4.9 NOISE

4.9.1 Description of Resource/Environmental Setting

This section discusses the terms used to describe noise, identifies applicable regulations, describes the existing noise environment in the vicinity of SONGS and analyzes the potential impacts to the noise environment due to the Proposed Project. All disposition activities at the Port of Long Beach would occur at existing permitted facilities with no increase in operations.

Noise is defined as unwanted or objectionable sound. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance and, in the extreme, hearing impairment. The unit of measurement used to describe a noise level is the decibel (dB). Decibels are measured on a logarithmic scale, which quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. Thus, an increase of 3 dB doubles the noise level; a decrease of 3 dB halves the noise level. The human ear is not equally sensitive to all frequencies within the sound spectrum. The "A-weighted" noise scale, which weights the frequencies to which humans are sensitive, is used for measurements. In this report, all noise levels are measured and calculated in A-weighted decibels (dBA). Table 4.9-1 shows the relationship of various noise levels to commonly experienced noise events.

Several metrics have been developed for the analysis of community noise on people. They are designed to account for the known effects of noise on people as described above. Based on these effects, the observation has been made that the potential for noise to affect sensitive receptors is dependent on the total acoustical energy content of the noise. The metrics used in this report include the Equivalent Noise Level (L_{eq}) and the Community Noise Equivalent Level (CNEL).

L_{eq} is the sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period. L_{eq} is the "energy" average noise level. CNEL is similar to L_{eq} but it takes into account differences in intrusiveness between daytime and nighttime noises within a 24-hour period. CNEL values result from the averaging of hourly energy-equivalent sound levels for a 24-hour period, with a weighting factor applied to evening and nighttime L_{eq} values. For CNEL, the evening time period (7:00 p.m. to 10:00 p.m.) penalizes noise 5 dBA, while nighttime (10:00 p.m. to 7:00 a.m.) noise is penalized 10 dBA.

Table 4.9-1. Sound Levels of Typical Noise Sources

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source: Caltrans, Technical Noise Supplement, Traffic Noise Analysis Protocol. October 1998.

Noise levels within the project area are high due to surf noise and onshore noise sources, such as traffic noise and passing trains. The average daily ambient noise levels in the project area, at a similar grade to I-5 and Atchison Topeka Santa Fe Railroad, are between 60 dBA CNEL and 63 dBA CNEL. Areas closer to the beach are generally quieter, with noise levels again increasing closer to the surf line.

Noise receptors in the project area are the users of the recreational beaches to the north and south of SONGS Unit 1. At greater distances are the Bluffs Campground, approximately 0.5 mile (0.8 km) southeast of the site, and the San Mateo Campground, approximately 2.75 miles (4.4 km) northeast of the site.

Noise Level Measurements

Existing noise levels at the project site were observed and measured on Monday, October 25, 2004, between 1:00 p.m. and 1:30 p.m. at two locations. The results of the measurements are shown in Table 4.9-2. Measurement site 1 was located directly over the intake and discharge conduits at the high tide line. Measurement site 2 was located

at Surf Beach, 5 feet (2 m) north of the SONGS Unit 1 fence, at the high tide line. The surf line, the point where the waves were crashing, was located approximately 20 feet (6 m) from both measurement locations. The meter was placed 5 feet (2 m) above the surface grade at both locations. A Larson-Davis Laboratories Model 712 Type 2 sound level meter was used. The meter was calibrated before and after use. The following parameters were used: an A-weighted filter; a slow response; and a 5-minute measurement interval.

Table 4.9-2. Existing Measured Noise Levels

Site ID	Location	Time	Noise Levels dBA		
			L_{eq}	L_{max}	L_{min}
1	SONGS Beach - Directly Over Conduits	13:05 – 13:15	70	85	62
2	San Onofre State Beach (Surf Beach)	13:16 – 13:26	69	85	62

L_{max} – maximum noise level recorded during the period; L_{min} – minimum noise level recorded during the period.

The ocean surf is the dominant noise in the project area. Noise generated by traffic on I-5 and the railroad was not audible at the project site during the noise measurements due to the intervening coastal bluffs.

The sound of the ocean surf can vary depending on the tides and weather conditions. At a point 50 feet (15 m) from the surf line, gentle lapping waves would produce about 20 dBA, while large waves and surf would produce about 55 dBA. For noise assessment purposes, the average level is approximately 40 dBA CNEL under typical weather conditions.

4.9.2 Regulatory Setting

Noise levels in California are regulated through State, county, and municipal standards and regulations. California has required each local government to perform noise studies and implement a Noise Element as part of their General Plan. California Administrative Code, Title 4, has guidelines for evaluating the compatibility of various land uses as a function of community noise exposure.

The majority of the Proposed Project activities would occur offshore to a distance of approximately 3,200 feet (975 m). Some construction for project alternatives would occur on the beach between the surf line and the existing sea wall, an area approximately 75 feet (23 m) wide. Noise levels on the beach and in the immediate vicinity would be regulated by the CSLC or the CDPR. As there would be no long-term

operational noise associated with the Proposed Project, the noise regulations of concern would be related to construction noise.

Neither the CSLC nor the CDPR has specific noise standards or published noise level limits for construction activity for lands within their jurisdictions. The Land Use Compatibility Guidelines included in Title 4 are related to operational noise levels over a 24-hour period and are inappropriate for this project. Therefore, the County of San Diego noise ordinance requirements for construction activities will be used to assess potential impacts on the beach in front of SONGS Unit 1 and at the adjacent San Onofre State Beach (Surf Beach). Section 36.410 of the ordinance limits the hours of construction to Monday through Saturday, 7 a.m. to 7 p.m. and prohibits construction on Sundays and holidays. Section 36.410 also limits construction noise, measured at or within any developed and used residential property, to a maximum of 75 dBA for a period of 8 hours. For the Proposed Project, this noise level limit will be considered applicable to recreation areas.

4.9.3 Significance Criteria

The State CEQA Guidelines indicate that a project would normally have a significant effect on the environment related to noise if it would substantially increase the ambient noise levels for adjoining areas or conflict with adopted environmental plans and goals of the community where it is located. The significance of a noise effect would be evaluated based on compliance with regulations, which would involve: (1) consistency with permissible noise levels on sensitive receptors based on specific land use; (2) permissible changes in noise levels relative to measured baseline levels; and (3) maximum permitted noise levels for a jurisdiction. Noise impacts from the Proposed Project or any of the alternatives would be considered significant if sensitive noise receptors were exposed to project-generated noise that exceeded relevant Federal, State, or local standards or regulations. Noise levels from onshore or offshore disposition activities associated with each alternative would be evaluated to determine whether the activities would exceed noise criteria for recreational activities at nearby state parks on the coast of MCB Camp Pendleton.

The CSLC does not have specific noise standards for construction activity; thus, the following criteria are based on the policies of local jurisdictions and similar environmental evaluations. A project would have a significant impact on noise if it would create one or more of the following:

- construction noise exceeding 75 dBA Leq (hourly average) at any sensitive noise receptor; or

- noise levels that are incompatible with designated land uses.

4.9.4 Impact Analysis and Mitigation

Impact NOI-1: Noise Effects During Operations

Noise could exceed 75 dBA L_{eq} (hourly average) at any sensitive noise receptor (Class III).

Noise impacts from construction are a function of the noise generated by the construction equipment, the location and sensitivity of nearby land uses, and the timing and duration of the noise-generating activities. Noise levels within and adjacent to the specific construction sites would increase during the construction period. Construction would not cause long-term impacts since it would be temporary, and daily construction activities would be limited to hours of less noise sensitivity. No pile driving or explosives blasting would occur as a result of the project; thus, no significant vibrations or groundborne noise would be associated with construction of the Proposed Project (Class III). No mitigation is required.

In general, construction activities would be carried out in phases, and each phase would have its own noise characteristics based on the mix of construction equipment in use. Typical maximum and muffled noise levels at a distance of 50 feet (15 m) from the noise source for various pieces of construction equipment are shown in Table 4.9-3. Even though the noise levels in the table represent typical values, there can be wide fluctuations in the noise emissions of similar equipment.

The Proposed Project would involve the removal and disposition of the manhole risers and terminal structures on the intake and discharge conduits for SONGS Unit 1. These operations would occur in three separate environments: onshore, nearshore, and offshore. The onshore environment includes portions of the SONGS facility and the beach southwest of the SONGS facility. For the Proposed Project, the nearshore environment is characterized by water depth of less than 15 feet (4.6 m), which consists of the area extending westward approximately 1,800 feet (550 m) from the MLLW line. Water depths greater than 15 feet (4.6 m) characterize the offshore environment.

Onshore activity would involve plugging the conduits from the SONGS tsunami gates to the MLLW line, which is approximately 65 feet (20 m) in length. The conduit has an interior diameter of approximately 12 feet (3.7 m), and given the length of the conduit to be plugged, would require approximately 280 CY (214 m^3) of cement to complete the

Table 4.9-3. Demolition and Construction Equipment Noise Levels

Equipment Type[(1)]	Typical Equipment at 50 ft. (in dBA)	Muffled Equipment at 50 ft. (in dBA)
Air Compressor	81	71
Backhoe	85	80
Concrete Pump	82	80
Concrete Vibrator	76	70
Concrete Breaker	82	75
Truck Crane	88	80
Dozer	87	83
Generator	78	71
Loader	84	80
Paver	88	80
Pile Driver	90	80
Pneumatic Tools	85	75
Water Pump	76	71
Power Hand Saw	78	70
Shovel	82	80
Trucks	88	83

Notes:
(1) Muffled equipment can be designed with enclosures, mufflers, or other noise-reducing features.
Source: Bolt, Beranek, and Newman 1971.

plug for each conduit. Construction work in the onshore environment would only involve the use of terrestrial equipment, which would access the project site via existing paved roadways and the SONGS facility. The onshore work area is located approximately 1,500 feet (457 m) from Surf Beach, north of the Proposed Project site. The SONGS beach area is restricted, and it is only used to access the State beaches north and south of the SONGS facility. There are no areas of frequent or long-term recreational activities on the SONGS beach; thus, there are no noise sensitive areas or uses on the beach in front of SONGS Unit 1.

Table 4.9-4 presents equipment and associated noise levels at various distances from equipment required to complete the onshore and nearshore work. It should be noted that this does not represent every piece of equipment that would be used but rather represents the noisiest phase of the operations, which would include the plugging operation and operation of the beach winch and dozer for the nearshore work. Noise levels at 50 feet (15 m) presented in Table 4.9-4 are hourly averages and include

adjustments based on the average time these pieces of equipment typically operate at full power and may differ from the values presented in Table 4.9-3. Additionally, noise levels at 1,500 feet (457 m), shown in Table 4.9-3, reflect an acoustically soft site, which is appropriate as the onshore area is predominately beach sand.

Table 4.9-4. Onshore Construction Noise

Equipment	Noise Level, dBA L_{eq}	
	@ 50 feet	@ 1,500 feet
Rough Terrain Crane	77	38
Diving Air Compressor	76	39
Cement Pump	75	36
10 CY Cement Trucks	81	44
120 bbl Vacuum Truck	87	50
Dozer	81	42
Beach Winch	81	42
Composite Noise Level	*90*	*52*

Sensitive noise receptors that could potentially be affected by disposition activities would be associated with recreational activities at Surf Beach to the north of the project site. As indicated previously, the nearest potential location for recreational activities on Surf Beach is approximately 1,500 feet (457 m) from the disposition sites. The terrain between the disposition sites and Surf Beach is considered acoustically soft, which typically attenuates noise a rate of 7.5 dBA per doubling of distance. At 1,500 feet (457 m) from disposition activities, average hourly noise levels from construction equipment would be approximately 52 dBA L_{eq} and would not exceed the applicable threshold of 75 dBA L_{eq} for construction noise. Additionally, based on the noise measurements taken October 25, 2004, the noise levels associated with disposition activities would be less than the ambient noise level in the project area and would alter the existing ambient noise level by less than 0.1 dBA.

Noise sources associated with the offshore disposition of the manhole risers and the terminal structures would be located on the crane barge, support tugboat, or crew boat. The majority of these sources would be located on the crane barge and the nearest these sources would be to Surf Beach would be approximately 2,400 feet (732 m) during the launching of the SSV and the dispositioning of I-3 and D-3. Water is not considered an acoustically soft medium and noise levels from these sources would attenuate at approximately 6 dBA per doubling of distance.

Noise generated during the offshore removal of the manhole risers and the terminal structures would be slightly greater than noise generated during the onshore and nearshore activities. At 2,400 feet (732 m), noise levels would be approximately 57 dBA L_{eq}, which would not exceed the applicable thresholds and would alter the existing ambient noise level less than 0.2 dBA.

As shown in the preceding analysis, activities would not result in an exceedance of applicable thresholds nor would these activities significantly alter ambient noise levels. Therefore, the Proposed Project would not result in a significant noise-related impact (Class III). No mitigation is required.

Impact NOI-2: Noise Compatibility

The Proposed Project could generate noise levels that would be incompatible with designated land uses (Class III)

The CSLC does not specify land use compatibility noise levels; however, the Governor's Office of Planning and Research has identified general land use compatibility guidelines in its General Plan Guidelines. According to these guidelines, a noise level of 75 dBA CNEL is considered acceptable for water recreation land uses (OPR 2003).

There are no operational noise sources associated with the Proposed Project. The only noise sources associated with the Proposed Project are construction related. As shown in the previous analysis of construction noise, IMPACT NOI-1, noise levels from construction activities would not exceed the applicable significance thresholds at the nearest noise sensitive receptor. Therefore, the Proposed Project would not create noise levels, or cause noise sensitive receptors to be exposed to noise levels, that would be incompatible with the recreational activities associated with Surf Beach (Class III). No mitigation is required.

Table 4.9-5 summarizes the noise impacts and mitigation measures.

Table 4.9-5. Summary of Noise Impacts and Mitigation Measures

Impact	Mitigation Measures
NOI-1: Construction noise exceeding 75 dBA L_{eq} (hourly average) at any sensitive noise receptor	No mitigation required
NOI-2: Creation of noise levels that would be incompatible with designated land uses.	No mitigation required

4.9.5 Alternatives

4.9.5.1 Complete Removal of Conduits Alternative

The onshore portion of this work would require as much as 2 acres (0.8 ha) of beachfront for construction staging and materials storage. The 300-foot-long (91-m) trestle required for removing the conduits would involve sheet-pile barriers extending 400 feet (122 m) from the beach along the north and south perimeters of the conduits.

The complete excavation, removal, and disposition of the entire SONGS Unit 1 cooling water system (all structures, foundations, and other components) would have a slightly greater noise impact than would the Proposed Project. This is due to the logarithmic function of noise. As more pieces of equipment are added to a construction site, the individual effect that each piece of equipment would have on the noise generated diminishes, unless the new equipment is substantially louder than the other equipment.

NOI-ALT-1: Noise Effects During Disposition

The Complete Removal Alternative could exceed 75 dBA L_{eq} at sensitive noise receptor locations (Class III)

The additional equipment associated with the placement of the trestle and barriers, dredging of the seabed, and removal of the conduits would increase noise levels by approximately 2 to 3 dBA L_{eq} over noise levels evaluated for the Proposed Project. While the additional truck trips required for importing and exporting material would represent new noise sources beyond those analyzed for the Proposed Project, these vehicles would represent a minor fraction of the total volume of traffic on transportation routes, such as I-5, and would not be anticipated to increase noise levels by a noticeable amount. Thus, the noise that would occur during the Complete Removal Alternative would not exceed applicable thresholds, nor subject noise sensitive land uses to incompatible noise levels (Class III). No mitigation is required.

4.9.5.2 Removal of Nearshore Components Alternative

Similar to the onshore portion of the Complete Removal Alternative described in Section 3.3.2, this alternative would involve essentially the same scope of work, and impacts within the shoreline and nearshore areas would be identical as those discussed under the Complete Removal Alternative.

NOI-ALT-2: Noise Effects During Operations

The Removal of Nearshore Components Alternative could exceed 75 dBA L_{eq} at sensitive receptor locations (Class III).

Offshore impacts would be less than analyzed in the Proposed Project or the Complete Removal Alternative, as a majority of the structures would remain intact beyond approximately 300 feet (91 m). While there would be a reduction in the equipment requirements and effort in the offshore area, as compared to the Proposed Project, this would be offset by the additional equipment and additional effort required in the onshore and nearshore areas. As discussed under the Complete Removal Alternative, the addition of equipment would not substantially increase noise levels over those analyzed for the Proposed Project. As this alternative would require similar onshore and nearshore equipment and activities as those discussed under the Complete Removal Alternative, this alternative would result in less than significant noise-related impacts (Class III). No mitigation is required.

4.9.5.3 Crush Conduits and Remove Terminal Structures Alternative

The excavation and exposure of the conduits under this alternative would be identical to the onshore portion of the Complete Removal Alternative; however, the conduits would be crushed in place. This effort would employ a drop chisel-shaft to crush the conduits. The onshore and nearshore conduits would be exposed and crushed by a crane using the trestle described in the Complete Removal Alternative, while the offshore conduits would be exposed by dredging and then crushed by a crane onboard a crane barge. The conduit rubble would remain in place, with the onshore portions being buried by new fill material and the offshore conduits eventually being buried over time by migrating sediments transported by local currents.

NOI-ALT-3: Noise Effects During Operations

The Crush Conduits Alternative could exceed 75 dBA L_{eq} at sensitive receptor locations (Class III).

This alternative would cause greater noise- and vibration-related impacts than any other alternative. The primary noise source of concern would be the chisel-shaft dropping, which would generate noise and vibration similar to that of pile driving. Noise levels from pile driving could increase noise levels at Surf Beach by 5 dBA L_{eq} over the noise levels identified for the Complete Removal Alternative. These noise levels would still remain below significance levels, and the vibration would not cause any significant

impacts to structures or to people recreating in the area (Class III). No mitigation is required.

4.9.5.4 Artificial Reef Alternative

The Artificial Reef Alternative reflects several components of the Proposed Project; it would involve only dismantling the terminal structures down to the seafloor and placing a steel grill over the opening. The concrete sections would remain permanently on the seafloor around the existing rock riprap, creating an artificial reef, or the concrete sections could be removed and placed at another artificial reef in nearby coastal waters as an option.

NOI-ALT-4: Noise Effects During Operations

The Artificial Reef Alternative could exceed 75 dBA L_{eq} at sensitive receptor locations (Class III).

Under this habitat-enhancement alternative, the need for dredging would be eliminated, the manhole risers would be left undisturbed, the marker buoys and anchors would be removed, and the onshore portions of the conduits would not be plugged.

In terms of noise impact assessment, this alternative would generate the fewest noise impacts, other than the No Project Alternative. It is anticipated that noise generated during the removal of the terminal structures would be similar, albeit for a shorter period, to offshore work under the Proposed Project and would not exceed applicable significance thresholds or expose people recreating in the area to unacceptable noise levels (Class III). No mitigation is required.

4.9.5.5 No Project Alternative

The No Project alternative would retain the intake and discharge conduits in their present condition and would not result in the generation of noise associated with the dispositioning of the conduits.

4.9.6 Cumulative Project Impact Analysis

The following discussion analyzes the contribution of the Proposed Project to cumulative effects on the noise environment in the project area. The decommissioning activities for the Proposed Project would generate noise both onshore and offshore. However, no other past, present, or reasonably foreseeable projects have been identified for the offshore area near the terminal structures or onshore within 0.5 miles (0.8 km) of the project site. Due to these distances, and the ambient noise levels in the

project area, noise from these other projects would not affect the noise environment at the project site or at surrounding land uses. Therefore, the Proposed Project, in conjunction with other known projects, would not contribute to significant cumulative noise impacts.

4.9.7 References

Bolt, Beranek, and Newman. 1971. *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances*, December 31.

California Department of Transportation (Caltrans). 1998. *Traffic Noise Analysis Protocol for New Highway and Reconstruction Projects*, including Technical Noise Supplement. October.

State of California, Governor's Office of Planning and Research (OPR). 2003. *General Plan Guidelines*, October.