

4.9. Noise and Vibration

4.9.1. Introduction

This section provides an overview of the existing noise environment as well as applicable plans and policies. It also evaluates the potential for noise impacts to occur as a result of the proposed Project. Appendix H to this draft EIR includes the relevant noise data used to analyze impacts in this analysis.

The Project, which would be constructed in three phases, has four main elements that could result in noise impacts: 1) wastewater treatment facility, 2) pump stations, 3) wastewater collection and recycled water distribution system pipelines, and 4) percolation ponds and groundwater injection wells. For the purposes of this section, "Project area" refers to the area that encompasses the extents of the four main elements described above and the area that would be served by these proposed Project facilities; "Project site" refers specifically to those areas that would be disturbed by construction activities associated with these four main elements. The Project would include a Local Coastal Program Amendment and modification of zoning for the wastewater treatment facility to include an Institutional District Overlay.

Noise Fundamentals

Noise is generally defined as unwanted sound. It may be loud, unpleasant, unexpected, or undesired sound typically associated with human activity that interferes with or disrupts the normal noise-sensitive ongoing activities of others. The objectionable nature of noise can be caused by its pitch or its loudness. Pitch is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. Loudness is the amplitude of sound waves combined with the reception characteristics of the ear. Amplitude may be compared with the height of an ocean wave. Technical acoustical terms commonly used in this section are defined in Table 4.9-1.

Decibels and Frequency

In addition to the concepts of pitch and loudness, several noise measurement scales are used to describe noise. The decibel (dB) is a unit of measurement that indicates the relative amplitude of a sound. Zero on the decibel scale corresponds to the lowest sound pressure that a healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 dB represents a tenfold increase in acoustic energy, while 20 dB is 100 times more intense, and 30 dB is 1,000 times more intense. There is a relationship between the subjective noisiness or loudness of a sound and its level. Each 10 dB increase in sound level is perceived as approximately a doubling of loudness over a wide range of amplitudes. Because decibels are logarithmic units, sound pressure levels are not added arithmetically. When two sounds of equal sound pressure level are added, the result is a sound pressure level that is 3 dB higher. For example, if the sound level were 70 dB when 100 cars pass an observer, then it would be 73 dB when 200 cars pass. Doubling the amount of energy would result in a 3 dB increase to the sound level. Overall noise levels will not change appreciably when a noise source is added to a relatively louder noise source. For example, if a 60 dB noise source is added to a 70 dB noise source, a noise level of 70.4 dB would result. Frequency relates to the number of pressure oscillations per second, or Hertz. The range of

sound frequencies that can be heard by healthy human ears is from about 20 Hz at the low frequency end to 20,000 Hz (20 kilohertz [kHz]) at the high frequency end.

Table 4.9-1. Definitions of Acoustical Terms

Term	Definition
Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20 micropascals.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micropascals (or micronewtons) per square meter where 1 pascal is the pressure resulting from a force of 1 newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micropascals in air). The sound pressure level is the quantity that is measured directly by the sound level meter.
Frequency (Hertz [Hz])	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 and 20,000 Hz. Infrasonic sounds are below 20 Hz, and ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level (dBA)	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low- and very high-frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level (L_{eq})	The average A-weighted noise level during the measurement period. The hourly L_{eq} used for this report is denoted as dBA $L_{eq}[h]$.
Community Noise Equivalent Level (CNEL)	The average A-weighted noise level during a 24-hour period, obtained after the addition of 5 dB to sound levels in the evening between 7 p.m. and 10 p.m. and after the addition of 10 dB to sound levels between 10 p.m. and 7 a.m.
Day/Night Noise Level (L_{dn})	The average A-weighted noise level during a 24-hour period, obtained after the addition of 10 dB to levels measured between 10 p.m. and 7 a.m.
L_1 , L_{10} , L_{50} , L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	Noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, time of occurrence, and tonal or informational content as well as the prevailing ambient noise level.
Source: Harris, 1998.	

There are several methods for characterizing sound. The most common is the A-weighted sound level, or dBA. This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Studies have shown that the A-weighted level is closely correlated with annoyance

caused by traffic noise. Other frequency weighting networks, such as C weighting, or dBC, have been devised to describe noise levels for specific types of noise (e.g., explosives). Table 4.9-2 lists the typical A-weighted noise levels that occur in human environments.

Noise Descriptors

Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations is used. L_{eq} is the energy-mean A-weighted sound level present or predicted to occur during a specified interval. It is the equivalent constant sound level that a given source would need to produce to equal the fluctuating level of measured sound.

It is often desirable to also know the range of acoustic levels of the noise source being measured. This is accomplished through the L_{max} and L_{min} noise descriptors. They represent the root-mean-square (RMS) maximum and minimum obtainable noise levels measured during the monitoring interval. The L_{min} value obtained for a particular monitoring location represents the quietest moment occurring during the measurement period and is often called the *acoustic floor* for that location. Likewise, the loudest momentary sound during the measurement is represented by L_{max} , which is often described as the loudest 1-second period during the averaging period. To describe the time-varying character of environmental noise, the statistical noise descriptors L_{10} , L_{50} , and L_{90} (or other percentile values) may be used. These are the noise levels equaled or exceeded 10%, 50%, and 90%, respectively, of the time during the measured interval. Percentile descriptors are most commonly found in nuisance noise ordinances to allow for different noise levels during various portions of an hour. For example, the L_{50} value would represent 30 minutes of a 1-hour period, L_{25} would be associated with 15 minutes of an hour, and so on. Two metrics are used to describe the 24-hour average, L_{dn} and CNEL, and both include penalties for noise during nighttime hours. CNEL also penalizes noise during the evening. CNEL and L_{dn} are normally within 1 dBA of each other and used interchangeably in this section. L_{dn} and CNEL are approximately equal to the L_{eq} peak hour under normal traffic conditions (California Department of Transportation [Caltrans] 2006).¹

Human Response to Noise

Noise-sensitive receptors are generally defined as locations where people reside or where the presence of unwanted sound may adversely affect the use of the land. Noise-sensitive receptors typically include residences, hospitals, schools, guest lodging facilities, libraries, and certain types of passive recreational uses.

Studies have shown that, under controlled conditions in an acoustics laboratory, a healthy human ear is able to discern changes in sound levels of 1 dBA. In the normal environment, changes in the noise level of 3 dBA are considered just noticeable by most people. A change of 5 dBA is readily perceptible, and a change of 10 dBA is perceived as being twice as loud.

¹ California Department of Transportation. 2006. *Caltrans Highway Design Manual*. September.

Table 4.9-2. Typical Noise Levels in the Environment

Noise Level dBA	Extremes	Home Appliances	Speech at 3 feet	Motor Vehicles at 50 feet	General Type of Community Environment	
120	Jet aircraft at 500 feet					
110						
100			Chain saw			
90			Power lawnmower		Diesel truck (not muffled)	
80			Shop tools	Shout	Diesel truck (muffled)	
70			Blender	Loud voice	Automobile at 70 mph	Major metropolis
60			Dishwasher	Normal voice	Automobile at 40 mph	Urban (daytime)
50			Air-conditioner	Normal voice (back to listener)	Automobile at 20 mph	Suburban (daytime)
40			Refrigerator			Rural (daytime)
30						
20						
10	Threshold of hearing					

Source: Harris Miller Miller & Hanson, Inc., 2003.

Noise and Health

A number of studies have linked increases in noise with health effects, including hearing impairment, sleep disturbance, cardiovascular effects, psychophysiological effects, and potential impacts on fetal development (Babisch 2005). Potential health effects appear to be caused by both short- and long-term exposure to very loud noises and long-term exposure to lower levels of sound. Acute sounds of LAF² greater than 120 dB can cause mechanical damage to hair cells of the cochlea (the auditory portion of the inner ear) and hearing impairment (Babisch 2005).³ An LAF greater than 120 dB is equivalent to a rock concert or a jet plane flying overhead at 984 feet.

The World Health Organization and the U.S. Environmental Protection Agency (EPA) consider an L_{eq} of 70 dBA to be a safe daily average noise level for the ear. However, even this “ear-safe” level may

² LAF = sound level with an “A” frequency weighting and “fast” time weighting.

³ Babisch, Wolfgang. 2005. Guest Editorial Health and Noise. *Environmental Health Perspective* 113:A14–A15.

disturb sleep and concentration and may be linked to chronic health impacts such as hypertension and heart disease (Babisch 2006).⁴

A number of studies have looked at the potential health effects of chronic lower noise levels, such as noise from traffic, especially as these noise levels affect children. In a study of school children in Germany, blood pressure was found to be 10 mmHg (millimeters of mercury) higher in a group of students exposed to road traffic noise from high-traffic transit routes (Babisch 2006). A study of pregnant women by Kawada (2004)⁵ showed that airplane noise was associated with decreased fetal body weight.

Sound Propagation

When sound propagates over a distance, it changes in both level and frequency content. The manner in which noise is reduced with distance depends on the factors outlined below.

Geometric spreading. In the absence of obstructions, sound from a single source (i.e., a “point” source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates (or drops off) at a rate of 6 dBA for each doubling of distance. Highway noise is not a single stationary point source of sound. The movement of vehicles on a highway makes the source of the sound appear to emanate from a line (i.e., a “line” source) rather than from a point. This results in cylindrical spreading rather than spherical spreading from a point source. The change in sound level from a line source is 3 dBA per doubling of distance.

Ground absorption. Usually the noise path between the source and the observer is very close to the ground. Noise attenuation from ground absorption and reflective wave canceling add to the attenuation because of geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is done for simplification only; for distances of less than 200 feet, prediction results based on this scheme are sufficiently accurate. For acoustically “hard” sites (i.e., sites with a reflective surface, such as a parking area or a smooth body of water, between the source and the receiver), no excess ground attenuation is ~~assumed~~expected. For acoustically absorptive or “soft” sites (i.e., sites with an absorptive ground surface, such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dBA per doubling of distance is ~~normally assumed~~typically used. When added to the geometric spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dBA per doubling of distance for a line source and 7.5 dBA per doubling of distance for a point source.

Atmospheric effects. Research by Caltrans and others has shown that atmospheric conditions can have a major effect on noise levels. Wind has been shown to be the single most important meteorological factor within approximately 500 feet of a receiver, whereas vertical air temperature gradients are more important over longer distances. Other factors, such as air temperature, humidity, and turbulence, also have major effects. Receivers located downwind from a source may be exposed to increased noise levels relative to calm conditions, whereas locations upwind may have lower noise levels. Increased sound levels can also occur because of temperature inversion conditions (i.e., increasing temperature with elevation).

⁴ Babisch, Wolfgang. 2006. Road Traffic Noise and Cardiovascular Risk. *Noise and Health*, Volume 10, page 1.

⁵ Kawada, Tomoyuki. 2004. The Effect of Noise on the Health of Children. *J Nippon Med School* 2004, page 5.

Shielding by natural or human-made features. A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by this shielding depends on the size of the object, proximity to the noise source and receiver, surface weight, solidity, and the frequency content of the noise source. Natural terrain features (such as hills and dense woods) and human-made features (such as buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receiver to reduce noise. A barrier that breaks the line of sight between a source and a receiver will typically result in at least 5 dB of noise reduction. A higher barrier may provide as much as 20 dB of noise reduction.

Environmental Vibration Fundamentals

Groundborne vibration is a small, rapidly fluctuating motion transmitted through the ground. The strength of groundborne vibration diminishes (or attenuates) fairly rapidly over distance. Some soil types transmit vibration quite efficiently; other types (primarily sandy soils) do not. Several basic measurement units are commonly used to describe the intensity of ground vibration. The descriptors used by the Federal Transit Administration (FTA) are peak particle velocity (PPV), in units of inches per second, and the velocity decibel (VdB). The calculation to determine PPV at a given distance is:

$$PPV_{\text{distance}} = PPV_{\text{ref}} * (25/D)^{1.5}$$

where

PPV_{distance} = the peak particle velocity in inches/second of the equipment adjusted for distance,

PPV_{ref} = the reference vibration level in inches/second at 25 feet, and

D = the distance from the equipment to the receiver.

The velocity parameter (instead of acceleration or displacement) best correlates with human perception of vibration. Thus, the response of humans, buildings, and sensitive equipment to vibration is described in this section in terms of the RMS velocity level in VdB units relative to 1 micro-inch per second. As a point of reference, the average person can just barely perceive vibration velocity levels below 70 VdB (typically in the vertical direction). The calculation to determine vibration level at a given distance is:

$$L_v(D) = L_v(25 \text{ feet}) - 30 * \log(D/25)$$

where

$L_v(D)$ = the vibration level at the receiver,

$L_v(25 \text{ feet})$ = the reference source vibration level, and

D = the distance from the vibration activity to the receiver.

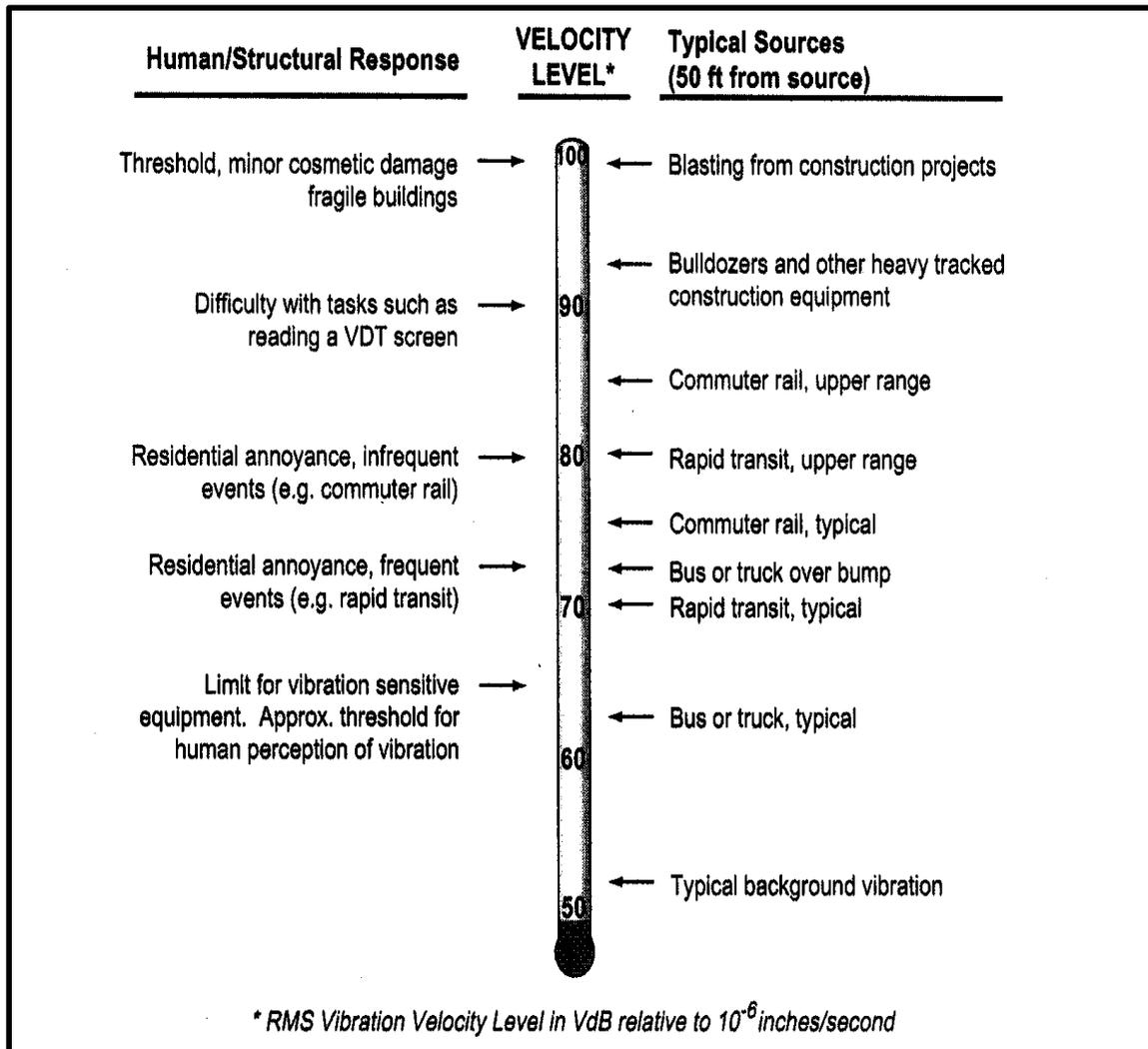
A comparison of common groundborne vibration levels is shown in Figure 4.9-1. Typical background vibration levels are between 50 and 60 VdB, whereas the levels for minor cosmetic damage to fragile buildings are generally in the area of 100 VdB.

Vibration-Sensitive Land Uses

The FTA *Transit Noise and Vibration Impact Assessment*, prepared in 2006, is a guide for designating the criteria for acceptable groundborne vibration. The vibration categories outlined below are from that report.

Vibration Category 1 – High Sensitivity: Category 1 includes buildings where vibration would interfere with internal operations, including levels that may be well below those associated with human annoyance. Concert halls and other special-use facilities are covered separately in Table 8-2, which is included at the end of Appendix F of the FTA *Transit Noise and Vibration Impact Assessment*. Typical land uses covered by Category 1 are vibration-sensitive manufacturing facilities, hospitals with vibration-sensitive equipment, and university research operations. The degree of sensitivity to vibration depends on the specific equipment affected by the vibration. Equipment such as electron microscopes and high-resolution lithographic equipment can be very sensitive to vibration, and even normal optical microscopes will sometimes be difficult to use when vibration is well below the human annoyance level. Computer chip manufacturing is another example of a vibration-sensitive process.

Figure 4.9-1. Common Groundborne Vibration Levels



Source: FTA, 2006.

The vibration limits for Category 1 are based on acceptable vibration for moderately vibration-sensitive equipment such as optical microscopes and electron microscopes with vibration isolation systems. Defining limits for equipment that is even more sensitive requires a detailed review of the specific equipment involved. This type of review is usually performed during the detailed analysis associated with the final design phase and not as part of the environmental impact report. Mitigation of vibration that affects sensitive equipment typically involves modification of the equipment mounting system or relocation of the equipment rather than applying vibration control measures to the proposed Project.

Note that this category does not include most computer installations or telephone switching systems. Although their owners often are very concerned about the potential for groundborne vibration to interrupt operations, it is rare for computer or other electronic equipment to be particularly sensitive to vibration. Most such equipment is designed to operate in typical building environments where the equipment may experience occasional shock from bumping and continuous background vibration caused by other equipment.

Vibration Category 2 – Residential: This category covers all residential land uses and any buildings where people sleep, such as hotels and hospitals. No differentiation is made between different types of residential areas, primarily because groundborne vibration and noise are experienced indoors and building occupants have practically no means for reducing their exposure. Even in a noisy urban area, bedrooms often will be quiet in buildings that have effective noise insulation and tightly closed windows. Moreover, street traffic often abates at night. Hence, an occupant of a bedroom in a noisy urban area is likely to be no more exposed to groundborne noise and vibration than someone in a quiet suburban area.

Vibration Category 3 – Institutional: Vibration Category 3 includes churches, schools, other institutions, and quiet offices that do not have vibration-sensitive equipment but still have the potential for activity interference. Although it is generally appropriate to include office buildings in this category, it is not appropriate to include all buildings that have office space. For example, most industrial buildings have office space, but it is not intended that buildings with primarily industrial uses be included in this category⁶ (FTA 2006).

4.9.2. Environmental Setting

Regulatory Setting

Federal Regulations

There are no federal noise standards for construction or operation of a project of this type.

State Regulations

California requires each local government entity to perform noise studies and implement a noise element as part of its general plan. State land use guidelines for evaluating the compatibility of various land uses, as a function of community noise exposure, are listed in Table 4.9-3 (State of California 1990).⁷

Table 4.9-3. State Land Use Compatibility Standards for Community Noise Environment

Land Use Category	Community Noise Exposure – L _{dn} or CNEL (dB)						
	50	55	60	65	70	75	80
Residential – Low-Density Single-Family Home, Duplex, Mobile Home	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
Residential – Multifamily	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded

⁶ Federal Transit Administration. 2006. *Transit Noise and Vibration Impact Assessment*. Prepared by Harris Miller Miller & Hanson. Burlington, MA.

⁷ State of California. 1990. *General Plan Guidelines*. Office of Planning and Research. June.

Land Use Category	Community Noise Exposure – L _{dn} or CNEL (dB)						
	50	55	60	65	70	75	80
Transient Lodging – Motel, Hotel	[Solid Black]			[Medium Gray]		[Dark Gray]	[Hatched]
Schools, Libraries, Churches, Hospitals, Nursing Homes	[Solid Black]			[Medium Gray]		[Dark Gray]	[Hatched]
Auditorium, Concert Hall, Amphitheaters	[Medium Gray]				[Dark Gray]		
Sports Arena, Outdoor Spectator Sports	[Solid Black]			[Medium Gray]		[Dark Gray]	[Hatched]
Playgrounds, Neighborhood Parks	[Solid Black]				[Medium Gray]		[Dark Gray]
Golf Courses, Riding Stables, Water Recreation, Cemeteries	[Solid Black]					[Dark Gray]	[Hatched]
Office Buildings, Business Commercial, and Professional	[Solid Black]				[Medium Gray]		[Dark Gray]
Industrial, Manufacturing, Utilities, Agriculture	[Solid Black]					[Dark Gray]	[Hatched]
[Solid Black]	Specified land use is satisfactory, based on the assumption that any buildings involved were built with normal conventional construction, without any special noise-insulation requirements.						
[Medium Gray]	New construction or development should be undertaken only after a detailed analysis of the noise-reduction requirements is made and needed noise-insulation features are included in the design.						
[Dark Gray]	New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise-reduction requirement must be made and needed noise-insulation features included in the design.						
[Hatched]	New construction or development generally should not be undertaken.						
Source: State of California, 1990.							

Local Regulations

The proposed Project lies within the jurisdiction of the City of Malibu and unincorporated Los Angeles County. Both entities have established policies and regulations concerning the generation and control of noise that could adversely affect citizens and noise- and vibration-sensitive land uses.

County of Los Angeles Noise Ordinance (County Code)

The County's Noise Ordinance is part of the County Code, which specifies hours allowed for construction activities. The County's Noise Ordinance states:

Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration, or demolition work between weekday hours of 7 p.m. and 7 a.m., or at any time on Sundays or holidays, such that the sound therefrom creates a noise disturbance across a residential or commercial real property line, except for emergency work of public service utilities or by variance issued by the health officer, is prohibited. The contractor (construction) shall conduct construction activities in such a manner that the maximum noise levels at the affected buildings will not exceed those listed in the following schedule:

At Residential Structures

Mobile Equipment. Maximum noise levels for nonscheduled, intermittent, short-term operation (less than 10 days) of mobile equipment:

	Single-Family Residential	Multifamily Residential	Semi-residential/ Commercial
Daily, except Sundays and legal holidays, 7 a.m. to 8 p.m.	75 dBA	80 dBA	85 dBA
Daily 8 p.m. to 7 a.m. and all day Sunday and legal holidays	60 dBA	64 dBA	70 dBA

Stationary Equipment. Maximum noise level for repetitively scheduled and relatively long-term operation (periods of 10 days or more) of stationary equipment:

	Single-Family Residential	Multifamily Residential	Semi-residential/ Commercial
Daily, except Sundays and legal holidays, 7 a.m. to 8 p.m.	60 dBA	65 dBA	70 dBA
Daily 8 p.m. to 7 a.m. and all day Sunday and legal holidays	50 dBA	55 dBA	60 dBA

At Business Structures

Mobile Equipment. Maximum noise levels (County of Los Angeles 1978)⁸ for nonscheduled, intermittent, short-term operation of mobile equipment are as follows:

- Daily, including Sunday and legal holidays, all hours: maximum of 85 dBA.
- All mobile or stationary internal combustion-powered equipment or machinery shall be equipped with suitable exhaust and air intake silencers in proper working order.

⁸ County of Los Angeles. 1978a. *Los Angeles County Code*. Chapter 1208, Part 4, Section 12.08.440, Construction Noise. Available: <<http://library.municode.com/index.aspx?clientId=16274>>. Accessed: December 12, 2012.

The County has also established vibration thresholds (County of Los Angeles 1978),⁹ which state:

Operating or permitting the operation of any device that creates vibration above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property or at 150 feet (46 meters) from the source if on a public space or public right-of-way is prohibited. The perception threshold shall be a motion velocity of 0.01 inch/second over the range of 1 to 100 Hertz.

County of Los Angeles Noise Element

The County is in the process of updating its general plan; therefore, applicable noise thresholds are presented from both the 2012 draft general plan update and from the existing general plan.

Existing General Plan Noise Element

The aim of the general plan Noise Element, as noted in the statement of goals, is to:

- Reduce transportation noise,
- Minimize noise levels from future transportation facilities, and
- Establish compatible land uses adjacent to transportation facilities.

Other policies and implementation and action programs exist in the general plan to define these goals further.¹⁰

2012 General Plan Update

The County's 2012 general plan update refers to the Federal Highway Administration (FHWA) standards for traffic noise:

Transit noise is regulated by the FTA, while freeways that are part of the interstate highway system are regulated by FHWA. The FHWA has adopted and promulgated noise abatement criteria for highway construction projects. The federal government encourages local jurisdictions to use their land use regulatory authority to site new development to minimize potential noise impacts.

Federal and state laws in many instances preempt local laws from controlling certain sources by setting noise levels and operational procedures for aircraft, motor vehicles, and interstate carriers.

Appendix G of the County's Noise Element refers to the FHWA noise criteria for land use Activity Category B receivers, which include residences, schools, churches, motels, and other noise-sensitive receivers. The noise criterion for these receivers is 67 dBA $L_{eq}(h)$.

Other goals and policies¹¹ incorporated within the general plan include:

- Policy N 1.1: Utilize land uses to buffer noise-sensitive uses from adverse noise impacts.
- Policy N 1.2: Reduce exposure to noise impacts by promoting land use compatibility.
- Policy N 1.3: Minimize impacts on noise-sensitive land uses by ensuring adequate site design, acoustical construction, and use of barriers and berms.

⁹ County of Los Angeles. 1978b. *Los Angeles County Code*. Chapter 1208, Part 4, Section 12.08.560, Vibration. Available: <<http://library.municode.com/index.aspx?clientId=16274>>. Accessed: December 12, 2012.

¹⁰ County of Los Angeles. 1975. *Los Angeles County General Plan, Noise Element*.

¹¹ County of Los Angeles. 2012. *Draft General Plan 2035, Noise Element*.

City of Malibu Noise Ordinance (Municipal Code)

The City of Malibu Noise Ordinance states under Section 8.24.050, Prohibited Acts:

Notwithstanding any other provisions of this chapter, the following acts and the causing or permitting thereof, are declared to be in violation of this chapter:

- G. Construction: Operating or causing the operation of any tools, equipment, impact devices, derricks, or hoists used in construction, chilling, repair, alteration, demolition, or earthwork on weekdays between the hours of 7 p.m. and 7 a.m., before 8 a.m. or after 5 p.m. on Saturday, or at any time on Sundays or holidays, except as provided in Section 8.24.060(D).

Section 8.24.060, Exemptions, states which acts are exempt from the Noise Ordinance:

- D. Construction—Special Circumstances. The provisions of Section 8.24.050 do not apply to any person who performs construction, repair, excavation or earthmoving work pursuant to the expressed written permission of the city manager to perform such work at times prohibited in Section 8.24.050. The applicant must submit to the city manager an application in writing, stating the reasons for the request and the facts upon which such reasons are based. The city manager may grant written permission for the construction if he or she finds that:
 1. The work proposed to be done is in the public interest.
 2. Hardship, injustice, or unreasonable delay would result from the interruption thereof during the hours and days specified in Section 8.24.050, or
 3. The building or structure involved is devoted or intended to be devoted to a use immediately incident to public defense.

City of Malibu Noise Element

The City of Malibu General Plan Noise Element establishes standards for exterior sound levels based on land use categories. The Noise Element states that the maximum acceptable outdoor noise exposure level for residential is 75 dBA CNEL and 85 dBA CNEL for commercial and institutional during daytime hours.

Table 4.9-4 summarizes the City's maximum exterior noise limits (City of Malibu 1995).¹²

Existing Conditions

Short-term noise measurements were taken at five measurement sites in the Project area to establish the existing ambient noise environment. Noise-sensitive land uses surrounding the proposed wastewater treatment facility and pipelines include the following:

- Residential,
- Retail and commercial,
- Schools,
- Parks and open space, and
- Churches.

¹² City of Malibu. 1995. *City of Malibu General Plan*. Supplemented and Indexed by Quality Code Publishing. November.

Table 4.9-4. City of Malibu Maximum Exterior Noise Limits, Non-Transportation Sources

Receiving Land Use Category	General Plan Land Use Districts	Time Period	Noise Level (dBA)	
			Leq	Lmax
Rural	All RR Zones and PRF, CR, AH, OS	7 a.m. to 7 p.m.	55	75
		7 p.m. to 10 p.m.	50	65
		10 p.m. to 7 a.m.	40	55
Other Residential	All SFR, MFR, and MFBF Zones	7 a.m. to 7 p.m.	55	75
		7 p.m. to 10 p.m.	50	65
		10 p.m. to 7 a.m.	45	60
Commercial, Institutional	CN, CC, CV, CG, and I Zones	7 a.m. to 7 p.m.	65	85
		7 p.m. to 7 a.m.	60	70
Notes: RR = Rural Residential; PRF = Private Recreational Facilities; CR = Commercial Recreation; AH = Agriculture-Horticulture; OS = Open Space; SFR = Single-Family Residential; MFR = Multifamily Residential; MFBF = Multifamily Beachfront; CN = Commercial Neighborhood; CC = Community Commercial; CV = Commercial Visitor; CG = Commercial General; and I = Institutional.				
Source: City of Malibu, 1995.				

Noise measurements were taken at noise-sensitive land uses to analyze existing ambient noise levels along the proposed construction alignment. However, one noise measurement (ST-1) was taken off the road adjacent to the noise-sensitive land uses because of access constraints. The noise measurements were taken on Thursday, November 14, 2013, by an ICF acoustical engineer using a Larson Davis Model 812 Type 1 sound-level meter (meter). Each measurement lasted 15 minutes and was conducted with the meter mounted on a tripod. A windscreen was used to reduce the effects of wind-related interference. A Larson Davis Cal 200 was used to verify the calibration of the meter before and after each measurement. Noise metrics, including L_{eq} , L_{min} , L_{max} , L_{10} , L_{50} , and L_{90} noise descriptors, were recorded after each measurement. The weather at the time of the measurements was sunny and clear, with a calm wind of about 2 mph blowing from the east. The noise sources surrounding the measurement locations included the existing wastewater treatment plant, traffic, playground activities, and the distant industrial facilities at HRL Laboratories. The measured noise data are summarized below in Table 4.9-5, with mapped locations shown in Figure 4.9-2.

Table 4.9-5. Short-Term Noise Measurement Data (dBA)

Site	Location	Date/Time (M-D-Yr/Hr:Min)	Time	Leq	Lmax	Lmin	L90	L50	L10
ST-1	Civic Center east of Vista Pacifica	11-14-13/1:32 p.m.	15	68.3	80.8	49.2	58.5	66.6	71.9
ST-2	Malibu Bluffs Park	11-14-13/12:15 p.m.	15	53.2	77.5	39.7	43.9	47.9	52.6
ST-3	23854 Malibu Crest Dr	11-14-13/12:56 p.m.	15	52.8	65.6	42.4	46.4	54.7	55.5
ST-4	Intersection of Malibu Rd and PCH	11-14-13/3:03 p.m.	15	66.5	78.8	54.1	59.0	65.0	69.6
ST-5	Legacy Park	11-14-13/2:02 p.m.	15	58.1	70.7	50.0	54.2	57.1	60.4
Source: ICF, 2013.									

4.9.3. Environmental Impact Analysis

Methods

Construction

The proposed Project would include construction of a wastewater treatment facility, pump stations, and a collection and distribution system. The wastewater treatment facility and pump stations would require general site preparation work, earthwork, structural improvements, and installation of the electrical components/instruments. A more detailed description of the construction phases can be found in Chapter 3, Section 3.4.3.

Hourly average construction noise levels were estimated by considering the types of equipment that would be on-site during construction of the proposed Project. This would include backhoes, dozers, excavators, drill rigs, and other items (see Table 4.9-6). Typical noise levels from construction equipment were input into the Roadway Construction Noise Model (RCNM), which considers the equipment type, calculated industry load factor for operation time, distance, and user-defined shielding, to calculate noise levels from construction. The construction noise level model ~~conservatively simulated construction without assumed that no~~ shielding ~~would be~~ in place and ~~with that~~ all construction equipment ~~would be~~ running simultaneously. Therefore, it represents a conservative estimate. The distance from the source to the closest receiver (ST-1) was calculated by using the acoustical center of construction for the proposed wastewater treatment facility. The acoustical center of construction is calculated by multiplying the square root of the closest distance to construction equipment by the farthest distance to construction equipment. For construction of the proposed pipeline network, the distance from the center of the roadway network where the pipeline would be constructed to the closest representative sensitive receiver (ST-3) was calculated.

Table 4.9-6. Construction Equipment List

Construction Equipment ¹ (number of pieces)	Construction Equipment Noise at Distance of 50 feet (dBA L _{eq})
Excavator	85
Bulldozer	85
Compactor	82
Backhoe	80
Forklift	88
Crane	83
Paver	89
Drill rig	98
¹ Same or similar to construction equipment list provided by applicant.	
Source: RCNM, 2008.	

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Figure 4.9-2. Noise Measurement Location Map



Figure 4.9-2
Noise Measurement Location Map
Malibu Centralized Wastewater Project

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Potential vibration impacts associated with construction were modeled by using FTA's guidance manual entitled *Transit Noise and Vibration Impact Assessment* (FTA 2006). A vibration threshold of 0.01 inch per second was used for both County and the City receptors. This threshold was derived from County Code Section 12.08.560.

Operation

Traffic-related operational impacts are not anticipated because the proposed Project would not result in a significant increase in the amount of operational traffic. Operational noise would consist of periodic noise from the generators at the pumps stations and the wastewater treatment facility. Noise from the pumps is not expected because the pumps would be located belowground, and all noise-producing ancillary facilities, such as generators, would be enclosed.

Thresholds of Significance

For the purposes of the analysis in this EIR, in accordance with Appendix G of the State CEQA Guidelines, the proposed Project would have a significant environmental impact related to noise or vibration if it would:

- Expose persons to or generate noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies.
- Expose persons to or generate excessive groundborne vibration or groundborne noise levels.
- Result in a substantial permanent increase in ambient noise levels in the Project vicinity, above levels existing without the Project.
- Result in a substantial temporary or periodic increase in ambient noise levels in the Project vicinity, above levels existing without the Project.
- Be located within an airport land use plan area or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport and expose people residing or working in the Project area to excessive noise levels.
- Be located in the vicinity of a private airstrip and expose people residing or working in the Project area to excessive noise levels.

Impacts

Impact NV-1: Would the Project Expose Persons to or Generate Noise Levels in Excess of Standards Established in a Local General Plan or Noise Ordinance or Applicable Standards of Other Agencies?

Construction

Under the proposed Project, the area in and around the Malibu Civic Center would be taken off septic systems through the development of a three-phase wastewater treatment facility and a 13.7-mile conveyance system. Additionally, an off-site recycled water distribution system would be constructed to distribute disinfected tertiary-treated effluent from the wastewater treatment facility to various land uses for reuse purposes. Pipelines for the wastewater treatment facility, pump stations, and recycled water distribution system would be constructed within the same trench. The list of typical construction equipment is provided above in Table 4.9-6.

Construction equipment for the proposed Project was analyzed using the RCNM, as discussed above. The acoustical center of construction for the proposed wastewater treatment facility would be approximately 300 feet from the closest sensitive receiver (ST-1). The full complement of construction equipment listed in Table 4.9-6 was modeled for construction of the wastewater treatment facility. The measured ambient noise level at ST-1 was 68 dBA L_{eq} (when rounded to the nearest whole number). Table 4.9-7, below, shows that the construction noise level at receiver ST-1 would be 69 dBA L_{eq} (when rounded to the nearest whole number). A noise level of this magnitude would be on the order of 1 dBA louder than the existing ambient noise level. An increase of this magnitude would be below the threshold of perception, because 3 dBA is considered to be the point at which changes in noise levels are perceptible.

Table 4.9-7. Predicted Noise Levels (dBA L_{eq}) from Construction Activities

Construction Activity	Noise Level at ST1 (dBA L_{eq})	Noise Level at ST-2 (dBA L_{eq})	Noise Level at ST-3 (dBA L_{eq})	Noise Level at ST-4 (dBA L_{eq})	Noise Level at ST-5 (dBA L_{eq})
Wastewater Treatment Facility Construction	69	56	48	49	50
Pump Station Construction	65	61	49	81 ²	65
Conventional Pipeline Construction	80	80	80	80	80
Jack-and-Bore Pipeline Construction ¹	89	89	89	89	89
¹ RMC Water, Walnut Creek, CA. April 22, 2014—personal communication. ² Noise levels at ST-4 were modeled using the RCNM at a distance of 50 feet to represent receivers located close to the proposed pumps stations along Malibu Colony Road.					
Source: ICF; U.S. Department of Transportation 2008; RCNM.					

The next-closest sensitive receiver (ST-2) is approximately 1,300 feet from the acoustical center of construction. The measured ambient noise level at ST-2 was 53 dBA L_{eq} . Given the basic rule that noise reduces at a rate of 6 dB per doubling of distance, construction noise levels would be approximately 56 dBA L_{eq} at this location. Construction noise levels of this magnitude would be 3 dB above the existing ambient noise level, which would be the level of perceptibility. Noise levels at all other measured receivers would be below the existing ambient noise level.

Construction associated with the proposed pump stations would most likely be located within 50 feet of sensitive receivers along Malibu Colony Road [and Malibu Road](#). The equipment modeled for construction of the proposed pipeline network included an excavator, backhoe, paver, and front-end loader. Because the pump stations would be located throughout the Project area, the noise profile range would depend on where the pump stations would be located. The pump stations proposed along Malibu Colony Road [and Malibu Road](#) would be closest to sensitive receivers. Receiver location ST-4 was analyzed to represent the western homes along Malibu Colony Road near the intersection with PCH. Construction noise levels at homes located in this area were calculated to be 81 dBA L_{eq} (see Table 4.9-7). Noise levels of this magnitude would be noticeable and would most likely dominate the noise profile during construction. Construction noise levels at other locations would range from 49 dBA to 65 dBA L_{eq} .

Construction associated with the proposed pipeline network would most likely be located within 50 feet of sensitive receivers. The equipment modeled for construction of the proposed pipeline network included an excavator, backhoe, and paver for conventional pipeline construction. At some locations, jack-and-bore construction would be employed. This technique would require use of a crane, generator, compressor, welder, concrete pump, cement mixer truck, dump trucks, flatbed trucks, water trucks, and an auger, which would be lowered into a “jack pit” to drill the pipe laterally. Based on an analysis of comparable jack-and-bore sites, the noise level from this type of construction would be 89 dBA L_{eq}^{13} at a distance of 50 feet.

All modeled measurement locations have noise-sensitive land uses located within 50 feet of the proposed pipeline network. Table 4.9-7 shows that construction noise levels at all measured sensitive receivers would be 80 dBA L_{eq} during conventional construction and 89 dBA L_{eq} during jack-and-bore construction of the proposed pipeline network. Noise levels of this magnitude would dominate the noise environment during construction. However, once construction of the pipeline network is completed, construction noise would cease. Because approximately 50 to 100 feet of pipeline could be installed each day, noise from pipeline construction would affect a given sensitive receptor for only a short period of time. In addition, construction would be expected to be within 50 feet of an individual receptor for less than 1 week.

County

A portion of the proposed pipeline network that would be constructed under Phase 2 of the proposed Project would be located within the jurisdictional boundary of the County of Los Angeles and adjacent to noise-sensitive residential uses (see Figure 4.9-2). Although noise from construction of the proposed wastewater treatment facility would attenuate to a level that would be imperceptible given the distance from construction to sensitive receivers within the County and the shielding provided by structures, noise from construction of the proposed pipeline network would occur close to these sensitive receivers. However, the magnitude of construction noise typically varies over time because construction activity is intermittent, and power demands on construction equipment (and the resulting noise output) are cyclical.

Noise levels during construction of the proposed pipeline network at noise-sensitive receivers would be similar to levels at the modeled receivers (ST-1 through ST-5), as presented in Table 4.9-7. The table indicates that noise levels could be as loud as 80 dBA L_{eq} during conventional construction and 89 dBA L_{eq} during jack-and-bore construction.

Construction noise levels of the magnitude shown in Table 4.9-7 would dominate the existing noise environment. County Code exempts construction activity, provided that it does not occur on weekdays between the hours of 7 p.m. and 7 a.m. or at any time on Sundays or holidays. However, the County requires that mobile equipment not exceed a maximum threshold of 75 dBA at single-family residential land uses. According to the calculations in Table 4.9-7, noise levels would exceed this threshold for a short period of time. Mitigation of a noise impact of this magnitude to a less-than-significant level would not be possible because the mitigation measures would involve erecting noise-attenuating structures such as temporary soundwalls or blankets, which would obstruct access to adjacent residences. However, other mitigation measures (see MM NV-1, below) would be implemented to reduce noise from construction to the greatest extent practicable. Nonetheless, even with the implementation of MM NV-1, construction impacts on noise-sensitive receivers within the County’s jurisdiction would be significant and unavoidable.

¹³ RMC Water, Walnut Creek, CA. April 22, 2014—personal communication.

City

Table 4.9-7 indicates that noise levels from construction of the proposed wastewater treatment facility at noise-sensitive receivers would be 69 and 56 dBA at the two closest sensitive receivers (ST-1 and ST-2), which are located within the City's jurisdiction. At these two locations, noise from construction would exceed the existing ambient noise level by 1 and 3 dB, respectively. Noise levels of this nature would be hardly perceptible.

Table 4.9-7 indicates that noise levels from construction of the proposed pumps station at noise-sensitive receivers would be as high as 81 dBA L_{eq} along Malibu Colony Road and between 49 and 65 dBA L_{eq} at other Project area measurement locations within the City's jurisdiction. At ST-4, noise levels from construction would exceed the ambient noise level by as much as 14 dB. Noise levels associated with construction of the pump stations at receiver ST-2 would exceed the measured ambient noise level by 8 dB. Noise levels at all other locations would be comparable to the measured ambient noise levels.

Noise levels at sensitive receivers located along the proposed pipeline network would be as high as 80 dBA L_{eq} during conventional construction and 89 dBA L_{eq} during jack-and-bore construction. As stated above, noise levels of this nature would dominate the noise environment. However, the magnitude of construction noise typically varies over time because construction is intermittent, and power demands on construction equipment (and the resulting noise output) are cyclical.

The City's Municipal Code exempts construction activity, provided that it does not occur on weekdays between the hours of 7 p.m. and 7 a.m., before 8 a.m. or after 5 p.m. on Saturday, or at any time on Sundays or holidays. Furthermore, MM NV-1, provided below, would be implemented to reduce noise from construction to the greatest extent practicable. Therefore, impacts would be less than significant.

Operation

The proposed wastewater treatment facility would be located on approximately 4.8 acres at 24000 Civic Center Way. This facility would contain subsurface pumps. Although the exact type of pump has not been determined, for the purposes of this analysis, it ~~is assumed~~ is anticipated that a 150-horsepower pump would be used, which would produce a noise level of approximately 76 dBA at a distance of 50 feet (ESA 2002). Because 20 dBA is a conservative estimate of the noise reduction for underground pumps, the noise level would therefore be 56 dBA at a distance of 50 feet. Receiver location ST-1 is the closest measurement location to the proposed wastewater treatment facility. Measured noise levels at this location were 68 dBA. A noise level of this magnitude would exceed the noise level of the pumps. Therefore, pumps associated with the wastewater treatment facility would not be audible at the receiver location.

Nine pump stations would be constructed as part of the collection system. These would convey wastewater flows within the Civic Center area to the proposed wastewater treatment facility. Pump stations would be located along the pipelines at Legacy Park and Bluffs Park, belowground in Phase 1, and on public rights-of-way and/or easements in residential areas in Phases 2 and 3. The only aboveground features of the collection and distribution infrastructure would be the air release valves at high- or low-elevation points along the pipelines, the vent pipes at the pump stations, and the backup generators, transformers, switchboards/meters, and electrical panels. Noise generated at the pump stations would be minimal because the noise-producing equipment would be located in the subsurface vaults. Backup generators would be regularly tested and maintained in conformance

with National Fire Protection Association (NFPA) Standard 110: Standard for Emergency and Standby Power Systems and Air Quality Management District. Additional refueling and generator testing would be performed as needed based on inspections by the City's contractor.

An unhused, unmuffled 250-horsepower generator at a distance of 50 feet would generate a noise level of approximately 107 dBA L_{eq} (Cummins Power Generation msp-1026g). Therefore, a noise level of this magnitude, while temporary and periodic, would be clearly audible at noise-sensitive receivers within the Project area. However, self-contained sound-reducing enclosures would reduce noise levels to 73 dBA (Cummins Power Generation msp-1026g). Ambient noise levels at sensitive receiver location ST-1 were measured at 68 dBA. Noise levels associated with an enclosed, muffled generator would exceed the measured ambient noise by 5 dB. An increase of this magnitude would be noticeable but would not exceed any of the City's thresholds. To ensure that noise from emergency generators does not exceed the City's thresholds, the proposed Project would include MM NV-2, below.

Maintenance activities associated with the proposed wastewater treatment facility would include weekly inspection of the wells and quarterly cleaning as well as periodic lifting of the membranes every 2 to 3 months and replacing them every 8 to 10 years. Solids would be transported off-site once a day by truck and sent to the County Sanitation Districts of Los Angeles County (CSDLAC) Joint Water Pollution Control Plant.

Maintenance activities at the pump stations would include weekly inspections, with wet wells¹⁴ cleaned quarterly. Annual performance testing would also be required to verify meter calibration, calibrate pressure gauges, and sequence the pumps to operate under various flows. Preventive maintenance for mechanical and electrical equipment would be scheduled annually. Emergency power generators would be tested regularly and maintained in conformance with NFPA Standard 110.

Maintenance activities are not expected to cause significant increases in noise, with the exception of emergency generator testing, which was addressed earlier and would be mitigated by MM-NV-2.

The proposed Project would generate a very small number of vehicular trips on a daily basis. ~~Only two~~**Up to three** full-time employees would be required to operate the wastewater treatment facility. Although periodic maintenance would also require a small number of trips, the traffic volumes would not be noticeable. Therefore, impacts from traffic noise would be less than significant.

Noise from operation and maintenance of the proposed Project would be less than significant after mitigation is included.

Impact NV-2: Would the Project Expose Persons to or Generate Excessive Groundborne Vibration or Groundborne Noise Levels?

Construction

During construction of the proposed wastewater treatment facility, pipelines (using conventional and jack-and-bore construction), and pump stations, vibration would occur as large pieces of construction equipment access and operate on the Project site and along the pipeline alignment. FTA has compiled a list of typical vibration levels generated by various types of construction equipment. These are commonly referenced in construction vibration-level analyses.

¹⁴ A wet well is a chamber used for collecting liquid sewage. The suction pipe from the pump is attached to the wet well.

The vibration levels produced by construction equipment are outlined in Table 4.9-8.

Table 4.9-8. Typical Vibration Levels for Construction Equipment

Equipment	Approximate Peak Particle Velocity at 25 feet (inches/second)	Approximate Peak Particle Velocity at Closest Sensitive Receiver (120 feet) (inches/second)
Loaded trucks	0.076	0.005
Dozers	0.089	0.006
Caisson drill rig	0.089	0.006
Notes: Peak particle velocity measured at 25 feet unless noted otherwise. RMS amplitude ground velocity in decibels (VdB) referenced to 1 micro-inch/second.		
Source: FTA, 2006.		

County

County Code sets a threshold of 0.01 inch per second for vibration. Vibration levels from construction of the proposed pipelines associated with the wastewater treatment facility would attenuate to levels below the threshold of perception. Furthermore, construction equipment used during pipeline construction would not be large enough to produce vibration that would exceed the County's threshold. Therefore, impacts would be less than significant.

City

The City has not established a vibration threshold. Therefore, the County's threshold of 0.01 inch per second was used for the sake of consistency. The closest vibration-sensitive receiver to the proposed wastewater treatment facility would be ST-1, located approximately 150 feet from the construction site. Table 4.9-8 shows reference vibration levels at a distance of 25 feet from the vibration source ranging from 0.076 to 0.089 inch per second. Vibration levels at receiver ST-1 would attenuate up to 0.005 and 0.006 inch per second, respectively. Therefore, vibration levels would be well below the County's threshold of 0.01 inch per second. As stated earlier, construction equipment used during pipeline construction would not be large enough to produce vibration levels that would exceed the County's threshold of 0.01 inch per second. Impacts would be less than significant.

Operation

Operation and maintenance of the proposed Project would not produce noticeable vibration levels. No impact would occur.

Impact NV-3: Would the Project Result in a Permanent Increase in Ambient Noise Levels in the Project Vicinity, above Levels Existing without the Project?

Operation

As referenced in Impact 4.9-1, the noise-producing components of the proposed Project would be installed belowground. Furthermore, the proposed Project would not result in a significant increase in traffic compared with existing volumes. Therefore, a permanent increase in the ambient noise level is not expected, and impacts would be less than significant.

Impact NV-4: Would the Project Result in a Substantial Temporary or Periodic Increase in Ambient Noise Levels in the Project Vicinity, above Levels Existing without the Project?

Construction

As referenced in Impact 4.9-1, temporary noise increases would occur from construction of the proposed wastewater treatment facility, pump stations, and pipeline network. Table 4.9-7 shows that noise levels at receivers ST-1 and ST-2 would increase by 1 and 3 dB, respectively, during construction of the waste water treatment facility. Noise levels at all other receivers would not exceed the existing ambient noise levels. Temporary noise increases associated with construction of the proposed pipeline network could be as high as 89 dBA, which would be a 21 to 36 dB increase above existing ambient noise levels. Furthermore, periodic testing of the emergency power generators associated with the pump stations would cause temporary increases in noise levels at receivers located within the City. Based on current Project plans, no need for pump stations has been identified within the County.

County

Sensitive receivers located within the County's jurisdiction would most likely be similar acoustically to receiver ST-3. The ambient noise level measured at receiver ST-3 was 53 dBA L_{eq} . A temporary noise increase of 27 dB over the ambient conditions would be considered a substantial increase. As stated in Impact 4.9-1, the County generally exempts construction, provided that it does not occur on weekdays between the hours of 7 p.m. and 7 a.m. or at any time on Sundays or holidays. However, the County requires mobile equipment not to exceed a maximum threshold of 75 dBA at single-family residential land uses. Because the increase over the existing ambient noise level is on the order of 36 dB and the calculated noise level exceeds the 75 dBA threshold, impacts would be considered significant and unavoidable.

City

Noise levels at sensitive receivers located within the City's jurisdiction are listed in Table 4.9-5. Noise levels from construction of the proposed wastewater treatment facility would exceed the ambient noise level at the two closest sensitive receivers (ST-1 and ST-2) by 1 to 3 dB, respectively. Temporary noise increases of this magnitude would be just at the threshold of perceptibility and therefore would not be considered substantial. Construction of the proposed pipeline along local roadways could cause a temporary noise increase ranging from 21 to 36 dB over existing ambient conditions. As stated in Impact NV-1, the City exempts construction activity, provided that it does not occur on weekdays between the hours of 7 p.m. and 7 a.m., before 8 a.m. or after 5 p.m. on Saturday, or at any time on Sundays or holidays. In addition, the exposure to noise from pipeline construction would be for a relatively short duration at any individual sensitive receptor. However the temporary noise increase would be considered a substantial increase. Therefore, impacts associated with temporary increases would be considered significant and unavoidable.

As discussed in Impact 4.9-1, backup generators would need to be regularly tested and maintained in conformance with NFPA Standard 110. Additional refueling and generator testing would be performed as needed based on inspections by the City's contractor. An unhoused, unmuffled 250-horsepower generator at a distance of 50 feet would generate a noise level of approximately 107 dBA L_{eq} (Cummins Power Generation msp-1026g). Therefore, a noise level of this magnitude, while temporary and periodic, would be clearly audible at noise-sensitive receivers within the Project

area. However, self-contained sound-reducing enclosures would reduce noise levels to 73 dBA (Cummins Power Generation msp-1026g). Ambient noise levels at sensitive receiver location ST-1 were measured at 68 dBA. Noise levels associated with an enclosed, muffled generator would exceed the measured ambient noise by 5 dB. An increase of this magnitude would be noticeable but would not exceed any of the City's thresholds. To ensure that noise from emergency generators ~~does not result in a temporary substantial increase in noise levels~~~~does not exceed the City's thresholds~~, the proposed Project would include MM NV-2, below.

Impact NV-5: Would the Project Be Located within an Airport Land Use Plan Area or, where Such a Plan Has Not Been Adopted, within 2 miles of a Public Airport or Public Use Airport and Expose People Residing or Working in the Project Area to Excessive Noise Levels?

The closest airport to the proposed Project is Santa Monica Municipal Airport, located approximately 13 miles southeast of the Project site. Therefore, the proposed Project would not expose people to excessive noise associated with an airport. No impact would occur.

Impact NV-6: Would the Project Be Located in the Vicinity of a Private Airstrip and Expose People Residing or Working in the Project Area to Excessive Noise Levels?

The proposed Project would not be located in proximity to any private airstrips. Although a few private helipads are located close to the Project site, these helipads would not expose employees at the proposed wastewater treatment facility to excessive noise. Impacts would be less than significant.

4.9.4. Mitigation Measures

Although no feasible mitigation has been identified to reduce temporary, but significant, construction noise impacts on noise-sensitive receptors in the Project area to a less-than-significant level, the measures below are proposed to reduce construction noise impacts (see Impact NV-1, above) to the extent practicable.

MM NV-1: The construction contractor shall use appropriate noise-control measures to reduce construction noise levels to the extent feasible. Noise controls could include any of the following, as appropriate:

- Construction hours shall be in compliance with City and County noise ordinances during construction within each respective jurisdictional boundary.
- Best available noise-control techniques (including mufflers, intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds) shall be used for all equipment and trucks to minimize construction noise impacts.
- If impact equipment (e.g., jackhammers and pavement breakers) is used during Project construction, hydraulically or electrically powered equipment shall be used wherever feasible to avoid the noise associated with compressed-air exhaust from pneumatically powered tools. However, where the use of pneumatically powered tools is unavoidable, an exhaust muffler on the compressed-air exhaust shall be used (a muffler can lower noise levels from the exhaust by up to about 10 dBA). External jackets on the tools themselves

shall be used, where feasible, which could reduce noise by 5 dBA. Quieter procedures, such as drilling rather than impact equipment, shall be used whenever feasible.

- Pile holes shall be pre-drilled wherever feasible to reduce potential noise and vibration impacts.
- Stationary noise sources shall be located as far from sensitive receptors as feasible. If they must be located near receptors, adequate muffling (with enclosures where feasible and appropriate) shall be used to ensure that local noise ordinance limits are met to the extent feasible. Enclosure openings or venting shall face away from sensitive receptors. If any stationary equipment (e.g., ventilation fans, generators, dewatering pumps) is required, such equipment shall comply with the daytime and nighttime noise limits specified in pertinent noise ordinances to the extent feasible.
- Material stockpiles as well as maintenance/equipment staging and parking areas shall be located as far as feasible from residential and school receptors.
- Proposed jack-and-bore pits shall be located as far from sensitive receptors as technically feasible.
- A designated Project liaison shall be responsible for responding to noise complaints during the construction phases. The name and phone number of the liaison shall be conspicuously posted at construction areas and on all advance notifications. This person shall take steps to resolve complaints, including periodic noise monitoring if necessary. Results of noise monitoring shall be presented at regular meetings with the construction contractor, and the liaison shall coordinate with the construction contractor to modify, to the extent feasible, any construction activities that generate excessive noise levels.

MM NV-2: All emergency generators shall be housed and muffled with acoustically rated enclosures to reduce noise levels to the greatest extent possible.

4.9.5. Unavoidable Significant Adverse Impacts

Even with implementation of best available noise-control technologies for construction equipment, the temporary noise impacts associated with construction of the proposed pipeline network would be considered significant and unavoidable.

4.9.6. Cumulative Impacts

Regarding noise from construction, the cumulative analysis of impacts is limited to the time when the construction activities occur and the proximity of other projects that are under construction or other sources of noise in the immediate vicinity of proposed Project construction activities. Construction impacts do not occur once construction has ceased. Reasonably foreseeable future projects could contribute to a cumulatively significant impact but only if located in proximity to the Project site. Because the proposed Project's pipeline system would extend throughout the network of roadways surrounding the proposed wastewater treatment facility, it is possible that construction of some projects may overlap with construction of the proposed Project.

Reasonably foreseeable future projects located within the County's jurisdiction would not be located near improvements associated with the proposed Project. Therefore, impacts within the County's jurisdiction would not be considered cumulatively considerable.

Eight reasonably foreseeable future projects are under planning review within the City of Malibu and located in proximity to the proposed Project. Construction of the proposed Project could overlap with construction of these reasonably foreseeable future projects, which could result in a cumulative noise effect. Because construction of these projects could overlap with construction of the proposed Project, this cumulative effect would be considered cumulatively considerable. Therefore, the cumulative effect of past, present, and reasonably foreseeable future projects associated with construction within the City of Malibu would be significant and unavoidable.

Vibration impacts are often associated with construction activities. Reasonably foreseeable future projects could contribute to a cumulatively significant impact but only if located in proximity to the Project site. As with construction noise, reasonably foreseeable future projects located within the County's jurisdiction would not be close enough to result in a cumulatively considerable effect associated with vibration. Therefore, vibration impacts would not be considered cumulatively considerable.

One reasonably foreseeable future project, the Rancho Malibu Hotel, is under planning review within the City of Malibu. The hotel would be located within proximity to the proposed Project, which could result in a cumulatively considerable impact. However, construction of both projects would have to overlap and occur simultaneously to result in a cumulatively considerable vibration impact. Furthermore, the reasonably foreseeable future project is farther from vibration-sensitive receivers, which would result in vibration attenuating to a level that would be well below the threshold of perception. Therefore, the cumulative effect associated with vibration from past, present, and reasonably foreseeable future projects would be less than significant.