levels of most sources not regulated by the Federal or State government. They may provide standards for insulation of noise receivers either within the structure or by placement of noise barriers such as walls; and, through land use decisions, may reduce noise impacts by separating noise generators from noise sensitive uses. To provide a satisfactory noise environment and to minimize complaints about community noise, the local jurisdictions have adopted standards for evaluating the compatibility of land uses with respect to outdoor and certain indoor noise levels. The purpose of the land use compatibility analysis is to screen projects that may require specific design considerations to mitigate noise impacts.

### **City of Huntington Beach**

The City of Huntington Beach has adopted noise objectives and policies in its General Plan. These noise objectives and policies pertain to land use impacts, mobile noise sources, and stationary noise sources. The City of Huntington Beach has also adopted a Noise Ordinance (Chapter 8.40 of the Huntington Beach Municipal Code), which identifies exterior and interior noise standards, specific noise restrictions, exemptions, and variances for sources of noise within the city. The Noise Ordinance applies to all noise sources with the exception of any vehicle that is operated upon any public highway, street or right-of-way, or to the operation of any off-highway vehicle, to the extent that it is regulated in the State Vehicle Code, and all other sources of noise that are specifically exempted. The City's exterior noise standards are identified in Table 5.5-2, CITY OF HUNTINGTON BEACH NOISE ORDINANCE EXTERIOR NOISE STANDARDS. Table 5.5-3, CITY OF HUNTINGTON BEACH NOISE ORDINANCE INTERIOR NOISE STANDARDS, identifies the City's interior noise standards and prohibited interior noise levels.

In both cases, if the ambient noise level is greater than the identified noise standards, the noise standard becomes the ambient noise level without the offending noise. The Noise Ordinance exempts noise sources associated with construction activities from the City's exterior and interior noise standards provided that a permit has been obtained from the City and that the construction activities do not occur between the hours of 8:00 PM and 7:00 AM on weekdays and Saturdays, or at any time on Sundays or federal holidays.

### **City of Costa Mesa**

The City of Costa Mesa maintains a comprehensive Noise Ordinance which sets standards for noise levels citywide and provides the means to enforce the reduction of obnoxious or offensive noises. The basic noise standards outlines the typical land use compatibility standards of 65 CNEL for exterior areas and 45 CNEL for interior areas. The City of Costa Mesa limits the hours of construction activities from 7:00 AM to 8:00 PM, Monday through Friday and from 8:00AM to 6:00 PM on Saturday.

### **City of Irvine**

The City of Irvine treats construction noise separately in the City's noise ordinance because it does not represent a chronic, permanent noise source. To limit the potential nuisance from construction noise, especially for adjacent noise-sensitive receptors, the City of Irvine Noise Ordinance (Section 6-8-205 of the Municipal Code) limits the hours of construction activities from 7:00 AM to 7:00PM, Monday through Friday and from 9:00 AM to 6:00 PM on Saturday. Compliance with the City's noise ordinance of limiting construction activities to those hours indicated in the Municipal Code would reduce construction noise impacts a less than significant level. Additional "standard" conditions such as maintaining mufflers in good condition and placing construction staging areas as far from sensitive receptors would further reduce any construction related noise impact.

**Table 5.5-2  
 CITY OF HUNTINGTON BEACH NOISE ORDINANCE EXTERIOR NOISE STANDARDS**

Noise Zone	Land Uses	Noise Level	Time Period
1	All Residential Properties	55 dBA Leq 50 dBA Leq	7 AM to 10 PM 10 PM to 7 AM
2	All Professional Office and Public Institutional Properties	55 dBA Leq	Anytime
3	All Commercial Properties Except Professional Office	60 dBA Leq	Anytime
4	All Industrial Properties	70 dBA Leq	Anytime
<b>Exterior Noise Levels Prohibited:</b>			
It shall be unlawful for any person at any location within the incorporated area of the City to create any noise, or to allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person, which causes the noise level when measured on any residential, public institutional, professional, commercial or industrial property, either within or without the City, to exceed the applicable noise standards:			
(a) For a cumulative period or more than thirty (30) minutes in any hour;			
(b) Plus 5 dBA for a cumulative period of more than fifteen (15) minutes in any hour;			
(c) Plus 10 dBA for a cumulative period of more than five (5) minutes in any hour;			
(d) Plus 15 dBA for a cumulative period of more than one (1) minute in any hour; or			
(e) Plus 20 dBA for any period of time.			
In the event the ambient noise level exceeds any of the first four noise limit categories above, the cumulative period applicable to said category shall be increased to reflect said ambient noise level. In the event the ambient noise level exceeds the fifth noise limit category, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level.			
<b>Source:</b> City of Huntington Beach.			

**Table 5.5-3  
 CITY OF HUNTINGTON BEACH NOISE ORDINANCE INTERIOR NOISE STANDARDS**

Noise Zone	Land Uses	Noise Level	Time Period
1	All Residential Properties	55 dBA Leq 45 dBA Leq	7 AM to 10 PM 10 PM to 7 AM
2,3,4	All Professional Office, Public Institutional, Commercial, and Industrial Properties	55 dBA Leq	Anytime
<b>Interior Noise Levels Prohibited:</b>			
It shall be unlawful for any person at any location within the incorporated area of the City to create any noise, or to allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person, which causes the noise level when measured within any other structure on any residential, public institutional, professional, commercial or industrial property to exceed:			
(a) The noise standard for a cumulative period or more than five (5) minutes in any hour;			
(b) The noise standard plus 5 dBA for a cumulative period of more than one (1) minutes in any hour; or			
(c) The noise standard plus 10 dBA for any period of time.			
In the event the ambient noise level exceeds any of the first two noise limit categories above, the cumulative period applicable to said category shall be increased to reflect said ambient noise level. In the event the ambient noise level exceeds the third noise limit category, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level.			
<b>Source:</b> City of Huntington Beach.			

**County of Orange**

As mandated by the California Government Code, the County of Orange has adopted a noise element as a component of the County of Orange General Plan. The County of Orange Noise Element is administered by the Orange County Planning Division of the Resources and Development Management Department (RDMD) and applies to all unincorporated portions of the County. The Noise Element establishes noise criteria to ensure that each county resident's quality of life is not adversely affected by high noise levels. In general, all outdoor living areas are compatible with noise levels less than CNEL 65 dBA. Similarly, indoor living spaces are compatible with interior noise levels less than CNEL 45 dBA.

The County of Orange has also adopted a noise ordinance. The intent of the County of Orange Noise Ordinance is to control unnecessary, excessive, and annoying sound emanating from unincorporated areas of the County. Section 4-6-7 of the County's Noise Ordinance provides exemptions to the County's noise standards. It specifies that noise sources associated with

construction activity are prohibited between the hours of 8:00 PM and 7:00 AM on weekdays, including Saturday or at any time on Sunday or a Federal holiday.

## **EXISTING CONDITIONS**

### **PROPOSED DESALINATION FACILITY SITE**

#### **Noise Environment**

The primary noise sources in the project vicinity include commercial and industrial uses, as well as noise from adjacent local roadways. Both mobile and stationary noise sources contribute to the existing noise levels at the project site. Mobile noise sources consist mainly of car and truck traffic, with high volumes of traffic along Pacific Coast Highway, Magnolia Street, and Beach Boulevard (located west of the subject site). Stationary noise sources within the site vicinity include the AES Huntington Beach Generating Station (HBGS) and commercial/industrial uses located to the north along Edison Avenue and Hamilton Avenue.

#### **Noise Sensitive Receptors**

Land uses considered sensitive receptors to noise include residential areas, schools, hospitals, churches, recreational areas, office buildings and transient lodging. The site is located adjacent to primarily commercial/industrial uses. Although no residential uses exist on the proposed project site, the Ascon/Nesi Landfill (located northeast of the site) is designated for residential uses, and two contiguous mobile home parks are situated west of the subject site along the inland side of Pacific Coast Highway. Additional residential uses surround the site to the north and east. Edison Community Center exists north of the project site along the northern side of Hamilton Avenue, while Edison High School is situated northeast of the site at the intersection of Hamilton Avenue and Magnolia Street. An open space area, Huntington State Beach, and Huntington City Beach are situated south and southwest of the subject site along Pacific Coast Highway.

#### **Existing Noise Levels**

Existing ambient noise levels were measured on-site, at nearby surrounding sensitive receptors and along the proposed water delivery pipeline alignments including the underground pump stations. Noise monitoring equipment used for the ambient noise survey consisted of a Larson Davis Laboratories Model LDL 820 sound level analyzer equipped with a Larson Davis Type 2561 microphone. The instrumentation was calibrated prior to use with a Larson Davis CAL 250 acoustical calibrator to ensure the accuracy of the measurements, and complies with applicable requirements of the American National Standards Institute (ANSI) for Type I (precision) sound level meters. The accuracy of the calibrator is maintained through a program established by the manufacturer, and is traceable to the National Bureau of Standards. All instrumentation meets the requirements of ANSI S1.4-1971. The Leq, Lmax, and source of peak noise for each reading is shown below in Table 5.5-4, *EXISTING ON-SITE AND SURROUNDING AMBIENT NOISE LEVELS* and Table 5.5-5, *EXISTING OFF-SITE PIPELINE/PUMP STATION AMBIENT NOISE LEVELS*.

### **OFF-SITE PIPELINE ALIGNMENT AND UNDERGROUND PUMP STATIONS**

#### **Proposed Pipeline Alignment**

The proposed water delivery pipeline would be up to approximately ten miles in length, extending from the proposed desalination facility to the OC-44 water transmission line within the City of Costa Mesa, east of State Route 55 (SR-55) at the intersection of Del Mar Avenue and Elden Avenue. The

majority of the pipeline alignment will occur within existing public streets, easements, or other rights-

**Table 5.5-4  
EXISTING ON-SITE AND SURROUNDING AMBIENT NOISE LEVELS**

LOCATION OF NOISE READING	Leq db(A)	Lmax db(A)	PEAK NOISE (Source, db(A))
<b>ON-SITE NOISE LEVELS<sup>1</sup></b>			
Northwest Portion of Site	54.8	64.5	Airplane – 95.2
Northeast Portion of Site	56.2	70.8	Truck – 98.6
Southwest Portion of Site	60.1	69.4	Helicopter – 94.1
Southeast Portion of Site	57.8	63.7	Airplane – 91.4
<b>SURROUNDING NOISE LEVELS<sup>2</sup></b>			
Huntington State Beach, adjacent to project site.	51.8	59.9	NA
Corner of Kiowa Lane and Aloha Drive	52.6	52.9	NA
Linear park adjacent to Seaforth Lane and Hamilton Avenue	55.7	64.7	Truck
Cabrillo Mobile Home Park	64.7	75.9	Airplane
<sup>1</sup> Measurements recorded on 4/24/02. <sup>2</sup> Measurements recorded on 11/11/2004			

**Table 5.5-5  
EXISTING OFF-SITE PIPELINE/PUMP STATION AMBIENT NOISE LEVELS**

LOCATION OF NOISE READING	Leq db(A)	Lmax db(A)	PEAK NOISE (Source, db(A))
Brookhurst Street/Adams Avenue Intersection (Primary Alignment)	73.9	86.6	Automobile Horn
Harbor Boulevard/Fair Drive Intersection (Primary Alignment)	73.2	85.1	Bus
Hamilton Avenue/Bushard Street Intersection (Alternative Alignment)	71.0	86.3	Truck
Victoria Street/Placentia Avenue Intersection (Alternative Alignment)	72.6	84.3	Automobile
Del Mar Avenue/Elden Avenue Intersection (terminus of both pipeline alignments)	67.7	78.5	Automobile
OC-44 Booster Pump Station	43.9	63.7	Wildlife
Coastal Junction Booster Pump Station	58.4	71.2	Automobile
* Measurements recorded on 4/12/02 (with the exception of the Coastal Junction Pump Station, which was recorded on 2/22/05). As surrounding conditions (land uses and traffic) of each noise reading location have remained consistent since 2002, ambient noise conditions would remain relatively unchanged to present date.			

of-way (ROW) in urbanized areas. Although precise pipeline alignments may be modified during final engineering analyses, the conceptual pipeline alignments are shown in Exhibit 3-3, *CONCEPTUAL PIPELINE ALIGNMENTS*.

Portions of the pipeline alignments are proposed to be installed within areas of the Costa Mesa Country Club (Costa Mesa) and Fairview State Hospital (Costa Mesa).

**OC-44 Booster Pump Station**

The OC-44 underground booster pump station is proposed to be located within an area of unincorporated Orange County, approximately 1.5 miles south of the University of California, Irvine., and 0.5 mile north of the San Joaquin Reservoir. The proposed OC-44 booster pump station site is surrounded by open space to the north, open space and residential to the east, two existing underground pump stations, open space, and residential to the west, and open space to the south. It should be noted that the proposed pump station site is located adjacent to (but not within) a Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP) area.

The pump would be electrically powered and would be placed underground within an Orange County Resource Preservation Easement, in an area adjacent to open space and residential uses.

### **Coastal Junction Booster Pump Station**

The Coastal Junction underground booster pump station is proposed within the parking lot of St. Paul's Greek Orthodox Church within the City of Irvine, located at 4949 Alton Parkway. The underground pump station would be constructed within the north/northwestern portion of the church parking lot, in an area used for both parking and volleyball activities. The footprint of the proposed underground pump station would be approximately 100 feet by 100 feet, and would require a construction easement of 125 feet by 125 feet. The Coastal Junction pump station site is surrounded by the St. Paul's Church to the south, the Woodbridge Village Association to the west, an apartment complex to the east, and open space to the north. Refer to Table 5.5-5, *EXISTING OFF-SITE PIPELINE/PUMP STATION AMBIENT NOISE LEVELS*.

In general, ambient noise levels were lowest at the desalination facility site, nearby surrounding sensitive receptors, and the OC-44 off-site underground pump station facility. Ambient noise levels were higher along the two off-site water transmission pipeline alignments, with an average Leq of 71.7, due to automobile traffic along the proposed pipeline alignments.

## **IMPACTS**

### ***Significance Criteria***

Appendix G of the CEQA Guidelines contains analysis guidelines related to the assessment of noise impacts. These guidelines have been utilized as thresholds of significance for this analysis. As stated in Appendix G, a project may create a significant environmental impact if one or more of the following occurs:

- ❖ Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- ❖ Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels;
- ❖ A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- ❖ A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- ❖ For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels; and
- ❖ 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.

### **SIGNIFICANCE OF CHANGES IN AMBIENT NOISE LEVELS**

A project is considered to have a significant noise impact where it causes an adopted noise standard to be exceeded for the project site or for adjacent sensitive receptors. In addition to concerns regarding the absolute noise level that might occur when a new source is introduced into an area, it is also important to consider the existing noise environment. If the existing noise environment is quiet and the new noise source greatly increases the noise exposure, even though a criterion level might not be exceeded, an impact may occur. Lacking adopted standards for evaluating such impacts, general considerations for community noise environments are that a

change of over 5 dBA is readily noticeable and, therefore, is considered a significant impact (refer to Table 5.5-6, *SIGNIFICANCE OF CHANGES IN CUMULATIVE NOISE EXPOSURE*). In areas where the ambient noise level without project is between 60 – 65 dBA, some individuals may notice an increase to the ambient noise level of greater than three dBA. Changes in community noise levels by one dBA or more in areas where the ambient noise level is greater than 65 dBA is considered a significant impact because the increase would contribute to an existing noise deficiency.

**Table 5.5-6  
SIGNIFICANCE OF CHANGES IN CUMULATIVE NOISE EXPOSURE**

Ambient Noise Level Without Project (Ldn or CNEL)	Significant Impact Assumed to Occur if the Project Increases Ambient Noise Levels by:
< 60 dBA	+ 5.0 dBA or more
60 - 65 dBA	+3.0 dBA or more
> 65 dBA	+1.0 dBA or more
Sources: FICON, FHWA, and Caltrans as applied by Brown-Buntin Associates, Inc., 1997.	

For a discussion of short-term, construction-related noise impacts, refer to Section 5.9, *CONSTRUCTION RELATED IMPACTS*.

**LONG-TERM STATIONARY SOURCES**

**Proposed Desalination Facility Site**

The proposed project involves the implementation of a 50 mgd desalination facility on a site currently occupied by an existing fuel oil storage tank facility. The project site exists within an industrial area, with the HBGS and Pacific Holdings tank farm located in the project vicinity. The primary noise sources would be the feedwater pump area, water supply pumps, workshop and storage buildings, control room, transformers and power control centers. The pump systems would be the most significant noise source at the subject site. High flow, high-head pumps are typically driven by an electric motor and produce broadband noise without strong tonal components. This noise source is omnidirectional and continuous during facility operation.

A total of 36 large electric water pumps are proposed on-site (33 operating continuously and three standby pumps), the largest of which would be utilized indoors. A total of 12 400-horsepower pumps and 12 3,500 horsepower pumps would be operated indoors (reverse osmosis feed pumps and pretreatment transfer pumps), while four 250-horsepower pumps and five 500-horsepower pumps would be operated outdoors (seawater intake pumps, and product water transfer pumps). All indoor pumps would be fully enclosed within the proposed reverse osmosis building. The amount of noise radiated from the wall surfaces and ventilation system of any given pump housing is controllable over a reasonably wide range. The predicted noise levels of the combined indoor and combined outdoor pump systems is illustrated in Table 5.5-7, *PREDICTED PUMP SYSTEM NOISE LEVELS AT THREE FEET*. These assumed noise levels are for steady-state, base load operations, and exclude startups, shutdowns, and off-normal or emergency conditions.

By accounting for standard attenuation from the pump housing components and the reverse osmosis building, the combined sound levels of the pretreatment transfer and reverse osmosis pumps would be reduced by 20 dBA.<sup>1</sup> Additionally, the outdoor intake and product water pumps would be enclosed in underground vaults. Thus, noise emanating from these devices would be

<sup>1</sup> ANSI S1.31, *Precision Methods for the Determination of Sound Power Levels of Broadband Noise Sources in Reverberation Rooms*.

negligible. Thus, the major source of noise from the project site would be random incident noise (i.e., maintenance activities, worker activities) and noise from the reverse osmosis building. Assuming a worst case scenario of all of the pumps operating at full capacity within the reverse osmosis building with standard attenuation, the combined sound level would be 100.3 dBA at the edge of the building.

**Table 5.5-7  
 PREDICTED PUMP SYSTEM NOISE LEVELS AT THREE FEET**

Condition	250 hp Pump <sup>1</sup>	400 hp Pump <sup>2</sup>	500 hp Pump <sup>3</sup>	3,500 hp Pump <sup>4</sup>	Combined Sound Level <sup>5</sup>
<b>Indoor Pumps (Pretreatment and Reverse Osmosis Pumps)</b>					
# of Pumps in Operation	0	12	0	12	120.3 dBA
<b>Outdoor Pumps (Feedwater and Product Water Pumps)</b>					
# of Pumps in Operation	4	0	5	0	105.3 dBA
<b>Notes:</b>					
1 – Assumes overall sound Power (dB) of 88 dBA at 3 feet.					
2 – Assumes overall sound Power (dB) of 98 dBA at 3 feet.					
3 – Assumes overall sound Power (dB) of 98 dBA at 3 feet.					
4 – Assumes overall sound Power (dB) of 109 dBA at 3 feet.					
5 – Combined sound Level based on the following formula: $dB_c = 10 \log_{10} (10^{(dB_1/10)} + \dots + 10^{(dB_n/10)})$					
<b>Source:</b> L.N. Miller, et. al., <i>Electric Power Plant Environmental Noise Guide</i> , 1984.					

The reverse osmosis building is the on-site facility that could potentially generate the most noise. The noise level at the nearest sensitive receptor to the reverse osmosis building was calculated from each source using the Inverse Square Law of Noise Propagation. Briefly, this formulation states that noise decreases by approximately six dBA with every doubling of the distance from the source. This methodology is an accurate assessment of noise propagation and is represented as:

$$L_2 = L_1 - 20 \log (R_2/R_1)$$

where:

- L<sub>2</sub> = Noise level at a selected distance R<sub>2</sub> from the source.
- L<sub>1</sub> = Noise level measured at a distance R<sub>1</sub> from the source.

Reverse Osmosis Building Noise

- L<sub>1</sub> = 100.3 dBA
- R<sub>1</sub> = three feet
- R<sub>2</sub> = 1,000 feet to nearest residential uses west of the subject site

The nearest residential uses to the reverse osmosis building are approximately 1,000 feet west. Based on the Inverse Square Law of Propagation, the noise levels at this distance would be 49.8 dBA. When accounting for existing intervening structures (power plant facilities, tanks, etc.) and features (berms), the anticipated noise level of 49.8 dBA would be further reduced.

The noise emissions of all major facility components during normal base load operation are typically limited by specifying equipment parameters to the vendors of the allowable sound power levels developed in the noise mode. The method for achieving the level required for each element and its physical details would be developed in parallel with the overall detailed design of the desalination facility. In general, all prepackaged components would be purchased under the condition that the noise limit stated in the technical specification would be met and guaranteed by the manufacturers. Special attention would be given to sources that tend to be tonal in nature to ensure that any tones are sufficiently attenuated. As shown above, noise levels from the desalination facility would not

exceed 50.0 dBA at the nearest residential uses. In addition, prior to construction of the reverse osmosis building, a detailed acoustical analysis would be performed for the project to insure that noise levels at the HBGS property line do not exceed the City's Industrial noise standard of 70.0 dBA. Methods to further reduce noise levels from the reverse osmosis building include double walls, sound absorbing materials, acoustic barriers, sound control curtains, and sound baffles. Therefore, operational noise from the desalination facility would not have a significant impact in this regard.

### Mobile Sources

The proposed project would generate a nominal amount of noise resulting from mobile sources as a result of employee trips and truck-generated traffic. As stated previously, the proposed desalination facility would employ a total of approximately 18 people, with an average of five to seven people on-site per shift on weekdays. In addition, facility operation would require a maximum of four truck trips per day for solid waste disposal and chemical delivery. Noise generated by mobile sources as a result of the proposed desalination facility is anticipated to be less than significant.

### **Off-Site Pipelines and Underground Pump Stations**

#### Proposed Pipeline Alignment

The proposed product water pipelines would occur entirely underground. Upon completion of construction, these pipelines would not generate noise. As such, noise impacts due to long-term pipeline operations would not be significant.

#### OC-44 Booster Pump Station

The OC-44 pumping station is proposed to be located underground within an unincorporated area of the County of Orange, along the eastern border of the City of Newport Beach, approximately 1.5 miles south of the University of California, Irvine. The site is within an Orange County Resource Preservation Easement, but outside of the NCCP/HCP area, approximately 0.5-mile north of the San Joaquin Reservoir, where the East Orange County Feeder Number Two and the OC-44 transmission pipelines converge. The OC-44 underground booster pump station would include pumps, a surge tank to protect the distribution system from sudden pressure changes, telemetry equipment, appurtenances, and three diesel powered electrical generators for emergency back-up purposes. These generators would be Caterpillar Model 3516 units or similar equipment and would supply approximately seven megawatts of emergency power for adequate operation of the pump station (in regards to flow and pressure). These diesel-powered generators would require an 8,700-gallon diesel fuel storage tank (assuming a 24-hour emergency period), with a diameter of eight feet and a depth of 26 feet. The booster pump station would be placed entirely underground to maintain the natural character of the surrounding resource preservation easement.

The pump that would be used is a vertical turbine pump. The pump would be less than 500 hp and produce noise levels of approximately 88 dBA at three feet from the source. As the booster pump would both be located underground and contain an adequate amount of acoustical shielding, it is unlikely to emit noise levels in excess of County of Orange codes. Additionally, as the pumps would be placed underground, the off-site underground booster pump station is not anticipated to adversely affect the NCCP/HCP area along the eastern border of the City of Newport Beach. Impacts in this regard are not anticipated to be significant.

#### Coastal Junction Booster Pump Station

A second underground booster pump station is proposed within the parking lot of St. Paul's Greek Orthodox Church within the City of Irvine, located at 4949 Alton Parkway. The underground pump station would be constructed within the north/northwestern portion of the church parking lot, in an area used for both parking and volleyball activities. The booster pumping station would be placed entirely underground to maintain the appearance and functionality of the existing parking lot.

The underground booster pump station would include pumps, telemetry equipment, appurtenances, and one diesel powered electrical generator for emergency back-up purposes. This generator would be a Caterpillar Model 3516 unit or similar equipment and would supply approximately seven megawatts of emergency power for adequate operation of the pump station (in regards to flow and pressure). This diesel-powered generator would require a 1,300 gallon diesel fuel storage tank (assuming a 24-hour emergency period), with a diameter of six feet and a depth of 15 feet.

Similar to the OC-44 booster pump station, the pump that would be used is a vertical turbine pump. The pump would be less than 500 hp and produce noise levels of approximately 88 dBA at three feet from the source. As the booster pump would both be located underground and contain an adequate amount of acoustical shielding, it is unlikely to emit noise levels in excess of City of Irvine codes. Impacts in this regard are not anticipated to be significant.

## **MITIGATION MEASURES**

### **LONG TERM STATIONARY NOISE SOURCES**

#### **Proposed Desalination Facility Site**

NOI-1 Prior to the issuance of any building or grading permits, the Applicant shall prepare an acoustical analysis report and appropriate plans, prepared under the supervision of a City-approved acoustical consultant, describing the stationary noise generation potential and noise mitigation measures (such as the installation of double walls, sound absorbing materials, acoustic barriers, sound control curtains, and sound baffles), if needed, which shall be included in the plans and specifications of the project. All stationary equipment shall be designed to insure that noise levels at the HBGS property line do not exceed the City's Industrial noise standard of 70.0 dBA and will be subject to the approval of the City of Huntington Beach.

#### **Off-Site Pipelines and Booster Pump Stations**

None required upon compliance with local noise standards.

### **MOBILE SOURCES**

None required.

## **UNAVOIDABLE SIGNIFICANT IMPACTS**

None have been identified.