4.11 NOISE

Would the project:	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. 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?		✓		
b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?		✓		
c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?			✓	
d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?		✓		
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				✓
f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				✓

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Sound is characterized by both its amplitude and frequency (or pitch). The human ear does not hear all frequencies equally. In particular, the ear deemphasizes low and very high frequencies. To better approximate the sensitivity of human hearing, the A-weighted decibel scale (dBA) has been developed. On this scale, the human range of hearing extends from approximately 3 dBA to around 140 dBA.

Noise is generally defined as unwanted or excessive sound, which can vary in intensity by over one million times within the range of human hearing; therefore, a logarithmic scale, known as the decibel scale (dB), is used to quantify sound intensity. Noise can be generated by a number of sources, including mobile sources such as automobiles, trucks, and airplanes, and stationary sources such as construction sites, machinery, and industrial operations. Noise generated by mobile sources typically attenuates (is reduced) at a rate between 3.0 dBA and 4.5 dBA per doubling of distance. The rate depends on the ground surface and the number or type of objects between the noise source and the receiver. Hard and flat surfaces, such as concrete or asphalt, have an attenuation rate of 3.0 dBA per doubling of distance. Soft surfaces, such as uneven or vegetated terrain, have an attenuation rate of about 4.5 dBA per doubling of distance. Noise generated by stationary sources typically attenuates at a rate between 6.0 dBA and about 7.5 dBA per doubling of distance.

There are a number of metrics used to characterize community noise exposure, which fluctuate constantly over time. One such metric, the equivalent sound level (L_{eq}), represents a constant sound that, over the specified period, has the same sound energy as the time-varying sound. Noise exposure over a longer period of time is often evaluated based on the Day-Night Sound Level (L_{dn}). This is a measure of 24-hour noise levels that incorporates a 10-dBA penalty for sounds occurring between 10 p.m. and 7 a.m. The penalty is intended to reflect the increased

human sensitivity to noises occurring during nighttime hours, particularly at times when people are sleeping and there are lower ambient noise conditions. Typical L_{dn} noise levels for light and medium density residential areas range from 55 dBA to 65 dBA.

Two of the primary factors that reduce levels of environmental sounds are increasing the distance between the sound source to the receiver and having intervening obstacles such as walls, buildings, or terrain features between the sound source and the receiver. Factors that act to increase the loudness of environmental sounds include moving the sound source closer to the receiver, sound enhancements caused by reflections, and focusing caused by various meteorological conditions.

U.S. Environmental Protection Agency

The U.S. Environmental Protection Agency (Environmental Protection Agency) offers guidelines for community noise exposure in the publication *Noise Effects Handbook*. The guidelines consider occupational noise exposure as well as noise exposure in homes. The Environmental Protection Agency recognizes an exterior noise level of 55 decibels day-night level dBA L_{dn} as a general goal to protect the public from hearing loss, activity interference, sleep disturbance, and annoyance. The Environmental Protection Agency and other Federal agencies have adopted suggested land use compatibility guidelines that indicate that residential noise exposures of 55 dBA L_{dn} to 65 dBA L_{dn} are acceptable.

State of California

The State Office of Planning and Research *Noise Element Guidelines* include recommended exterior and interior noise level standards for local jurisdictions to identify and prevent the creation of incompatible land uses due to noise. The *Noise Element Guidelines* contain a land use compatibility table that describes the compatibility of various land uses with a range of environmental noise levels in terms of the Community Noise Equivalent Level (CNEL). A noise environment of 50 CNEL to 60 CNEL is considered to be of "normally acceptable" for residential uses. The Office of Planning and Research recommendations also note that, under certain conditions, more restrictive standards than the maximum levels cited may be appropriate. As an example, the standards for quiet suburban and rural communities may be reduced by 5 dBA CNEL to 10 dBA CNEL to reflect their lower existing outdoor noise levels in comparison with urban environments.

Town of Mammoth Lakes

Title 8.0, *Health and Safety,* of the Town of Mammoth Lakes Municipal Code (Municipal Code) covers all noise standards. Chapter 8.16, *Noise Regulation*, of the Municipal Code sets forth all noise regulations controlling unnecessary, excessive, and annoying noise and vibration in the Town of Mammoth Lakes (Town). As outlined in Chapter 8.16 of the Municipal Code and as indicated in Table 4.11-1, *Exterior Noise Limits,* maximum exterior noise levels are based on land use districts. The following is taken from the Municipal Code*:*

> *Section 8.16.070 Exterior noise limits.*
>
> *A. The noise standards for the various categories of land use identified by the noise control officer as presented in Table 1* [refer to Table 4.11-1] *shall, unless*

otherwise specifically indicated, apply to all such property within a designated zone.

B. *No person shall operate or cause to be operated any source of sound at any location within the town or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person, which causes the noise level when measured on any other property to exceed:*

1. *The noise standard for that land use as in Table 1* [refer to Table 4.11-1] *for a cumulative period of more than thirty minutes in any hour; or*
2. *The noise standard plus five dB for a cumulative period of more than fifteen minutes in any hour; or*
3. *The noise standard plus ten dB for a cumulative period of more than five minutes in any hour; or*
4. *The noise standard plus fifteen dB for a cumulative period of more than one minute in any hour; or*
5. *The noise standard plus twenty dB or the maximum measured ambient level, for any period of time.*

C. *If the measured ambient level differs from that permissible within any of the first four noise limit categories above the allowable noise exposure standard shall be adjusted in five dB increments in each category as appropriate to encompass or reflect the ambient noise level.*

D. *In the event the ambient noise level exceeds the fifth noise limit category, the maximum allowable noise level under this category shall be increased to reflect the maximum ambient noise level.*

E. *If the measurement location is on a boundary between two different zones, the noise level applicable to the lower noise zone plus five dB, shall apply.*

F. *If possible, the ambient noise shall be measured at the same location along the property line utilized in subsection B of this section with the alleged offending noise source inoperative. If for any reason the alleged offending noise source cannot be shut down, the ambient noise must be estimated by performing a measurement in the same general area of the source but at a sufficient distance such that the noise from the source is at least ten dB below the ambient in order that only the ambient level is measured. If the difference between the ambient and the noise source is five to ten dB, then the level the ambient itself can be reasonably determined by subtracting a one decibel correction to account for the contribution of the source.*

G. *In the event the alleged offensive noise, as judged by the noise control officer, contains a steady, audible tone such as a whine, screech, or hum, or is a repetitive noise such as hammering or riveting, or contains music or speech conveying informational content, the standard limits set forth in Table 1* [refer to Table 4.11-1] *shall be reduced by five dB.*

Table 4.11-1
Exterior Noise Limits

Receiving Land Use Category	Time Period	Rural/Suburban	Suburban	Urban
One and Two Family Residential	10 p.m. – 7 a.m.	40	45	50
	7 a.m. – 10 p.m.	50	55	60
Multiple Dwelling Residential	10 p.m. – 7 a.m.	45	50	55
	7 a.m. – 10 p.m.	NA	NA	NA
Public Space	7 a.m. – 10 p.m.	50	55	60
Limited Commercial Some Multiple Dwellings	10 p.m. – 7 a.m.	55	NA	NA
	7 a.m. – 10 p.m.	60	NA	NA
Commercial	10 p.m. – 7 a.m.	60	NA	NA
	7 a.m. – 10 p.m.	65	NA	NA
Light Industrial	Anytime	70	NA	NA
Heavy Industrial	Anytime	75	NA	NA

Source: Town of Mammoth Lakes, *Municipal Code*, March 19, 2008.

Note: The classification of different areas of the community in terms of environmental noise zones shall be determined by the noise control officer, based upon assessment of community noise survey data. Additional area classifications should be used as appropriate to reflect both lower and higher existing ambient levels than those shown. Industrial noise limits are intended primarily for use at the boundary of industrial zones rather than for noise reduction within the zone

Additionally, the Municipal Code states the following regarding interior noise standards:

> *Section 8.16.080 Interior noise standards.*
>
> *B. No person shall operate, or cause to be operated within a dwelling unit, any source of sound or allow the creation of any noise which causes the noise level when measured inside a neighboring receiving dwelling unit to exceed:*
>
> *1. The noise standard for that land use district as specified in Table 2* [refer to Table 4.11-2, *Interior Noise Standards*] *for a cumulative period of more than five minutes in any hour; or*
>
> *2. The noise standard plus five dB for a cumulative period of more than one minute in any hour; or*
>
> *3. The noise standard plus ten dB or the maximum measured ambient, for any period of time.*
>
> *C. If the measured indoor ambient level differs from that permissible within any of the noise limit categories above, the allowable noise exposure standard shall be adjusted in five dB increments in each category as appropriate to reflect the indoor ambient noise level.*
>
> *D. In the event the alleged offensive noise, as judged by the noise control officer, contains a steady, audible tone such as a whine, screech, or hum, or is a repetitive noise such as hammering or riveting, or contains music or speech conveying informational content, the standard limits set forth in Table 2* [refer to Table 4.11-2] *shall be reduced by five dB. (Prior code §10.16.070)*

Table 4.11-2
Interior Noise Standards

Noise Zone	Type of Land Use	Time Interval	Allowable Interior Noise Level
All	Multifamily Residential	10 p.m. – 7 a.m.	35 dBA
		7 a.m. – 10 p.m.	45 dBA

Source: Town of Mammoth Lakes, *Municipal Code*, March 19, 2008.

In addition to interior and exterior noise standards, the Town provides regulations for construction activities and other types of noises in Section 8.16.090, *Prohibited Acts*. The following noise regulations were taken from Section 8.16.090 for regulations relevant to the proposed project:

5. *Loading, unloading, opening, closing or other handling of boxes, crates, containers, building materials, garbage cans, or similar objects between the hours of ten p.m. and seven a.m. in such a manner as to cause a noise disturbance across a residential real property line or at any time to violate the provisions of this section.*

6. *Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work is subject to the hours of work permitted by this code, except for emergency work of public service agencies.*

   a. *At residential properties:*

   i. *Mobile equipment: Maximum noise levels for nonscheduled, intermittent, short-term operation (less than ten days) of mobile equipment* [refer to Table 4.11-3, *Maximum Noise Levels for Short-Term Noise*].

   ii. *Stationary equipment: Maximum noise levels for repetitively scheduled and relatively long-term operation (periods of ten days or more) of stationary equipment* [refer to Table 4.11-4, *Maximum Noise Levels for Long-Term Noise*].

Table 4.11-3
Maximum Noise Levels for Short-Term Noise

Acceptable Hours Operation	Type I Areas Single-Family Residential	Type II Areas Multifamily Residential	Type III Areas 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 Sundays and legal holidays	60 dBA	65 dBA	70 dBA

Source: Town of Mammoth Lakes, *Municipal Code*, March 19, 2008.

Table 4.11-4
Maximum Noise Levels for Long-Term Noise

Acceptable Hours Operation	Type I Areas Single-Family Residential	Type II Areas Multifamily Residential	Type III Areas 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 Sundays and legal holidays	50 dBA	55 dBA	60 dBA

Source: Town of Mammoth Lakes, *Municipal Code*, March 19, 2008.

For construction noise, a "substantial" noise increase can be defined as interference with activities during the day. One indicator that construction noise could interfere with daytime activities would be speech interference. As the Town of Mammoth Lakes does not have quantitative guidelines for construction noise, the following criteria is utilized in the analysis to define relative construction related noise impacts:

- *Speech Interference Criteria*. A Speech Interference Level was designed as a simplified substitute for the Articulation Index.[1] The Speech Interference Level is considered to provide a better estimate of the masking ability of a noise. As Speech Interference Level does not take the actual speech level into account, the associated masking effect depends upon vocal effort and speaker-to-listener distance. Speech spoken with slightly more vocal effort can be understood well, when the noise level is 65 dBA. A typical building can reduce noise levels by 20 dBA with the windows closed.[2] This noise reduction could be maintained only on a temporary basis in some cases, since it assumes windows would remain closed at all times. Therefore, this analysis utilizes an interior level of 65 dBA as a criterion level for determining significance for construction related activities, in the absence of an adopted specific construction noise related threshold by the Town of Mammoth Lakes.

Existing Environment

The project site is surrounded to the north, east, and west by residential uses (workforce housing) and transient lodging facilities. Table 4.11-5, *Sensitive Receptors*, provides a listing showing the location of sensitive receptors within one mile to project site.

[1] Articulation index takes into account that some frequencies are more effective in masking speech than others. The frequency range from 250 to 7000 Hz is divided into 20 bands. The difference between file average speech peak level in each of these bands is calculated and the resulting numbers combined to give a single index.
[2] United States Department of Housing and Urban Development, *The Noise Guidebook*, undated, page 14.

Table 4.11-5
Sensitive Receptors

Type	Name	Distance From Project Site (miles)[1]	Direction from Project Site
Residential	Various Residential	0.04 to 0.78	Various
Hospital	Mammoth Hospital	0.94	East
Place of Worship	Light House Church	0.17	East
	Church of Jesus Christ of Latter-Day Saints: Mammoth Lakes Branch	0.76	Southeast
	Mammoth Lakes Lutheran Church	0.92	Southeast
	Jehovah's Witnesses	0.96	Southeast
	Grace Community Church-Mammoth	0.96	Southeast
School	Mammoth Elementary School	0.55	South
	Mammoth Montessori Children's	0.47	Southeast
1. Sensitive receptor populations utilized in this analysis are those within a one-mile radius of the project site.			
Source: http://maps.google.com			

Noise Measurements

In order to quantify existing ambient noise levels in the proposed project area, RBF Consulting conducted two ten-minute noise measurements on December 13, 2007. Measured noise levels ranged from 55.0 dBA to 63.5 dBA; refer to Table 4.11-6, *Noise Measurements*. Noise monitoring equipment used for the ambient noise survey consisted of a Brüel & Kjær Hand-held Analyzer Type 2250 equipped with a 4189 pre-polarized freefield microphone. The monitoring equipment complies with applicable requirements of the American National Standards Institute for Type I (precision) sound level meters. The complete results of the field measurements are included in Appendix D, *Noise Data*.

Table 4.11-6
Noise Measurements

Site	Location	Day	
		Leq	Time
1	Northeast portion of the project site.	63.5	11:59 a.m.
2	Southwest portion of the project site.	55.0	12:13 p.m.
Source: RBF Consulting, December 13, 2007; refer to Appendix D, Noise Data.			

a) 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?

Less Than Significant Impact with Mitigation Incorporated. It is difficult to specify noise levels that are generally acceptable to everyone; what is annoying to one person may be unnoticed by another. Standards may be based on documented complaints in response to documented noise levels, or based on studies of the ability of people to sleep, talk, or work under various noise conditions. All such studies

however, recognize that individual responses vary considerably. Standards usually address the needs of most of the general population.

As stated above, Title 8.0, *Health and Safety*, of the Town's Municipal Code covers all noise standards. Also, Municipal Code Chapter 8.16, *Noise Regulation*, sets forth all noise regulations controlling unnecessary, excessive, and annoying noise and vibration in the Town. As outlined in Municipal Code Chapter 8.16, maximum exterior noise levels are based on land use districts. In addition to interior and exterior noise standards, the Town provides regulations for construction activities and other types of noises in Municipal Code Section 8.16.090, *Prohibited Acts*.

Short-Term Noise Impacts

Construction activities would include demolition, grading, trenching, paving, building construction, and architectural coatings. Construction is scheduled to begin May 2009 and finish in July 2010. Demolition activities would include the removal of approximately 720 cubic yards of pavement and nine structures. Overall, a total of 45,000 cubic yards of soil would be excavated and exported. The proposed project would not require any import fill.

The noisiest phase of construction is expected to occur during site demolition, excavation, and grading. High groundborne noise levels and other miscellaneous noise levels can be created by the operation of heavy-duty trucks, backhoes, bulldozers, excavators, front-end loaders, compactors, scrapers, and other heavy-duty equipment. Construction activities would also cause increased noise along access routes to and from the site due to movement of equipment and workers. Table 4.11-7, *Typical Construction Equipment Noise Levels*, indicates the anticipated equipment noise levels of the construction equipment that would be utilized. The noise levels presented in Table 4.11-7 are based on the quantity, type, and Acoustical Use Factor for each type of equipment that would be used.

Table 4.11-7
Typical Construction Equipment Noise Levels

Type of Equipment	Acoustical Use Factor[1]	L_{max} at 50 Feet (dBA)
Compactor (ground)	20	80
Compressor (air)	40	78
Crane	16	81
Dump Truck	40	76
Excavator	40	81
Front End Loader	40	79
Paver	50	77
Water Truck	40	75
Vibrating Concrete Mixer	50	78

Note:
1 – Acoustical Use Factor (percent): Estimates the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during a construction operation.

Source: Federal Highway Administration, *Roadway Construction Noise Model (FHWA-HEP-05-054)*, January 2006; refer to Appendix D.

Table 4.11-8, *Construction Average Leq Noise Levels by Distance and Construction Stage*, provides a description of construction noise levels during specific construction phases. The demolition phase would include the removal of existing buildings and pavement. Construction equipment utilized during this phase would consist of dump trucks, excavators, loaders, and a water truck. The grading phase would include mostly site preparation activities with rough grading followed by fine grading. Construction equipment utilized during this phase would include dump trucks, excavators, loaders, and a water truck. During trenching activities, construction equipment includes excavators and loaders. Building, paving, and architectural coating activities would involve building construction and asphalt laydown activities, which would utilize compressors, dump trucks, pavers, cranes, concrete mixers, compactors, and loaders. The noise levels presented in Table 4.11-8 are based on the equipment noise profiles presented in Table 4.11-7 specific to each phase of development.

Short-term construction-related noise impacts would be anticipated during construction. Construction activities would expose adjacent receptors to interior noise levels of:

- 45.9 dBA to 50.7 dBA during Phase 1;
- 47.5 dBA to 52.2 dBA during Phase 2;
- 44.2 dBA to 49.0 dBA during Phase 3;
- 45.9 dBA to 50.7 dBA during Phase 4;
- 46.4 dBA to 51.2 dBA during Phase 5;
- 46.7 dBA to 51.5 dBA during Phase 6; and
- 40.6 dBA to 45.3 dBA during Phase 7.

The sensitive noise receptors located nearest the proposed development area are the Viewpoint Condominiums located approximately 268 feet to the north, The Chutes[3] (workforce housing) located approximately 185 feet to the east, and the White Stag Inn and Ullr Lodge located approximately 320 feet to the west.[4] As indicated in Table 4.11-8, the worst-case interior noise levels would be less than 65 dBA at these uses. According to Municipal Code Section 8.16.090, *Prohibited Acts*, short-term noise is considered noise that occurs for up to ten days, the highest acceptable noise levels would be 80 dBA at multi-family residential homes between the hours of 7:00 a.m. and 8:00 p.m.

These impacts are considered short-term and would cease upon completion of construction activities. Implementation of Mitigation Measure N-1 (i.e., muffling/placement of construction equipment and stockpiling/staging of construction

[3] The Chutes is approximately 30 feet from the project driveway and east wing however, the Chutes is a Mammoth Mountain Ski Area (MMSA) housing development and over the summer months, the workforce housing units are not occupied.

[4] Distance is measured from the nearest sensitive receptor to the center of the project site which approximates the acoustical dispersal characteristics of an active construction zone as not all pieces of construction equipment would operate simultaneously at the project boundary.

vehicles) and compliance with the Town's *Noise Ordinance* would serve to minimize the length of time residents are exposed to significant noise levels.

Table 4.11-8
Construction Average Leq Noise Levels by Distance and Construction Stage

Description	Receptor Locations		Estimated Exterior Construction Noise Level[3,4]	Estimated Interior Construction Noise Level[3,4]	Speech Interference Criteria	Exceed Criteria?
	Direction[1]	Distance[2]				
Phase 1						
Demolition	North	268 feet	67.5	47.5	65 dBA	*No*
	East	185 feet	70.7	50.7	65 dBA	*No*
	West	320 feet	65.9	45.9	65 dBA	*No*
Phase 2						
Mass Grading	North	268 feet	69.0	49.0	65 dBA	*No*
	East	185 feet	72.2	52.2	65 dBA	*No*
	West	320 feet	67.5	47.5	65 dBA	*No*
Phase 3						
Fine Grading	North	268 feet	65.8	45.8	65 dBA	*No*
	East	185 feet	69.0	49.0	65 dBA	*No*
	West	320 feet	64.2	44.2	65 dBA	*No*
Phase 4						
Trenching	North	268 feet	67.4	47.4	65 dBA	*No*
	East	185 feet	70.7	50.7	65 dBA	*No*
	West	320 feet	65.9	45.9	65 dBA	*No*
Phase 5						
Paving	North	268 feet	68.0	48.0	65 dBA	*No*
	East	185 feet	71.2	51.2	65 dBA	*No*
	West	320 feet	66.4	46.4	65 dBA	*No*
Phase 6						
Building Construction	North	268 feet	68.2	48.2	65 dBA	*No*
	East	185 feet	71.5	51.5	65 dBA	*No*
	West	320 feet	66.7	46.7	65 dBA	*No*
Phase 7						
Architectural Coating	North	268 feet	62.1	42.1	65 dBA	*No*
	East	185 feet	65.3	45.3	65 dBA	*No*
	West	320 feet	60.6	40.6	65 dBA	*No*

Notes:
1 – To the North are the Viewpoint Condominiums, to the East are The Chutes (workforce housing), and to the West are the White Stag Inn and Ullr Lodge. To the South is the Sierra Star Golf Course, which is not considered a sensitive receptor.
2 – Distance is from the nearest sensitive receptor to the center of the project site which approximates the acoustical dispersal characteristics of an active construction zone.
3 – Derived from the Federal Highway Administration, *Roadway Construction Noise Model (FHWA-HEP-05-054)*, January 2006; refer to Appendix D for equipment mixes used for each phase.
4 - A typical building can reduce noise levels by 20 dBA with the windows closed.[5] This assumes all windows and doors are closed, thereby attenuating the exterior noise levels by 20 dBA.

[5] United States Department of Housing and Urban Development, *The Noise Guidebook*, undated, page 14.

Fire Access Road Alternative

Similar to the proposed project, the Fire Access Road Alternative would result in a less than significant impact with mitigation incorporated pertaining to short-term construction impacts, as the proposed land uses and construction techniques/phasing would remain the same.

Mitigation Measures:

N-1 Prior to grading operations, the project shall demonstrate, to the satisfaction of the Town of Mammoth Lakes Community Development Department, that the project complies with the following through a construction management plan reviewed and approved by the Town:

- All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers;
- Construction noise reduction methods such as shutting off idling equipment, installing temporary acoustic barriers around stationary construction noise sources, maximizing the distance between construction equipment staging areas and occupied residential areas, and use of electric air compressors and similar power tools, rather than diesel equipment, shall be used where feasible;
- During construction, stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receivers;
- During construction, stockpiling and vehicle staging areas shall be located as far as practical from noise sensitive receptors;
- Operate earthmoving equipment on the construction site, as far away from vibration sensitive sites as possible; and
- A project sign shall be shall be clearly posted at the primary construction entrance, as an information resource for surrounding property owners and residents. The sign shall include the following minimum project information: project name, general contractor, normal construction hours, normal workdays, and local telephone number of the Job Superintendent. If the Town or the Job Superintendent receives a complaint, the Superintendent shall investigate, take appropriate corrective action, and report the action taken to the Town.

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Less Than Significant Impacts with Mitigation Incorporated. Due to the proximity of sensitive receptors from such construction activities, an analysis of the potential impacts associated with groundborne vibration and groundborne noise is required. Groundborne vibration is measured in terms of the velocity of the vibration oscillations. As with noise, a logarithmic decibel scale (VdB) is used to quantify

vibration intensity. When groundborne vibration exceeds 75 to 80 VdB, it is usually perceived as annoying to building occupants. The degree of annoyance is dependent upon type of land use, individual sensitivity to vibration, and the frequency of the vibration events. The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibration at moderate levels, to slight damage at the highest levels.

Ground-borne vibrations from construction activities rarely reach levels that damage structures. Typically, vibration levels must exceed 100 VdB before building damage occurs. Building damage can be cosmetic or structural. Ordinary buildings that are not particularly fragile would not experience any cosmetic damage (e.g., plaster cracks) at distances beyond 30 feet. This distance can vary substantially depending on the soil composition and underground geological layer between vibration source and receiver. In addition, not all buildings respond similarly to vibration generated by construction equipment.

The primary vibratory source during the construction of the project would be large bulldozers. Based on published data, activities during grading and excavation generate an approximate vibration level of 87 VdB at a distance of 25 feet.[6] The nearest sensitive receptor (i.e., The Chutes) is approximately 185 feet east from the center of the proposed project. Vibration levels would be below thresholds for building damage. Additionally, distance attenuation would reduce levels below 87 VdB. Blasting and pile driving are not anticipated as part of the construction activities related to the parking structure excavation. As a result, vibration with potential to damage adjacent buildings is not anticipated. Construction equipment would not result in vibration impacts, based on the distance to the nearest sensitive receptor.

It should be noted that any vibration impacts would be temporary in nature and would cease upon completion of the grading and excavation construction phases. Therefore, project implementation would not result in the exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

Fire Access Road Alternative

Similar to the proposed project, the Fire Access Road Alternative would result in a less than significant impact with mitigation incorporated pertaining to potential increases in groundborne vibration and groundborne noise levels, as the proposed land uses and construction techniques would remain the same. Although construction of the fire lane would be close to the Chutes, potential construction-related noise impacts would be similar to the proposed project; refer to Response 4.11(a), *Short-Term Noise Impacts*.

Mitigation Measures: Refer to Mitigation Measure N-1. No additional mitigation measures are required.

[6] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Guidelines*, May 2006.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Less Than Significant Impact.

Long-Term Mobile Noise Impacts

Future development generated by the proposed project would result in a minor increase of additional traffic on adjacent roadways (approximately 916 additional daily trips). According to the *Holiday Haus Traffic Information Memorandum* prepared by LSA Associates dated July 15, 2008, refer to Appendix E, *Traffic Information Memorandum*, the proposed project would result in an increase of 916 daily trips and 76 trips during the typical winter Saturday peak hour. Based on the *Sierra Star Master Plan Draft SEIR*, the existing (winter 2004) traffic noise level on Main Street from Minaret Road to Mountain Boulevard is 62.4 dBA at 100 feet from the centerline, with an associated ADT volume of 16,020 vehicles. The proposed project would result in an increase of 916 daily trips for a total of 16,936 ADT which would not result in a perceptible increase in noise levels as traffic volumes would have to double to result in a 3 dBA increase.[7] It should also be noted that the traffic volumes distributed to other nearby roadways (i.e., Minaret Road and Old Mammoth Road) would be even further reduced as the traffic moves further from the project site. Thus, an even less perceptible increase in roadway noise would result along these roadways. Therefore, a less than significant impact would occur in this regard.

Fire Access Road Alternative

Similar to the proposed project, the Fire Access Road Alternative would result in a less than significant impact pertaining to any permanent noise increase in the project vicinity, as the proposed land uses would remain the same and the density would be slightly reduced.

Mitigation Measures: No mitigation measures are required.

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Less Than Significant Impact With Mitigation Incorporated.

Construction-related activities and equipment used during construction of the project could result in a temporary or periodic increase in ambient noise levels above existing levels. Construction activities may result in less than significant short-term noise impacts on surrounding uses. Refer to Response 4.11(a).

Noise typically associated with the operation activities of Hotel Condominium uses would be mostly generated by mechanical equipment (air conditioners, trash compactors, etc.).

[7] California Department of Transportation, *A Technical Supplement to the Traffic Noise Analysis Protocol*, October 1998, page 14.

Although several noise sources would be introduced, such as parking lot noise, heating, ventilation, air conditioning (HVAC) units, and truck deliveries, many of these noise sources would operate for only very brief periods of time. Stationary mechanical noise and parking lot noise usually do not operate concurrently. Medium trucks would make deliveries; no large truck deliveries would be made. Noise from truck deliveries are not anticipated to create a substantial noise increase due to the infrequency of truck deliveries and truck size. The proposed project would require the use of HVAC units. However, these would be enclosed with a rooftop parapet further attenuating potential noise impacts. In addition, actual HVAC unit activity levels would vary from season to season and day to day, and noise level reference data for the rooftop air conditioners are only available for high activity levels more characteristic of conditions during daytime hours on a warm summer day. Noise generated from mechanical equipment would not exceed the Town's noise standard, nor impact the closest sensitive receptors within the project vicinity. As a result, impacts would be less than significant and no mitigation is required. Refer to Response 4.11 (c).

In addition, special events (i.e., weddings, etc.) could occur at the project site potentially could temporarily increase ambient noise levels in the project vicinity. However, any special event taking place at the project site would be required to comply with the Town's Municipal Code and Noise Regulations. Thus, potential impacts in this regard would be less than significant.

Fire Access Road Alternative

Similar to the proposed project, the Fire Access Road Alternative would result in a less than significant impact with mitigation incorporated pertaining to temporary or periodic increases in ambient noise as the proposed land uses would remain the same.

Mitigation Measures: Refer to Mitigation Measures N-1. No additional mitigation measures are required.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. The project site is not located within an airport land use plan or within two miles of a public airport or public-use airstrip. The Mammoth Yosemite Airport is located approximately 6.5 miles east of the project site. Areas exposed to aircraft noise of CNEL 65 and higher remain within the airfield boundary of the Airport, on either Airport property or vacant land controlled by the Airport through leases or use permits. Implementation of the proposed project would not expose people residing or working in the project area to excessive noise levels associated with the operation of a public airport or private airstrip.

Fire Access Road Alternative

Similar to the proposed project, the Fire Access Road Alternative would result in no impact as the project site is not located within an airport land use plan or within two miles of a public airport or public-use airstrip.

Mitigation Measures: No mitigation measures are required.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. Refer to Response 4.11(e).

Fire Access Road Alternative

Refer to Response 4.11(e).

Mitigation Measures: No mitigation measures are required.

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