4.9 NOISE

This section provides information on noises that occur or could potentially occur within the Park as a result of Program Actions. This section also includes specific information on the existing noise environment at the Park and surrounding areas and potential impacts to potential noise receptors. Section 4.0, Environmental Analysis, provides a description of DPR's analytical methodology that is applied to each resource category, including Noise, from a program and area-specific perspective.

4.9.1 EXISTING CONDITIONS

The primary noise source in the Project area is surface traffic on East Empire Street, which provides primary access to the Park, and SR 174. East Empire Street traverses the Park in an east-west direction. North of Empire Street, SR 174 traverses the Park from northwest to southeast and then extends along the eastern boundary of the Park and the Union Hill Area (see Section 4.11, Transportation, Circulation, and Traffic, for additional information on Nevada County's roadway system in the vicinity of the Park).

4.9.1.1 Methods

Bollard Acoustical Consultants staff conducted a short-term ambient noise survey on January 21, 2009. The ambient noise survey was conducted at 12 locations within the Park near 10 Remediation Areas, or along Park boundaries near existing residential uses. The surveys, which were conducted between 9:30 a.m. and 1:00 p.m., ranged in duration from 5 to 15 minutes at each site. During peak traffic hours, ambient noise levels could be higher in areas of the Park adjacent to East Empire Street or SR 174, but not dramatically. In addition, many areas within the Park are removed from local roadways and surrounded by natural vegetation suppressing much sound outside the Park boundary. The midday period was selected to provide a reasonable representation of ambient noise conditions during the periods of the day during which a majority of park usage occurs. Due to the steady-state nature of the noise environment at each location, the short-term measurement durations were adequate to quantify ambient conditions.

The noise measurement locations are identified on Figure 4.9-1, Noise Measurement Locations.

A Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meter was used for the ambient noise level measurement survey. The meter was calibrated before and after use with an LDL Model CAL200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4 2006).

The noise level meter was programmed to record the maximum and average hourly noise levels during the survey.

4.9.1.2 Fundamentals and Terminology

Noise is often described as unwanted sound. Sound is defined as any pressure variation in air that the human ear can detect. If the pressure variations occur frequently enough, they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second, called Hertz (Hz).

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. As a result, Bell Telephone Laboratories devised the decibel scale in the early 1900s (Nolls 2001). The decibel scale uses the hearing threshold (20 micropascals of pressure), as a point of reference, defined as 0 decibels (dB). Other sound pressures are then compared to the reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB; changes in decibel levels correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level, sound duration, time of occurrence, and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and is typically approximated by the A-weighing network. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives noise. For this reason, the dBA has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of dBA levels. Table 4.9-1, Acoustical Terminology, contains definitions of acoustical terminology used in this section. Table 4.9-2, Typical A-Weighted Sound Levels of Common Noise Sources, shows examples of noise levels for several common noise sources and environments.

4.9.1.3 Noise Exposure and Community Noise

Community noise is commonly described in terms of the ambient noise level. A common statistical tool to measure the ambient noise level is the average (L_{eq}), which corresponds to a steady-state dBA containing the same total energy as a time varying signal over a given time period (usually 1 hour). The L_{eq} is the foundation of the composite noise descriptor that represents L_{dn}, and shows very good correlation with community response to noise.

TABLE 4.9-1
ACOUSTICAL TERMINOLOGY

Term	Definition
Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
Attenuation	The reduction of an acoustic signal.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and noise occurring during nighttime hours (10 p.m. - 7 a.m.) weighted by a factor of 10 prior to averaging.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz.
Hertz	The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second
L_{dn}	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
L_{eq}	Equivalent or energy-averaged sound level.
L_{max}	The highest root-mean-square (RMS) sound level measured over a given period of time.
Loudness	A subjective term for the sensation of the magnitude of sound.
Noise	Unwanted sound.
SEL	A rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy of the event into a 1-second time period.
Threshold of Hearing	The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.
Threshold of Pain	Approximately 120 dB above the threshold of hearing.

Source: Bollard Acoustical Consultants, Inc.

The L_{dn} is based upon the average noise level over a 24-hour day, with a +10 dB weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The additional decibel weight is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment. Where short-term noise sources are an issue, noise impacts can be assessed in terms of maximum noise levels, hourly averages, or other statistical descriptors.

TABLE 4.9-2
TYPICAL A-WEIGHTED SOUND LEVELS OF COMMON NOISE SOURCES

Decibels	Description
130	Threshold of pain
120	Jet aircraft take-off at 100 feet
110	Riveting machine at operators position
100	Shotgun at 200 feet
90	Bulldozer at 50 feet
80	Diesel locomotive at 300 feet
70	Commercial jet aircraft interior during flight
60	Normal conversation speech at 5 - 10 feet
50	Open office background level
40	Background level within a residence
30	Soft whisper at 2 feet
20	Interior of recording studio

Source: Bollard Acoustical Consultants, Inc. & Egan, Architectural Acoustics, McGraw Hill 1988.

4.9.1.4 Effects of Noise on People

The effects of noise on people can be placed into three categories:

1. Subjective effects of annoyance, nuisance, dissatisfaction;
2. Interference with activities such as speech, sleep, learning; and
3. Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists, and different tolerances to noise tend to develop based on an individual's past experiences.

An important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted or ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise would be judged by those hearing it. With regard to increases in dBA noise levels for similar sources, the following relationships generally hold:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference;

- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10 dBA change is subjectively heard as approximately a doubling in loudness, and can cause adverse response.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. The human ear perceives sound in a non-linear fashion; hence the decibel scale was developed. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, but rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA the combined sound level would be 53 dBA, not 100 dBA.

4.9.1.5 Effects of Single Event Noise on Communication and Sleep

A single event is an individual distinct loud activity, such as passage of a truck or an individual aircraft. Noise sources quantified in terms of 24-hour-averaged descriptors, such as L_{dn} or CNEL, can understate the potential for speech interference or sleep disturbance associated with individual loud events due to the averaging process.

Noise specialists have conducted extensive studies regarding the effects of single-event noise on sleep disturbance, with the SEL metric being the most common used for such assessments. SEL represents the entire sound energy of a given event normalized into a one-second period regardless of event duration. As a result, the single-number SEL metric contains information pertaining to both event duration and intensity. Another descriptor utilized to assess single-event noise is the L_{max} associated with the event. A problem with utilizing L_{max} to assess single events is that the duration of the event is not considered.

4.9.1.6 Noise Attenuation

Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate between 6 dBA for hard sites and 7.5 dBA for soft sites for each doubling of distance from the reference measurement. Hard sites are those with a reflective surface between the source and the receiver such as parking lots or smooth bodies of water. No excess ground attenuation is assumed for hard sites and the changes in noise levels with distance (drop-off rate) is simply the geometric spreading of the noise from the source. Soft sites have an absorptive ground surface such as soft dirt, grass or scattered bushes and trees. In addition to geometric spreading, excess ground attenuation and atmospheric absorption can be combined and generalized for “standard day” atmospherics as being 1.5 dBA per thousand feet.

4.9.1.7 Fundamentals of Vibration

Vibration is similar to noise because they both involve a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that noise is generally

considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to the vibration would depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities in inches per second. Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of peak particle velocities. Because the Program Actions being considered are not considered highly pulsed in nature (such as pile driving, for example), vibration impacts are qualitatively assessed in this section.

4.9.1.8 Noise Sensitive Receptors

A noise sensitive receptor is defined as any person, wildlife, and/or an existing use that has sensitivity to noise. Typically, such receptors are considered to be residential uses, but interiors of classrooms and office spaces are also considered noise-sensitive.

The Park covers approximately 856 acres. Land uses surrounding the Park include open space, limited commercial, industrial, and residential uses. Of these uses, open space and residential contain noise-sensitive receptors. The greatest concentration of residences in the vicinity of the Park is near the northern and northwestern Park boundaries, along East Empire Street and SR 174. Some of the residences are within 50 to 100 feet of the Park boundaries (see Figure 4.9-1).

As discussed in subsection 4.9.1.1, "Methods," above, the Project Proponents measured ambient noise at 12 Park locations on January 21, 2009. Table 4.9-3, Existing Daytime Ambient Noise Levels, provides the noise level measurement results.

TABLE 4.9-3
AMBIENT NOISE MONITORING STATIONS AND EXISTING DAYTIME AMBIENT NOISE LEVELS

Ambient Noise Monitoring Locations	Location	L_{eq} (dB)	L_{max} (dB)
A	Mine Yard and Stamp Mill Area (Area 1)	42	46
B	Conveyance Corridor and Adit Area (Remediation Area 3)	42	49
C	Sand Dam Site A (Remediation Area 4)	44	48
D	Sand Dam Site B (Remediation Area 4)	50	57
E	Pennsylvania Mine	42	44
F	WYOD Tailings Pile	43	43
G	Magenta Drain (Remediation Area 6)	50	56
H	Stacy Lane Pond Area (Remediation Area 7)	45	47
I	Boundary of Residences above Stacy Lane Pond	53	58
J	On-site Residences Grounds (Remediation Area 9)	42	47
K	Trails (Remediation Area 10)	42	44
L	Red Dirt Pile Area	41	46

Source: Bollard Acoustical Consultants, Inc.

The ambient noise survey results shown in Table 4.9-3 indicate that existing noise conditions at interior Park locations and boundaries of residential land uses are low, with daytime ambient noise levels ranging from the low 40s to the low 50s. Maximum noise levels were typically 2 to 7 dB higher than measured average noise levels due to noise-generating activities particular to a survey location or activity concurrent with the survey activity observed during the sample (i.e. local traffic, distant aircraft over-flight, Park visitors, etc.). Sources of noise most prevalent at noise survey locations were local and distant roadway traffic. None of the noise survey locations were conducted adjacent to roadways, such as East Empire Street or SR 174. At those locations, ambient noise levels would be higher because of vehicle traffic.

4.9.2 REGULATORY SETTING

4.9.2.1 Federal

Federal regulations establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under Title 40 Code of Federal Regulations (40 CFR), Part 205, Subpart B. The federal truck pass-by noise standard is 80 dBA at 15 meters from the vehicle pathway centerline. These controls are implemented through regulatory controls on truck manufacturers.

4.9.2.2 State

The California Code of Regulations (CCR) has guidelines for evaluating the compatibility of various land uses as a function of community noise exposure, as shown in Table 4.9-4, Land Use Compatibility for Community Noise Environment, below (21 CCR § 5014). The state of California also establishes noise limits for vehicles licensed to operate on public roads. For heavy trucks, the state pass-by standard is consistent with the federal limit of 80 dBA.

TABLE 4.9-4
LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENT

Land Use Category	Community Noise Exposure L_{dn} or CNEL (dBA)													
	50		55		60		65		70		75		80	
Residential – Low Density Single Family, Duplex, Mobile Home														
Residential – Multi Family														
Transient Lodging – Motel/Hotel														
Schools, Libraries, Churches, Hospitals, Nursing Homes														
Auditoriums, Concert Halls, Amphitheaters														
Sports Arena, Outdoor Spectator Sports														
Playgrounds, Neighborhood Parks														
Golf Courses, Riding Stables, Water Recreation, Cemeteries														
Office Buildings, Business, Commercial, and Professional														

Land Use Category	Community Noise Exposure L_{dn} or CNEL (dBA)													
	50		55		60		65		70		75		80	
Industrial, Manufacturing, Utilities, Agriculture														

	Normally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
	Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
	Normally Unacceptable	New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.
	Clearly Unacceptable	New construction or development generally should not be undertaken.

Source: State of California, Governor's Office of Planning and Research, 1998, General Plan Guidelines.

The state pass-by standard for light trucks and passenger cars (less than 4.5 tons, gross vehicle rating) is also 80 dBA at 15 meters from the centerline. These standards are implemented through controls on vehicle manufacturers and by legal sanction of vehicle operators by state and local law enforcement officials.

The state has also established noise insulation standards for new multi-family residential units, hotels, and motels that would be subject to relatively high levels of transportation-related noise. These requirements are collectively known as the California Noise Insulation Standards (24 CCR). The noise insulation standards set forth an interior standard of DNL 45 dBA in any habitable room. They require an acoustical analysis demonstrating how dwelling units have been designed to meet this interior standard where such units are proposed in areas subject to noise levels greater than DNL 60 dBA. Title 24 (24 CCR) standards are typically enforced by local jurisdictions through the building permit application process. Because this Project does not propose any new residential units, the 24 CCR standards of the state would not apply (24 CCR).

4.9.2.3 Local

As a state agency, DPR is exempt from local regulations, including general plans, specific plans, and zoning ordinances, to the extent that such requirements conflict with DPR's own General Plan for the Park (California Constitution Article XI Section 7). Due to the proximity of residences and sensitive noise receptors (e.g. students and faculty present in schools located along potential project routes) in the County and/or City jurisdiction, their goals, objectives, policies and noise regulations would apply to Program Actions to the extent applicable. In addition, DPR must comply with the Park's General Plan, as well as applicable state and federal rules and regulations governing historic buildings, structures, and districts.

General Plans recognize that different types of land uses have different sensitivities toward their noise environment; residential areas are generally considered to be the most sensitive land use type to noise; industrial/commercial areas are generally considered to be the least sensitive. Noise Ordinances provide the specific standards and procedures for addressing particular noise sources and activities. The County's and the City's noise regulations and standards typically apply to the land uses within their respective jurisdictions near the Park.

Nevada County General Plan

Policy 9.5 of the County's General Plan Noise Element (Nevada County 1996), which is the only County policy applicable to this Project, encourages heavy truck traffic to those routes outside residential areas.

City of Grass Valley General Plan

The City of Grass Valley's General Plan recognizes noise pollution as a significant source of environmental degradation. The City's General Plan Noise Element identifies community noise goals and establishes implementation actions to reduce noise pollution. The applicable implementation actions relate to new transportation noise sources that could impact sensitive receptors within the City. Table 4.9-5, Exterior Noise Limits, and Table 4.9-6, Maximum Allowable Noise Exposures to Sensitive Receptors from Transportation Noise Sources, provide the applicable performance standards for transportation noise sources. The goal and implementation actions that apply to the Project are provided below:

- Goal 1-NG: Protect Grass Valley's relatively quiet environment from unnecessary, annoying and potentially damaging noise.

Noise Implementation Actions and Strategies

- 6-NI: Require mitigation of noise created by new transportation noise sources so as not to exceed the noise levels specified in Table 4.9-5 at designated outdoor activity areas and interior spaces of existing noise-sensitive land uses.
- 8-NI: Require an acoustical analysis and appropriate mitigation measures where new transportation noise sources are likely to produce noise levels exceeding the standards of Table 4.9-5 at existing or planned noise-sensitive uses.

TABLE 4.9-5
EXTERIOR NOISE LIMITS

Zoning Districts	Time Period	Noise Level (dBA)	
		L_{eq}	L_{max}
RURAL			
"A1" "TPZ"	7 am – 7 pm	55	75
"AE" "OS"	7 pm – 10 pm	50	65
"FR" "IDR"	10 pm – 7 am	40	55
RESIDENTIAL AND PUBLIC			
"RA" "R2"	7 am – 7 pm	55	75
"R1" "R3"	7 pm – 10 pm	50	65
"P"	10 pm – 7 am	45	60
COMMERCIAL AND RECREATION			
"C1" "CH" "CS"	7 am – 7 pm	70	90
"C2" "C3" "OP" "REC"	7 pm – 7 pm	65	75
BUSINESS PARK			
"BP"	7 am – 7 pm	65	85
	7 pm – 7 pm	60	70
INDUSTRIAL			
"M1" "M2"	anytime	80	90

Source: Quad Knopf, 1999.

TABLE 4.9-6
MAXIMUM ALLOWABLE NOISE EXPOSURES TO SENSITIVE RECEPTORS FROM TRANSPORTATION NOISE SOURCES

Land Use	L_{dn}/CNEL, dB	Interior Spaces	
		L_{dn}/CNEL, dB	L_{eq}, dB[a]
Residential	60[b]	45	--
Transient Lodging	60[c]	45	--
Hospitals, Nursing Homes	60[b]	45	--
Theaters, Auditoriums, Music Halls	--	--	35
Churches, Meeting Halls	60[b]	--	40
Office Buildings	--	--	45
Schools, Libraries, Museums	--	--	45
Playgrounds, Neighborhood Parks	70	--	--

[a] As determined for a typical worst-case hour during periods of use.

[b] Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn}/CNEL using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB L_{dn}/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.

[c] In the case of hotel/motel facilities or other transient lodging, there may be no designated outdoor activity areas (e.g., pool areas). In such cases, only the interior noise level criterion will apply.

Source: Quad Knopf, 1999.

City of Grass Valley Municipal Code

The City of Grass Valley has adopted noise ordinances in Chapter 8.28 of the Municipal Code. These ordinances do not contain quantitative noise standards, but do make it unlawful to willfully make or continue a loud, unnecessary, or unwanted noise which disturbs the peace or quiet of a neighborhood, or which causes discomfort or annoyance to a reasonable person of normal sensitivity residing in the area. The Grass Valley Municipal Code would also apply to the Program Actions, if they were to occur within 500 feet of a residential zone. The Municipal Code prohibits construction between the hours of 7:00 p.m. and 7:00 a.m., and on a Sunday or legal holiday.

4.9.2.4 Criteria for Assessing Significance of Project-Related Noise Increases

In addition to comparing Project-generated noise levels against applicable noise standards, noise impacts are also assessed by comparing ambient noise levels with the Project against those which would be present without the Project. Because the human ear registers a 3 dB change in noise levels for similar sources as being barely perceptible, and a 5 dB change as clearly noticeable, a common practice has been to utilize either a 3 or 5 dB threshold for determining significance in project-related changes in noise environments. However, such an approach is subject to interpretation and can lead to differences in development or application of appropriate noise significance criteria.

The 1992 findings of the Federal Interagency Committee on Noise (FICON) provide official guidance as to the significance of changes in ambient noise levels from studies that relate aircraft noise levels to the percentage of persons highly annoyed by the noise. Annoyance is a summary measure of the general adverse reaction of people to noise that generates speech interference, sleep disturbance, or interference with the desire for a tranquil environment. Although the FICON findings were specifically developed to assess aircraft noise impacts, noise specialists believe that they are equally applicable to all sources of noise described in terms of cumulative noise exposure metrics such as the L_{dn} or CNEL. The FICON findings have been used extensively as defensible significance criteria in cases where the noise policies of local jurisdictions do not contain criteria for assessing project-related changes in ambient noise environments. Table 4.9-7, Criteria for Assessing Significance of Project-Related Noise Increases, provides the significance criteria for increases in the ambient noise environment.

TABLE 4.9-7
CRITERIA FOR ASSESSING SIGNIFICANCE OF PROJECT-RELATED NOISE INCREASES

Ambient Noise Level Without Project (Ldn)	Significant Impact Assumed to Occur if the Project Increases Ambient Noise Levels By:
<60 dB	+ 5.0 dB or more
60-65 dB	+ 3.0 dB or more
>65 dB	+1.5 dB or more

Source: Federal Interagency Committee of Noise (FICON 1992).

4.9.3 THRESHOLDS OF SIGNIFICANCE

The following thresholds have been prepared based on the State CEQA Guidelines (Appendix G) and Section 15065 of the State CEQA Guidelines. The Project would have a significant impact on noise if it will:

- Result in exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. For this project, exceedance of the noise level standards of Table 4.9-5 or 4.9-6 would constitute a noise impact.
- Result in exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels. A peak particle velocity of 0.2 inches per second is commonly considered to be the threshold of annoyance for vibration, with peak particle velocities of 2.0 required for damage to structures.
- Result in a substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project. The noise level thresholds contained in Table 4.9-7 are used to assess significance of changes in ambient noise environments for transportation and non-transportation noise sources.

Therefore, a permanent 5 dB increase in ambient noise levels would be appropriate for a finding of significance.

- Result in a substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project. The noise level thresholds contained in Table 4.9-7 are used to assess significance of changes in ambient noise environments for transportation and non-transportation noise sources. Therefore, a permanent 5 dB increase in ambient noise levels would be appropriate for a finding of significance.
- For a project located within an airport land use plan area, or, where such a plan has not been adopted, in an area within 2 miles of a public airport or public use airport, expose people residing or working in the area to excessive noise levels.
- For a Project located in the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

4.9.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.9.4.1 Programmatic and Area-Specific EIR Impact Assessment

To identify potentially significant impacts resulting from Program Actions, each proposed Program Action was assessed against the significance thresholds listed in Section 4.9.3. Table 4.0-1, Proposed Program Actions and Anticipated Project Actions at the Park, provides a summary of which Project Actions that would be necessary to implement Program Actions and Table 4.0-2, Summary of Results of Area-Specific Impact Findings for the 10 Remediation Areas, assesses reasonably foreseeable impacts that could occur to each of the identified environmental resources. The Program Actions are described in detail in Section 2.0 of this Draft PEIR. The discussion below lists each type of potential noise impact and provides an analysis of potential impacts from each Program Action, assesses the significance of each impact, and if necessary, identifies measures that would mitigate impacts to a level below significance. In the course of the impact assessment, it became apparent that program and area-specific impacts do not differ for Noise. Therefore, the impacts discussed below apply to both Program Actions and to area-specific activities.

Table 4.9-8, Program EIR Noise Impacts Analysis, provides a summary of the significance determinations for each Program Action. Table 4.9-9, Area-Specific Noise Impacts Analysis, provides a description of the noise-related impacts that could potentially occur as a result of Program Actions at the Park.

TABLE 4.9-8
PROGRAM EIR NOISE IMPACTS ANALYSIS

	Thresholds of Significance					
	Exposure of people to noise in excess of established standards	Exposure of people to excessive groundborne vibration or noise	Substantial permanent increase in ambient noise levels	Substantial temporary or periodic increase in ambient noise levels	Exposure of people to excessive public airport noise	Exposure of people to excessive private airstrip noise
CHARACTERIZATION						
Characterization(e.g., soil sampling)	PS	NI	NI	PS	N/A	N/A
EVALUATION						
Evaluation (e.g., bench scale testing)	NI	NI	NI	NI	N/A	N/A
INTERIM OPTIONS						
Fences	NI	NI	NI	NI	N/A	N/A
Signs	NI	NI	NI	NI	N/A	N/A
Installation of Zeolite Treatment Cells	NI	NI	NI	NI	N/A	N/A
Installation of Straw Wattles	NI	NI	NI	NI	N/A	N/A
Use of soil tackifiers/binding agents	NI	NI	NI	NI	N/A	N/A
Construction of temporary plant at Magenta Drain	PSU	NI	LS	PS	N/A	N/A
REMEDIATION OPTIONS						
Selective Removal and/or Replacement of Surface Materials	PSU	NI	NI	PS	N/A	N/A
Complete Removal and/or Replacement of Surface Materials	PSU	NI	NI	PS	N/A	N/A
Placement of Removed Soil or Materials within the Park	PSU	NI	NI	PS	N/A	N/A
Placement of Cover over Selected Areas	PSU	NI	NI	PS	N/A	N/A
Use of Institutional Controls	NI	NI	NI	NI	N/A	N/A
Implement Active Treatment Measures	PSU	NI	PSU	PSU	N/A	N/A
Implement Passive Treatment Measures	PSU	NI	NI	PS	N/A	N/A
In-situ Covers Establishment and Stabilization	PSU	NI	NI	PS	N/A	N/A

	Thresholds of Significance					
	Exposure of people to noise in excess of established standards	Exposure of people to excessive groundborne vibration or noise	Substantial permanent increase in ambient noise levels	Substantial temporary or periodic increase in ambient noise levels	Exposure of people to excessive public airport noise	Exposure of people to excessive private airstrip noise
Stormwater Collection and Diversion Structures	PSU	NI	NI	PS	N/A	N/A
Other Water Treatment Measures	LS	NI	NI	PS	N/A	N/A
Remediation of Structures	PSU	NI	NI	PS	N/A	N/A
Use of Engineering Controls to prevent access	LS	NI	NI	PS	N/A	N/A
Maintenance and Enhancement of Existing Cover	LS	NI	NI	PS	N/A	N/A

Notes:
PSU = Potentially Significant and Unavoidable Impact
PS = Potentially Significant Impact
LS = Less than Significant Impact – with Project Specific and Standard Project Requirements
LSM = Less than Significant Impact with Mitigation Incorporated
NI = No Impact
NA = Not Applicable

TABLE 4.9-9
AREA-SPECIFIC NOISE IMPACTS ANALYSIS

	Thresholds of Significance					
	Exposure of people to noise in excess of established standards	Exposure of people to excessive groundborne vibration or noise	Substantial permanent increase in ambient noise levels	Substantial temporary or periodic increase in ambient noise levels	Exposure of people to excessive public airport noise	Exposure of people to excessive private airstrip noise
REMEDIATION AREAS						
Remediation Area 1: Mine Yard and Stamp Mill Area	PSU	NI	NI	PS	NI	NI
Area 2: Cyanide Plant Area	PSU	NI	NI	PS	NI	NI
Area 3: Conveyance Corridor and Adit	PSU	NI	NI	PS	NI	NI

	Thresholds of Significance					
	Exposure of people to noise in excess of established standards	**Exposure of people to excessive groundborne vibration or noise**	**Substantial permanent increase in ambient noise levels**	**Substantial temporary or periodic increase in ambient noise levels**	**Exposure of people to excessive public airport noise**	**Exposure of people to excessive private airstrip noise**
Project Area						
Area 4: Sand Dam Area	PSU	NI	NI	PS	NI	NI
Area 5: Historic Mine and Mill Areas	PSU	NI	NI	PS	NI	NI
Area 6: Magenta Drain Area	LSM	NI	PSU	PSU	NI	NI
Area 7: Stacy Lane Pond Area	PSU	NI	PSU	PSU	NI	NI
Area 8: Historic Grounds Area	PSU	NI	NI	PS	NI	NI
Area 9: Residences and Residences' Yards Areas	PSU	NI	LS	PS	NI	NI
Area 10: Trails Areas	PSU	NI	PSU	PSU	NI	NI

Notes:
PSU = Potentially Significant and Unavoidable Impact
PS = Potentially Significant Impact
LS = Less than Significant Impact – with Project Specific and Standard Project Requirements
LSM = Less than Significant Impact with Mitigation Incorporated
NI = No Impact
NA = Not Applicable

Impact 4.9-1: Program Actions Could Result in Exposure of Persons to, or Generation of, Noise Levels in Excess of Standards Established in Local General Plan, Noise Ordinance, or Applicable Standards of Other Agencies

Implementation of several Program Actions would result in the creation of noise at receptors outside the Park boundary. Project Actions necessary to complete Program Actions identified in Section 2.0 and Table 4.0-1 that could result in excessive noise levels include:

- Operation of heavy construction equipment;

- Transportation of contaminated soils leaving the Park and importation of clean fill material entering the Park;
- Mobilization and demobilization of heavy construction equipment to the Park;
- Demolition and/or removal of any structures, including temporary facilities;
- Importation of supplies and materials that could be used for remediation activities;
- Temporary and permanent fencing installation;
- Grading activities;
- Boring activities;
- Excavation activities;
- Blasting activities;
- Scarifying activities;
- Dredging and sediment removal;,
- Stormwater BMP installation and maintenance activities;
- Removal of trees and other vegetation;
- Construction of ancillary structures, including utilities for either a temporary or permanent active water treatment facility;
- Construction and installation of permanent exclusion barriers;
- Construction and maintenance of access roads; and/or
- Monitoring activities.

Project Actions necessitate the use of off-site truck trips (e.g. importation or exportation of materials) increasing noise levels along roads utilized for implementation of the Project. Table 4.9-10, Typical Noise Levels from Construction Equipment, shows typical noise levels for the operation of various types of construction equipment. Noise generated by Project implementation would depend on the type of equipment, number of pieces of equipment operating concurrently, and number of off-site truck trips.

TABLE 4.9-10
TYPICAL NOISE LEVELS FROM CONSTRUCTION EQUIPMENT

Construction Equipment	Noise Level (dBA, L_{eq} at 50 feet)
Dump Truck	88
Portable Air Compressor	81
Concrete Mixer (Truck)	85
Scraper	88
Jack Hammer	88

Construction Equipment	Noise Level (dBA, L_{eq} at 50 feet)
Dozer	87
Paver	89
Generator	76
Backhoe	85

Source: Cuniff, Environmental Noise Pollution, John Wiley and Sons, 1977.

Whether a significant impact could result from noise generated during Project Actions would depend on ambient noise conditions at receptor locations near Project Actions, the location and time of day Project Actions occurred, proximity of Project Actions to receptors, the degree of natural or man-made shielding present between the noise source and receptor, and atmospheric conditions. A significant noise impact to a receptor would occur if Project Action noise levels exceed 55 dB L_{eq} at that receptor location. Assuming a potential maximum noise exposure level of 90 dB L_{eq} from Project Actions at a reference distance of 50 feet, a 6 dB decrease per doubling of distance for geometric spreading, and a 1.5 dB decrease per thousand feet for excess ground attenuation and atmospheric absorption, the distance to the 55 dB L_{eq} noise contour would be approximately 2,000 feet.

A 55 dB L_{eq} noise level threshold is appropriate because it is the daytime noise limit applicable to residential uses by both the County and the City, which surround the Park.

If line of sight between the noise source and receiver (i.e., residence, visitor center) is interrupted by intervening topography or structures, a noise reduction of at least 5 dB would result. With dense intervening vegetation, such as that present in many Park areas, an additional 5 dB of attenuation could be realized. With the assumed -10 dB shielding for topography and vegetation, the distance to the 55 dB L_{eq} contour would be reduced to approximately 800 feet. Due to the extensive topographic relief in some areas of the Park actual noise levels would be considerably lower.

Standard Project Requirement NOISE-1 will be incorporated into the Project to reduce noise impacts. Standard Project Requirement NOISE-1 states that Project Actions will be limited to the daylight hours, Monday through Friday. However, weekend work could be implemented to accelerate construction or address emergency or unforeseen circumstances. If weekend work is necessary, no work will occur on those days before 8:00 a.m. or after 6:00 p.m. Further, NOISE-1 provides that internal combustion engines used for the implementation of Program Actions will be equipped with a muffler of a type recommended by the manufacturer. Equipment and trucks used for Project-related activities will utilize the best available noise control techniques (e.g., engine enclosures, acoustically attenuating shields or shrouds, intake silencers, ducts, etc.) whenever necessary. Finally, stationary noise sources and staging areas will be located as far from potential sensitive noise receptors, as possible. If they must be located near potential sensitive noise receptors, stationary noise sources will be muffled or shielded and/or enclosed within temporary sheds.

Sensitive noise receptors are located closer than 800 to 2,000 feet (depending on topographic and vegetative shielding); therefore, noise levels at the location of those receptors could exceed the 55 dB threshold. Table 4.9-11, Area-Specific Noise Impacts, provides a description of the land uses inside and outside of the Park that will experience noise levels above 55 dB L_{eq} at 800 feet and 2,000 feet to account for both minimum and maximum attenuation possibilities described above (see Figure 4.9-2, Area-Specific Noise Impact Contours). Implementation of the above Standard Project requirement would reduce noise levels; however, Project Action noise levels could not always be reduced to a level below the 55 dB threshold at receptor locations outside of the Park. Therefore this impact is considered potentially significant and unavoidable.

TABLE 4.9-11
AREA-SPECIFIC NOISE IMPACTS

Remediation Area	Land Uses within 55 dB L_{eq} Contours	
	800 Feet	2,000 Feet
Remediation Area 1: Mine Yard and Stamp Mill Area	Interior of Park	Interior of Park, Residential
Remediation Area 2: Cyanide Plant Area	Interior of Park	Interior of Park, Residential
Remediation Area 3: Conveyance Corridor and Adit Project	Interior of Park	Interior of Park
Remediation Area 4: Sand Dam Area	Interior of Park	Interior of Park, Commercial
Remediation Area 5: Historic Mine and Mill Sites	Interior of Park, Residential, Church	Interior of Park, Residential, Church, Commercial, School
Remediation Area 6: Magenta Drain Area	Interior of Park, Residential	Interior of Park, Residential, Commercial, Recreation
Remediation Area 7: Stacy Lane Pond Area	Interior of Park, Residential	Interior of Park, Residential, Commercial
Remediation Area 8: Historic Grounds Area	Interior of Park	Interior of Park, Residential
Remediation Area 9: Residences and Residences' Yards	Interior of Park	Interior of Park, Residential
Remediation Area 10: Trails	Interior of Park, Residential, Church	Interior of Park, Residential, Commercial, School, Church

Level of Significance Before Mitigation: Potentially Significant

Standard Project Requirement NOISE-1 would reduce the severity of potential impacts from remediation activities, but it is uncertain at this time if all noise impacts could be reduced to a less than significant level.

Mitigation Measures: No additional mitigation measures have been identified at this time.

Level of Significance After Mitigation: Potentially Significant and Unavoidable

Impact 4.9-2: Program Actions Could Result in a Substantial Permanent Increase in Ambient Noise Levels in the Park Vicinity

As described in Impact 4.9-1 above, Program Actions would result in increased noise levels. The increase in noise levels would depend on types and number of Project Action equipment and the amount of concurrent operation. Noise levels generated by Project Actions could exceed applicable noise standards. But, as described in Section 2.6.3, Project Description, Project Actions would be temporary in duration except for the water treatment facility. The active water treatment facility would be located within the interior of the Park. In addition, much of the noise generating equipment would be housed within a permanent structure.

Level of Significance Before Mitigation: Potentially Significant

NOISE-1 provides that internal combustion engines used for the implementation of Program Actions will be equipped with a muffler of a type recommended by the manufacturer. Equipment and trucks used for Project-related activities will utilize the best available noise control techniques (e.g., engine enclosures, acoustically attenuating shields or shrouds, intake silencers, ducts, etc.) whenever necessary. Finally, stationary noise sources and staging areas will be located as far from potential sensitive noise receptors, as possible. If they must be located near potential sensitive noise receptors, stationary noise sources will be muffled or shielded and/or enclosed within temporary sheds. Therefore, Standard Project Requirement NOISE-1 would reduce the severity of potential impacts from remediation activities, but it is uncertain at this time if all noise impacts could be reduced to a less than significant level.

Mitigation Measures: No additional mitigation measures have been identified at this time.

Level of Significance After Mitigation: Potentially Significant and Unavoidable

Impact 4.9-3: Program Actions Could Result in Substantial Temporary or Periodic Increase in Ambient Noise Levels in the Park Vicinity

As noted in Impact 4.9-1, implementation of several Program Actions would result in the creation of noise above existing ambient conditions within and outside of Park boundaries. The resulting Project Actions would involve the use of heavy earth-moving equipment (bulldozers, loaders, graders, scrapers, etc.) boring equipment, chainsaws, etc. Noise generated by such activities would depend on the types and number of pieces of equipment operating concurrently. Impacts on Park visitors would depend on the proximity of visitors to the Project Actions, the duration of exposure to such activities, and the noise generation of the Project Actions.

In addition, noise generated by off-site truck traffic would depend on the number of trucks, truck speed, truck load, roadway grade and roadway condition. Impacts associated with Project truck traffic noise would depend on proximity to sensitive receptor locations, the roadways utilized and time of day the truck traffic occurs, the proximity of the sensitive receptors to the roadways, the degree of natural or man-made shielding present between the roadways and the receptor, and the atmospheric conditions. Because residences located near roadways utilized by Project heavy truck traffic could experience noise level in excess of local noise limits, or result in substantial increases in ambient noise levels, this impact is considered potentially significant.

Assuming a potential maximum noise exposure level of 90 dB L_{eq} at a reference distance of 50 feet, and that Remediation Areas would be off-limits to potential noise sensitive receptors, the maximum noise level exposure would be approximately 70-80 dBA. This range of noise levels is similar to that experienced within the interior of an aircraft cabins and are below the levels considered hazardous to hearing.

Level of Significance Before Mitigation: Potentially Significant

Standard Project Requirement NOISE-1 would reduce the severity of potential impacts from Program Actions, but it is uncertain at this time if all noise impacts could be reduced to a less than significant level.

Mitigation Measures: No additional mitigation measures have been identified at this time.

Level of Significance After Mitigation: Potentially Significant and Unavoidable

4.9.5 EFFECTS CONSIDERED NO IMPACT OR LESS THAN SIGNIFICANT WITHOUT PROJECT REQUIREMENTS

The following describes environmental effects that were determined to be less than significant without Project Requirements or no impact; therefore, they are not discussed in detail in the Draft PEIR:

- Excessive Ground-Borne Vibration: The primary source of groundborne vibrations would be associated with equipment and haul truck movement with the Park while conducting remediation and Project actions. These types of equipment do not produce appreciable vibration levels given that the weight is stable during travel and does not result in vertical displacement sufficient to cause vibration generation.
- Excessive Public or Private Airport Noise: No new public or private airport or airstrip is proposed.

4.9.6 FINDINGS

Impacts to Noise associated with Project noise levels in excess of established standards (i.e. General Plan), permanent ambient noise level increases, and temporary ambient noise level increases are considered potentially significant and unavoidable.