CHAPTER 17
NOISE

This chapter describes noise in the study area and potential changes that could occur due to implementation of the alternatives. Noise is defined as unwanted sound. Noise usually is objectionable because it is disturbing or annoying due to its pitch or loudness. Pitch is frequency of a tone or sound. The human ear does not hear all frequencies equally. In particular, the ear de-emphasizes low and very high frequencies. Loudness is intensity of sound waves combined with the reception characteristics of the ear.

A decibel (dB) is a unit of measurement that is used to indicate the relative amplitude of a sound. Sound levels in decibels are calculated on a logarithmic scale. Subjectively, each 10-dB increase in sound level is generally perceived as a doubling of loudness. Human ears do not respond consistently across a frequency range that can be heard. Generally, human ears do not respond well to very low and very high frequencies. To more accurately represent the response of a human ear, sound meters include filters. Most sound measurements are conducted using a sound filter referred to as the "A scale." Therefore, the measurements are reported as "dBA."

Because sound levels can vary over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy equivalent sound/noise descriptor is called equivalent noise level (L_{eq}). The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration. Table 17-1 shows typical A-weighted noise levels measured in the environment.

Table 17-1
Typical Sound Levels Measured in the Environment and Industry

Sound Level (dBA)	Potential Source or Human Perception of Sound
130 - 140	Pain threshold
120	Jet takeoff (200 feet)
110	Chainsaw (2 feet) or amplified music concert
100	Pile driver (50 feet)
90	Power mower or heavy truck (50 feet) Hearing damage can occur at exposures of 8 hours
60	Air conditioner unit Requires loud speech at 3 feet
50	Light auto traffic (100 feet) or quiet office Requires normal speech at 3 feet
40	Bird calls or library Soft whisper (6 feet)
0	Threshold of hearing

Source: County of Imperial, 1997a

Because sensitivity to noise increases during the evening and at night when excessive noise interferes with the ability to sleep, 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The Community Noise Equivalent Level (CNEL) is a measure of the cumulative noise exposure in a community with about 5 dBA penalty added to evening (7:00 pm to 10:00 pm) and a 10 dBA addition to nocturnal (10:00 pm to 7:00 am) noise levels. The day/night average sound level (L_{dn}) is essentially the same as CNEL, without applying any penalty to noise events occurring in the evening time period.

Noise changes both in level and frequency spectrums as it travels from the source to the receiver. The most obvious is the decrease in noise as the distance from the source increases. The manner in which noise is reduced depends on a variety of factors, including the noise source type as well as the region over which the noise source propagates. Noise generated by a point source, such as equipment at a construction site, drops off at a rate of 6 dBA per doubling of distance. Traffic noise attenuates, or is reduced, at a different rate. The movement of vehicles makes the noise source appear to emanate from a line as opposed to a single point when viewed over a period of time. Noise levels drop off at a rate of about 3 dBA per doubling of distance for this type of source. However, ground type also plays into how much of a drop off over distance will occur. Surfaces, such as soft dirt or grass, absorb some of the sound energy as the sound passes over. Hard surfaces such as parking lots or bodies of water do not have this absorption.

STUDY AREA

The study area is defined as the geographical area within which the large majority of potential impacts are expected. The study area for noise includes the communities near the Salton Sea, as shown on Figure 1-1. The study are includes the major roads in the vicinity that could be used by trucks to carry construction materials within Imperial and Coachella valleys (State Highways 78, 86, and 111). Interstate 10 is not included in the noise analysis because the traffic volumes are already so great that the number of truck trips that could be added would not affect the noise levels in the surrounding area.

REGULATORY REQUIREMENTS

The State of California has not adopted quantitative noise regulations that are applicable to the alternatives. Each city and county in the study area is required to adopt a Noise Element as part of its General Plan that is intended to ensure that land uses are compatible with the ambient noise levels, and each also may have zoning or noise ordinances outlining acceptable noise levels for various land uses during construction and operations. For the Draft Programmatic Environmental Impact Report (PEIR), the noise standards that are most applicable to the alternatives are those of Imperial and Riverside counties, because construction at the Salton Sea and transportation of materials and workers in the alternatives could affect receptors in those counties.

Imperial County Noise Standards

The primary regulatory documents that establish noise standards in Imperial County are the Noise Element of the Imperial County General Plan and the Imperial County Noise Abatement and Control Ordinance. Relevant standards from both documents are discussed below by type of standard (e.g., for construction noise or operation noise).

Sensitive Receptors

As defined in the Noise Element, sensitive noise receptors generally are areas of habitation where the intrusion of noise has the potential to adversely affect the occupancy, use, or enjoyment of the environment. Sensitive receptors include, but are not limited to, residences, schools, hospitals, parks, and office buildings. The Noise Element also indicates that sensitive receptors may be non-human species, such as riparian birds. Impacts to biological resources from noise are addressed in Chapter 8.

Construction Noise

The Noise Element limits sound levels from construction activities during specific hours of the day and night through a set of construction noise standards, presented below in Table 17-2 (County of Imperial, 1997a). The standards apply to the noise measured at the nearest sensitive receptor. Imperial County does not have construction standards for vibration.

Table 17-2
Construction Noise Standards, County of Imperial

Duration of Construction	Noise Source	Sound Level (dBA L_{eq})[a]	Period of Averaging (hours)	Restricted Hours of Operation
Short term (days or weeks)	Single piece of construction equipment	75	8	7 am to 7 pm Monday-Friday 9 am to 5 pm Saturday No commercial construction operation is permitted on Sundays and holidays.
Short term (days or weeks)	Combination of pieces of construction equipment	75	8	7 am to 7 pm Monday-Friday 9 am to 5 pm Saturday No commercial construction operation is permitted on Sundays and holidays.
Extended term[b]	Single piece of construction equipment	75	1	7 am to 7 pm Monday-Friday 9 am to 5 pm Saturday No commercial construction operation is permitted on Sundays and holidays.
Extended term[b]	Combination of pieces of construction equipment	75	1	7 am to 7 pm Monday-Friday 9 am to 5 pm Saturday No commercial construction operation is permitted on Sundays and holidays.

Source: County of Imperial, 1997a

[a] As measured at the nearest sensitive receptor.

[b] The standards assume a construction period, relative to an individual sensitive receptor, of days or weeks. The standard can be made more restrictive in cases of extended-length construction times.

Operation Noise

Imperial County's noise and land use compatibility guidelines identified in the Noise Element are shown in Table 17-3. These guidelines are to be used to evaluate noise impacts of proposed actions.

The Noise Element also includes Property Line Noise Limits that apply to noise generation from one property to an adjacent property, as listed in Table 17-4 (County of Imperial, 1997a). The standards imply the existence of a sensitive receptor on the adjacent, or receiving, property. In the absence of a sensitive receptor, an exception or variance to the standards may be appropriate. An analysis is required for any action that has the potential to generate noise in excess of the Property Line Noise Limits. The Imperial County Noise Abatement and Control Ordinance also includes property line noise limits that are consistent with those listed below.

The Noise Element also defines a Noise Impact Zone as an area that is likely to be exposed to significant noise. The County of Imperial defines a Noise Impact Zone as an area that may be exposed to noise greater than 60 dBA CNEL or 75 dBA Leq (averaged over one hour). The purpose of the Noise Impact Zone is to define areas and properties where an acoustical analysis of a proposed action is required to demonstrate compliance with land use compatibility requirements and other applicable environmental noise standards. Any property within 1,500 feet of an interstate highway or 1,100 feet of a state highway is within a Noise Impact Zone, as is any property within one-quarter mile (1,320 feet) of existing farmland that is in an agricultural zone.

Table 17-3
Imperial County Noise/Land Use Compatibility Guidelines

Land Use Category	Compatible Sound Levels with Land Use Categories			
	55dBA	**60 dBA**	**70 dBA**	**80 dBA**
Residential	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Transient Lodging-Motels, Hotels	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Schools, Libraries, Churches, Hospitals, Nursing Homes	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Auditoriums, Concert Halls, Amphitheaters	Conditionally Acceptable		Not Acceptable	
Sports Arena, Outdoor Spectator Sports	Conditionally Acceptable		Normally Unacceptable	Clearly Unacceptable
Playgrounds, Neighborhood Parks	Normally Acceptable		Normally Unacceptable	Clearly Unacceptable
Gold Courses Riding Stables, Water Recreation, Cemeteries	Normally Acceptable		Normally Unacceptable	Clearly Unacceptable
Office Buildings, Business Commercial and Professional	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Industrial, Manufacturing Utilities, Agriculture	Normally Acceptable		Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable

Notes: Imperial County, 1997a

Normally Acceptable: Specified land use is satisfactory 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.

Normally Unacceptable: New construction or development should be discouraged.

Clearly Unacceptable: New construction or development clearly should not be undertaken.

Table 17-4
Operation Noise Standards, County of Imperial

Land Use Zone	Time	Applicable Limit 1-hour Average Sound Level (dBA)
Residential Zones	7 am to 10 pm	50
	10 pm to 7 am	45
Multi-residential Zones	7 am to 10 pm	55
	10 pm to 7 am	50
Commercial Zone	7 am to 10 pm	60
	10 pm to 7 am	55
Light Industrial/Industrial Park Zones	Anytime	70
General Industrial Zones (including agriculture operations)	Anytime	75

Source: County of Imperial, 1997a.

Note: When the noise-generating property and the receiving property have different uses, the more restrictive standard shall apply. When the ambient noise level is equal to or exceeds the Property Line noise standard, the increase of the existing or proposed noise shall not exceed 3 dBA L_{eq}.

An acoustical analysis is required for any action that would be located, all or in part, in a Noise Impact Zone. According to the Noise Element, if the future noise levels from the action are within the normally acceptable noise level guideline, but result in an increase of 5 dBA CNEL or greater, the action would have a potentially significant noise impact, and mitigation measures must be considered. If the future noise level after the action is completed is greater than the normally acceptable noise level, a noise increase of 3 dBA CNEL or greater should be considered a potentially significant noise impact and mitigation measures must be considered.

Riverside County Noise Standards

The primary regulatory document that establishes noise standards in Riverside County is the Noise Element of the County of Riverside General Plan. Relevant standards from this document are discussed below by type of standard (e.g., for construction noise or operation noise).

Sensitive Receptors

Sensitive receptors mentioned in the Noise Element of the County of Riverside General Plan include, but are not limited to, schools, hospitals, rest homes, long term care facilities, hospitals, residences, places of worship, libraries, and passive recreation areas (County of Riverside, 2003c). The Noise Element discourages construction of the sensitive receptors listed above in areas in excess of 65 CNEL and contains policies that protect noise sensitive land uses from noise emitted by outside sources and prevent new actions from generating adverse noise levels on adjacent properties. The Noise Element also considers the following land uses sensitive to vibration: hospitals, residential areas, concert halls, libraries, sensitive research operations, schools, and offices.

Construction Noise

Construction noise standards for Riverside County are found in Title 15.04.020 of the Riverside County Code. The Riverside County Code does not provide construction noise limits. However, it does restrict construction activities within one-quarter mile of an occupied residence(s) to the hours of 6 am to 6 pm during the months of June through September. During the months of October through May, such construction activities are restricted to the hours of 7 a.m. to 6 p.m. Exceptions to these standards are developed with the consent of a County building official.

Operation Noise

According to the Riverside County Department of Public Health, Office of Industrial Hygiene (Uhlman, 2004a), noise from a stationary source, "as projected to any portion of any surrounding property containing a habitable dwelling, hospital, school, library, or nursing home," must not exceed the following worst-case noise levels:

- 45 dBA 10-minute L_{eq} between 10 pm and 7 am (nighttime standard); and
- 65 dBA 10-minute L_{eq} between 7 am and 10 pm (daytime standard)

Noise standards for traffic noise are as follows (Uhlman, 2004b):

- The interior noise levels in residential dwellings shall not exceed 45 Ldn/CNEL; and
- The exterior noise level shall not exceed 65 Ldn/CNEL

Vibration

The Noise Element contains Policy N 15.3: Prohibit exposure of residential dwellings to perceptible ground vibration from passing trains as perceived at the ground or second floor. Perceptible motion shall be presumed to be a motion velocity of 0.01 inches/second over a range of 1 to 100 Hertz.

HISTORICAL PERSPECTIVE

Noise in the area surrounding the Salton Sea is generated by a variety of sources, including rail and vehicular traffic, aircraft, agricultural activities, and urban uses. Beginning in the 1950s, recreational boating was a source of noise, but this activity has virtually ceased. As the amount of vehicular and air traffic in the study area has increased, noise generated by these activities has increased. As areas have become more urbanized, the amount of noise generated by typical urban activities, including construction has increased.

DATA SOURCES

Information regarding the existing noise environment and regulatory setting was obtained from the general plans developed by Imperial and Riverside counties and plans developed by Riverside County Department of Public Health, Office of Industrial Hygiene. Caltrans traffic counts were the basis for the estimate of traffic noise along major roadways in the study area. Information regarding construction noise was obtained from the U.S. Environmental Protection Agency (USEPA).

DATA LIMITATIONS

Given the programmatic nature of this analysis, the precise mix of construction equipment that would be used and the timing and duration of the construction of individual components is not known, nor is the exact location of individual components or whether they would be in proximity to noise sensitive receptors. The amount of noise that would be generated in the future by individual pieces of construction equipment, pumps, treatment facilities, and other elements is not known. Similarly, the cumulative noise generation of the various sources is unknown. No noise measurements were taken at the Salton Sea, and existing noise levels generated by vehicular traffic and rail traffic are based on information that is several years old. Traffic may have increased since the counts were taken.

EXISTING CONDITIONS

The information in this section is based upon the most current information available related to existing noise sources and sensitive receptors.

Noise Sources

A primary source of noise in the study area is vehicular traffic along the major roads, although noise also is generated by activities such as rail traffic, aircraft operations, agricultural activities, geothermal hydroelectric facilities, and urban activities. This discussion focuses on the most common substantial sources of noise.

Vehicle noise is a combination of the noises produced by the engine, exhaust, and tires. The loudness of traffic noise can also be increased by defective mufflers or other faulty equipment on vehicles. Any condition (such as a steep incline) that causes heavy laboring of motor vehicle engines will also increase traffic noise levels. In addition, there are other, more complicated factors that affect the loudness of traffic noise. For example, as a person moves away from a highway, traffic noise levels are reduced by distance, terrain, vegetation, and natural and constructed obstacles.

Interstate 8 and State Highways 78, 86, and 111 are the main sources of vehicular noise in the study area. Hourly average noise levels at 50 feet and 950 feet from the centerline of these roadways at representative locations within the study area, along with peak hour traffic volumes and numbers of each vehicle type are presented in Table 17-5. Noise was estimated using the Federal Highway Administration's Traffic Noise Model Version 2.5 Look-Up Tables, based on the assumption that vehicles traveled at the posted speed limit.

Table 17-5
Noise Levels at Selected Locations along Key Roadways

County	Location	Average Daily Traffic	Peak-Hour Traffic	Number of Vehicles			dBA at 50 feet (Leq)	dBA at 950 feet (Leq)
				Auto	Medium Truck	Heavy Truck		
Interstate 8								
Imperial	Mountain Springs Road	14,700	1,250	1,065	48	137	76	61
Imperial	El Centro, Junction Route 86, 4th Street	32,000	4,400	3,885	133	381	81	66
Imperial	Junction Route 111	34,000	3,400	3,026	102	284	80	65
Imperial	Junction Route 115 North	10,800	1,100	770	88	242	76	62
Imperial	East Junction Route 98 West, Midway Wells	11,500	1,500	1,102	102	296	78	63
Imperial	Arizona State Line	14,800	1,900	1,539	94	266	78	63
State Highway 78								
Imperial	Brawley, Third Street	20,600	1,750	1,663	56	35	71	56
Imperial	Brawley, West Junction Route 111, Eighth/Main Streets	19,000	1,600	1,488	61	48	71	56
Imperial	East Junction Route 115	3,100	320	221	24	77	71	56
Imperial	Palo Verde, Fourth/Main Streets	2,250	540	470	11	46	71	56
Riverside	Junction Route 10	3,000	290	272	‹1	15	67	52
State Highway 86								
Imperial	El Centro, Junction Route 8	20,500	1,850	1,739	77	34	71	57
Imperial	Brawley, South	12,100	1,150	1,035	46	69	71	56

Table 17-5
Noise Levels at Selected Locations along Key Roadways

County	Location	Average Daily Traffic	Peak-Hour Traffic	Number of Vehicles			dBA at 50 feet (Leq)	dBA at 950 feet (Leq)
				Auto	Medium Truck	Heavy Truck		
	Junction Route 78							
Imperial	North Junction Route 78	11,500	1,200	924	46	228	73	59
Riverside	Junction Route 195 North	11,600	900	747	49	108	71	56
Riverside	Coachella, South Junction Route 111	18,800	1,600	1,264	93	240	74	59
State Highway 111								
Imperial	Calexico, Second Street	43,500	3,350	3,216	67	67	78	63
Imperial	Junction Route 86 West, Heber Road	34,000	2,400	2,208	106	96	76	62
Imperial	Junction Route 8	37,000	3,650	3,395	135	110	78	63
Imperial	Brawley, East Junction Route 78	7,500	540	405	22	113	72	58
Imperial	Calipatria, Junction Route 115 East	6,300	660	521	49	92	73	58
Imperial	Niland, Niland Avenue	5,100	540	443	42	54	75	61
Imperial	Imperial-Riverside County Line	3,000	280	199	34	48	69	55
Riverside	Coachella, South Junction Route 86	11,000	1,100	968	101	33	73	58

Source: Caltrans, 2005a and 2005b; Federal Highway Administration Traffic Noise Model Version 2.5 Look-Up Tables.
Note: Vehicle trips may not equal peak hour traffic due to rounding.

The Union Pacific Railroad maintains a rail line along the eastern side of the Salton Sea that carries up to 70 trains/day (Lucas, 2005). Virtually all of these are intermodal trains, which move rapidly between Los Angeles and El Paso, Texas and constitute the primary source of rail traffic noise. The County of Riverside (2003c) has documented existing railroad noise contours north of Palm Desert, as presented in Table 17-6. Spur tracks generate much less noise than main rail lines because they are not as heavily traveled.

Table 17-6
Existing Railroad Noise Levels

	Distance from Railroad Tracks to Receptor (feet)			
	135	**287**	**645**	**1,929**
dBA at Receptor	75	70	65	60

Source: County of Riverside, 2003c

Airports that provide passenger service near the Salton Sea are Imperial County Airport, San Diego International Airport, Palm Springs International Airport, and Ontario International Airport. Additionally, smaller general aviation airports are in the communities surrounding the Salton Sea, including Brawley, Calexico, Chiriaco Summit, Calipatria, Desert Center, Imperial, Palm Springs, and Salton City. Noise impacts are concentrated in the areas surrounding the airports, but overflights, including those of crop dusting planes, occur throughout the study area and constitute a periodic noise source. The Salton Sea is

not located within the boundaries of any Airport Land Use Compatibility Plans or within 2 miles of an airport or air strip.

Noise sources associated with agricultural operations include the field machinery, especially diesel engine driven heavy trucks used for the delivery of supplies and the distribution of products, aircraft used for the spraying of crops, and pumps.

Sensitive Receptors

Sensitive receptors include residences, schools, hospitals, wildlife refuges, and parks in the incorporated and unincorporated communities in the study area. The agricultural areas and open space do not contain sensitive receptors except for wildlife. Sensitive receptors considered in this analysis are located in the urban areas and rural residential communities

ENVIRONMENTAL IMPACTS

Analysis Methodology

The analysis of noise is focused on noises related to use of equipment for construction and operations and changes in traffic related to each alternative. The general types of equipment that could be used during construction and operations and maintenance were identified, and information developed by the USEPA regarding construction noise levels was used to determine whether noise sensitive receptors could be exposed to noise that would be in excess of regulatory thresholds or that would substantially exceed current conditions.

Significance Criteria

The following significance criteria were based on CEQA and air quality regulatory agency guidance and used to determine if changes as compared to Existing Conditions and the No Action Alternative would:

- Expose people to or generate noise levels in excess of standards established in the local General Plan or Noise Ordinance, or applicable standards of other agencies; or temporary or periodic increase in ambient noise levels in the vicinity above existing levels; and
- Expose people to or generate excessive ground-borne vibration or noise levels.

Application of Significance Criteria

Significance criteria have been applied to the alternatives considered in the PEIR. The following list summarizes the overall methodology in the application of the criteria to the alternatives:

- **Exposure of People to or generate noise levels in excess of standards –** The most severe risks to people would be associated traffic noises during construction, especially related to transport of rock and gravel on the roads and pile driving during the peak construction period; and
- **Exposure of People to or generate excessive ground-borne vibrations or noise levels –** The most severe risks to people would be associated with pile driving that could occur at any building, such as a pumping plant or hydraulic control structure.

Summary of Assumptions

The assumptions related to the descriptions of the alternatives are described in Chapter 3. Specific assumptions related to the analysis of noise are summarized in Table 17-7.

Table 17-7
Summary of Assumptions for Noise

Assumptions Common to All Alternatives	
1. Construction equipment, pumps, and other facilities would use the same technology throughout the study period, and thus projected noise generation by equipment type would remain constant.	
2. Half of the construction vehicles required to implement alternatives would access the Salton Sea from State Highway 86 and half from State Highway 111.	
Assumptions Specific to the Alternatives	
No Action Alternative and Alternatives 1, 2, 3, 4, 5, 6, 7, and 8	No additional assumptions were made.

Specific quarry locations and transportation routes are not known, nor is the method of transporting quarried rock. It is assumed that half of the vehicular traffic generated by alternatives would access the Salton Sea from State Highway 86 and half from State Highway 111. Estimated peak and non-peak truck traffic trips to transport rock and gravel are in Chapter 3. Most of the truck traffic would be involved in transporting rock and gravel; the amount of truck traffic required to deliver other construction materials would be incidental in comparison.

Noise levels of typical equipment expected to be used during construction and operations and maintenance activities, both with and without noise controls, are presented in Table 17-8. Additionally, dredges and tugboats would be used. The noise levels would depend upon the specific equipment used, but noise from diesel powered dredges and tugboats is similar to the earth moving or materials handling equipment because they both use similar size diesel engines. It is assumed that diesel powered dredges typically generate about 85 to 87 dBA at 50 feet, and tugboats generate about 87 dBA.

Table 17-8
Noise Levels and Abatement Potential of Construction Equipment Noise

Equipment	Noise Level at 50 Feet		Noise Level at 100 Feet	
	Without Controls	With Controls*	Without Controls	With Controls*
	dBA			
Earthmoving				
Front Loaders	79	75	73	69
Backhoes	85	75	79	69
Dozers	80	75	74	69
Tractors	80	75	74	69
Graders	85	75	79	69
Pavers	89	80	83	74
Trucks	82	75	76	69
Materials Handling				
Concrete Mixers	85	75	79	69
Concrete Pump	82	75	76	69
Crane	83	75	77	69
Concrete Crushers	85	75	79	69
Stationary				
Pumps	76	75	70	69

Table 17-8
Noise Levels and Abatement Potential of Construction Equipment Noise

Equipment	Noise Level at 50 Feet		Noise Level at 100 Feet	
	Without Controls	With Controls*	Without Controls	With Controls*
Generator	78	75	72	69
Compressors	81	75	75	69
Impact				
Jack Hammers	88	75	82	69
Pneumatic Tools	86	80	80	74
Other				
Saws	78	75	72	69
Vibrators	76	75	70	69

Source: USEPA, 1971

* Noise levels that can be achieved with implementation of feasible noise controls. Feasible noise controls include selecting quieter procedures or machines and implementing noise-control features requiring no major redesign or extreme cost (e.g., improved mufflers, equipment redesign, use of silencers, shields, shrouds, ducts, and engine enclosures).

Not all equipment would be used for all phases of construction, and not all would operate at peak capacity concurrently. In addition, the location of the construction in relation to surrounding sensitive receptors would affect the magnitude of the noise impact. USEPA (1971) estimated that construction of public works projects, including roads, typically generates an average of between 78 and 88 dBA depending on the construction phase and the amount of equipment being used. Assuming construction noise of 78 to 88 dBA, noise attenuation is anticipated to occur as shown on Table 17-9.

Table 17-9
Construction Noise Impacts and Attenuation of a Noise Source of 78 to 88 dBAs

Distance (feet)	Noise Level (dBA)
50	78 - 88
100	72 - 82
200	66 - 76
400	60 - 70
800	54 - 64
1,600	48 - 58
3,200	42 - 52
6,400	36 - 46
12,800	30 - 40

Summary of Impact Assessment

The impacts shown in Table 17-10 assume implementation of the Next Steps to reduce the adverse impacts.

Table 17-10
Summary of Benefit and Impact Assessments to Noise

Alternative	Basis of Comparison	Changes by Phase				Comments	Next Steps
		I	II	III	IV		
Criterion: Exposure of people to or generate noise levels in excess of standards.							
No Action Alternative	Existing Conditions	L	L	L	L	Construction would cause noise along the shoreline related to trucks. Pile driving could occur during construction of buildings or hydraulic structures. Operations noises could be related to pumping plants and employee vehicles.	Use hydraulically or electrically powered impact tools when possible. Use an exhaust muffler on the compressed air exhaust. Install manufacturer's standard noise control devices, such as mufflers, on construction equipment. Locate stationary equipment and components as far as possible from noise sensitive receptors. Notify nearby property users whenever extremely noisy work might occur to allow closure of windows. Keep idling of construction equipment to a minimum Install temporary or portable acoustic barriers. Use noise enclosures with acoustical louvers, baffle walls, and/or acoustical panels. Phase construction to reduce noise.
	No Action Alternative	NA	NA	NA	NA		
Alternatives 1 and 2	Existing Conditions	L	L	L	L	Similar to No Action Alternative. Extent of impacts related to number of truck trips/day and employees on site that may drive individual cars.	Same as No Action Alternative.
	No Action Alternative	L	L	L	L		
Alternatives 3 - 8	Existing Conditions	S	S	S	S	Similar to No Action Alternative. Extent of impacts related to number of truck trips/day and employees on site that may drive individual cars. Amount of imported rock and gravel higher on Alternatives 3 - 8 than Alternatives 1 - 2; therefore, noise impacts would be greater and less likely to be mitigable.	Same as No Action Alternative.
	No Action Alternative	S	S	S	S		

Table 17-10
Summary of Benefit and Impact Assessments to Noise

Alternative	Basis of Comparison	Changes by Phase				Comments	Next Steps
		I	II	III	IV		
Criterion: Exposure of people to or generate excessive ground-borne vibration or ground-borne noise levels .							
No Action Alternative	Existing Conditions	S	S	S	O	Construction activities related to pile driving at pumping plants and hydraulic structures.	Potentially could reduce vibrations by isolating the pile-driving equipment.
	No Action Alternative	NA	NA	NA	NA		
Alternatives 1, 2, and 4	Existing Conditions	S	S	S	O	Activities similar to No Action Alternative. However, activities would occur further from the shoreline than under the No Action Alternative.	Same as No Action Alternative.
	No Action Alternative	L	L	L	O		
Alternatives 3 and 5 - 8	Existing Conditions	S	S	S	O	Construction activities related to pile driving at pumping plants, hydraulic structures, and Perimeter Dikes would be more extensive than under No Action Alternative.	Same as No Action Alternative.
	No Action Alternative	S	L	L	O		

Legend for Types of Benefits or Impacts in Each Phase:
S = Significant Impact
O = No Impact
L = Less Than Significant
B = Beneficial Impact
NA = Not Analyzed

No Action Alternative

As described in Chapter 3, this alternative would involve construction and operations and maintenance activities for the Sedimentation/Distribution Basins, Air Quality Management, Pupfish Channels, and Salton Sea. The construction activities would be identical under the No Action Alternative-CEQA Conditions and the No Action Alternative-Variability Conditions. Therefore, impacts related to disturbance would be the same for both conditions.

The ambient noise levels in the future would be dependent upon factors such as population growth, land use changes, and changes to the amount of vehicular, air, and rail traffic. In general, noise is expected to increase as the population and traffic increases. Full buildout of communities under the current general and area plans would result in some residential development that would be exposed to increasing noise.

Construction activities would adversely affect noise receptors at the communities, especially due to the traffic and construction of the Air Quality Management Canal along the shorelines and Air Quality Management pumping plants in the Sea Bed that may require pile driving. Noise from the pumping plants could also affect noise receptors at the communities. Depending on the proximity of construction and operations and maintenance activities to sensitive receptors, impacts could be significant because these receptors could be exposed to a substantial temporary or periodic increase in ambient noise levels that could exceed standards established by Imperial and Riverside counties.

Vibratory equipment, such as pile drivers, could be required during the construction of structures such as pumping plants. Depending on the location of individual construction sites and their proximity to sensitive receptors, the use of this equipment potentially could generate, or expose persons to, excessive ground-borne vibration or ground-borne noise levels.

During Phases I through III, there would be about 4 truck trips/day to transport rock and gravel. This would not cause a substantial increase in noise along the roadways as compared to Existing Conditions.

Alternative 1 – Saline Habitat Complex I

As described in Chapter 3, this alternative would involve construction and operations and maintenance activities for the Sedimentation/Distribution Basins, Air Quality Management, Pupfish Channels, Saline Habitat Complex, and Brine Sink.

Construction in Alternative 1 would include similar levels of noise as would occur in the No Action Alternative for the Sedimentation/Distribution Basins and Air Quality Management components. Construction of the Saline Habitat Complex would occur in areas adjacent to agricultural lands and would not be anticipated to adversely affect sensitive noise receptors. Therefore, noise impacts on the Sea Bed and along the shoreline would be similar to those that would occur under the No Action Alternative.

During peak construction periods, there would be about 50 truck trips/day to transport rock and gravel. This would not cause a substantial increase in noise along the roadways as compared to the No Action Alternative or Existing Conditions.

Alternative 2 – Saline Habitat Complex II

As described in Chapter 3, this alternative would involve construction and operations and maintenance activities for the Sedimentation/Distribution Basins, Air Quality Management, Saline Habitat Complex, Shoreline Waterway, Saltwater Conveyance, and Brine Sink.

Noise impacts from construction and operations and maintenance activities in the Sea Bed and along the shoreline would be similar to those described under Alternative 1.

During peak construction periods, there would be about 100 truck trips/day to transport rock and gravel. This would not cause a substantial increase in noise along the roadways as compared to the No Action Alternative or Existing Conditions.

Alternative 3 – Concentric Rings

As described in Chapter 3, this alternative would involve construction and operations and maintenance activities for the Sedimentation/Distribution Basins, Air Quality Management, First and Second rings, and Brine Sink.

Noise impacts from construction and operations and maintenance activities on the Sea Bed and along the shoreline would be greater than those described under the No Action Alternative due to construction of the Perimeter Dikes that form the First and Second Rings along the shoreline in close proximity to numerous communities. As described in Chapter 3, construction would occur 24 hours/day and 7 days/week.

During peak construction periods, there would be about 1,200 truck trips/day to transport rock and gravel. This would cause adverse impacts related to noise along the roadways as compared to No Action Alternative and Existing Conditions.

Alternative 4 – Concentric Lakes

As described in Chapter 3, this alternative would involve construction and operations and maintenance activities for the Sedimentation/Distribution Basins; First, Second, Third, and Fourth lakes; and Brine Sink.

Noise impacts from construction and operations and maintenance activities on the Sea Bed and along the shoreline would be similar those described under Alternative 3.

During peak construction periods, there would be about 90 truck trips/day to transport rock and gravel. This would not cause adverse impacts related to noise along the roadways as compared to No Action Alternative and Existing Conditions.

Alternative 5 – North Sea

As described in Chapter 3, this alternative would involve construction and operations and maintenance activities for the Sedimentation/Distribution Basins, Air Quality Management, Saline Habitat Complex, Shoreline Waterway, Saltwater Conveyance, Marine Sea, Marine Sea Recirculation Canal, and Brine Sink.

Noise impacts from construction and operations and maintenance activities on the Sea Bed and along the shoreline would be similar those described under Alternative 3.

During peak construction periods, there would be about 1,400 truck trips/day to transport rock and gravel. This would cause adverse impacts related to noise along the roadways as compared to No Action Alternative and Existing Conditions.

Alternative 6 – North Sea Combined

As described in Chapter 3, this alternative would involve construction and operations and maintenance activities for the Sedimentation/Distribution Basin, Air Quality Management, Pupfish Channels, Saline Habitat Complex, Shoreline Waterway, Saltwater Conveyance, Marine Sea, Marine Sea Mixing Zone, Marine Sea Recirculation Canal, and Brine Sink.

Noise impacts from construction and operations and maintenance activities on the Sea Bed and along the shoreline would be similar those described under Alternative 3.

During peak construction periods, there would be about 2,200 truck trips/day to transport rock and gravel. This would cause adverse impacts related to noise along the roadways as compared to No Action Alternative and Existing Conditions.

Alternative 7 – Combined North and South Lakes

As described in Chapter 3, this alternative would involve construction and operations and maintenance activities for the Sedimentation/Distribution Basin, Air Quality Management using Protective Salt Flat on Exposed Playa below -255 feet msl, Exposed Playa without Air Quality Management above -255 feet msl, Saline Habitat Complex, Recreational Saltwater Lake, Recreational Estuary Lake, Marine Sea Recirculation Canal, IID Freshwater Reservoir, two Treatment Plants, and Brine Sink.

Noise impacts from construction and operations and maintenance activities on the Sea Bed and along the shoreline would be similar those described under Alternative 3.

During peak construction periods, there would be about 2,500 truck trips/day to transport rock and gravel. This would cause adverse impacts related to noise along the roadways as compared to No Action Alternative and Existing Conditions.

Alternative 8 – South Sea Combined

As described in Chapter 3, this alternative would involve construction and operations and maintenance activities for the Sedimentation/Distribution Basins, Air Quality Management, Saline Habitat Complex, Shoreline Waterway, Marine Sea, Marine Sea Recirculation Canal, and Brine Sink.

Noise impacts from construction and operations and maintenance activities on the Sea Bed and along the shoreline would be similar those described under Alternative 3.

During peak construction periods, there would be about 2,700 truck trips/day to transport rock and gravel. This would cause adverse impacts related to noise along the roadways as compared to No Action Alternative and Existing Conditions.

Next Steps

During the project-level analysis, a detailed noise study could be conducted, identifying existing conditions, construction noise, and resulting noise levels at sensitive receptors. Potential vibration impacts would be identified as well. To minimize noise impacts during all phases, measures such as the following could be incorporated into the final facilities or construction requirements:

- Use hydraulically or electrically powered impact tools when possible. If the use of pneumatically powered tools is unavoidable, use an exhaust muffler on the compressed air exhaust;
- Install manufacturer's standard noise control devices, such as mufflers, on construction equipment;
- Locate stationary equipment and components as far as possible from noise sensitive receptors;
- Notify nearby property users whenever extremely noisy work might occur;
- Keep idling of construction equipment to a minimum;
- Install temporary or portable acoustic barriers around stationary construction noise sources;
- As appropriate, modify noise enclosures with acoustical louvers, baffle walls, and/or acoustical panels; and
- Phase construction to reduce noise.