Gilman Springs Mine

NOISE IMPACT ANALYSIS

COUNTY OF RIVERSIDE

PREPARED BY:

Bill Lawson, PE, INCE
blawson@urbanxroads.com
(949) 336-5979

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
ANSI	American National Standards Institute
Calveno	California Vehicle Noise
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dBA	A-weighted decibels
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
I-215	Interstate 215
INCE	Institute of Noise Control Engineering
ISEE	International Society of Explosives Engineers
L_{eq}	Equivalent continuous (average) sound level
L_{max}	Maximum level measured over the time interval
L_{min}	Minimum level measured over the time interval
mph	Miles per hour
MTPY	Million tons per year
OSMRE	Office of Surface Mining and Reclamation Enforcement
PPV	Peak Particle Velocity
Project	Gilman Springs Mine
REMEL	Reference Energy Mean Emission Level
RMS	Root-mean-square
SR-60	State Route 60
SR-79	State Route 79
TPD	Tons per day
TPY	Tons per year
USBM	United States Bureau of Mines
VdB	Vibration Decibels

EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the noise potential impacts and the necessary noise mitigation measures, if any, for the proposed Gilman Springs Mine development ("Project"). The Project site is located on the northeast side of Gilman Springs Road and south of Bridge Street in unincorporated County of Riverside. The Project is proposing a mining permit that would allow for 24-hour operations 7 days a week, including holidays and mining activity of up to 1,000,000 tons per year (TPY). Historical data indicates actual average mining activity of 377,675 TPY over the past 15-years.

This study has been prepared consistent with County of Riverside noise standards and significance criteria based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

OFF-SITE TRAFFIC NOISE ANALYSIS

Traffic generated by the operation of the Project will influence the traffic noise levels in surrounding off-site areas. To quantify the off-site traffic noise increases on the surrounding off-site areas, the changes in traffic noise levels on six roadway segments surrounding the Project site were calculated based on the change in the average daily traffic (ADT) volumes. The traffic noise levels provided in this analysis are based on the traffic forecasts found in *Gilman Springs Mine Traffic Impact Analysis* and the *Gilman Springs Mine Supplemental Traffic Assessment* prepared by Urban Crossroads, Inc. (2)

To assess the off-site noise level impacts associated with the proposed Project, noise contour boundaries were developed for Existing (2019), Existing plus Ambient Growth (EA) (2019), and EA plus Cumulative Development (EAC) (2019) conditions traffic conditions. The analysis shows that the unmitigated Project-related traffic noise level increases under all with Project traffic scenarios are considered *less than significant* impacts at land uses adjacent to the study area roadway segments.

OPERATIONAL NOISE ANALYSIS

Using reference noise levels to represent the expected noise sources within Gilman Springs Mine site, this analysis estimates the Project-related stationary-source noise levels at the nearby sensitive receiver locations. The typical activities associated with the proposed Gilman Springs Mine are anticipated to include crushing and screening activities, loader activities and backup alarms, haul truck loading and pass-by events in combination with heavy equipment and dozer activity.

The operational noise analysis shows that the Project-related stationary source noise levels at all receiver locations will satisfy the County of Riverside daytime and nighttime exterior noise level standards at the nearby receiver locations in the Project study area. Further, this analysis demonstrates that the Project-related noise level increases to the existing noise environment at all noise-sensitive receiver locations would be less than the Federal Interagency Committee on

Noise (FICON) guidance for noise level increases and are considered *less than significant* during daytime and nighttime hours. Therefore, the stationary source noise level impacts associated with the proposed Project activities, such as the crushing and screening activities, loader activities and backup alarms, haul truck loading and pass-by events in combination with heavy equipment and dozer activity will be *less than significant*.

BLASTING ANALYSIS

Blasting is a component of existing operations within the Project site. Existing blasting activities include, on average, between six to nine blasts per year, which vary in location, size, and purpose depending on production needs, benching, pit development, and drilling equipment available. Project blasting is expected to continue to be conducted on-site in a planned and intermittent basis at a maximum of 15 blasts per year. The blasting operations are required to be conducted at a time and manner so that disturbance or distraction would be minimized by and to any sensitive receivers that would or could be proximate to the blasting area. Further, the mining operator is required to obtain blasting permit(s) from the State, and to notify Riverside County Sheriff's Department within 24 hours of planned blasting events.

To assess the potential Project blasting impacts, the worst-case airblast and vibration levels were calculated based on a 1,500 pound maximum charge weight using the closest distance of 2,450 feet (including the 50-foot off-set for blasting) from receiver location R3 to a worst-case Project blasting location, consistent with the methodology provided in the International Society of Explosives Engineers (ISEE's) *Blasters' Handbook*. The worst-case airblast and vibration levels are shown to satisfy the Office of Surface Mining and Reclamation Enforcement (OSMRE) airblast and vibration level thresholds without accounting for any additional attenuation provided by intervening topography in the Project study area. Therefore, since airblast and vibration levels at the closest receiver location would remain below the airblast and vibration level thresholds based on reference ISEE data, Project-related blasting impacts are considered *less than significant.*

Further, the mining operator is required to design all blasts such that they remain below the significance thresholds identified by the USBM and OSMRE in addition to the permitting requirements of the State and Riverside County Sheriff's Department. Therefore, impacts related to Project blasting activities are considered *less than significant*.

SUMMARY OF CEQA SIGNIFICANCE FINDINGS

The results of this Gilman Springs Mine Noise Impact Analysis are summarized below based on the significance criteria in Section 4 of this report consistent with Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1). Table ES-1 shows the findings of significance for each potential noise and/or vibration impact under CEQA before and after any required mitigation measures described below.

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
Off-Site Traffic Noise Levels	7	*Less Than Significant*	*n/a*
Operational Noise Levels	9	*Less Than Significant*	*n/a*
Operational Vibration Levels		*Less Than Significant*	*n/a*
Blasting Airblast & Vibration Levels		*Less Than Significant*	*n/a*

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1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed Gilman Springs Mine ("Project"). The existing mine consists of excavated land located northeast of Gilman Springs Road. Existing operations include a primary crushing and crushed aggregate production location in the northern portion of the site, with crushing, washing, and sizing capable of making both crushed aggregates and washed aggregates. Secondary production activities take place in the eastern portion of the site which includes processing equipment for crushing, washing, and sizing of aggregate material.

This noise study briefly describes the proposed Project, provides information regarding noise fundamentals, describes the local regulatory setting, provides the study methods and procedures for traffic noise analysis, and evaluates the future exterior noise environment. In addition, this study includes an analysis of the potential Project-related long-term operational noise and short-term blasting airblast and vibration impacts.

1.1 SITE LOCATION

The proposed Gilman Springs Mine Project is located on the northeast side of Gilman Springs Road and south of Bridge Street in unincorporated County of Riverside, as shown on Exhibit 1-A. State Route 79 (SR-79) is located approximately 1.2 miles southeast of the Project site, State Route 60 (SR-60) is located approximately 4.0 miles north of the Project site, and Interstate 215 (I-215) is located approximately 11.7 miles west of the Project site. Existing agricultural uses are located west and south of the Project site; vacant land is located north of the Project site; and the Lamb Canyon Landfill is located roughly 1.5 miles east of the Project site.

1.2 PROJECT DESCRIPTION

The Project is proposing a mining permit that would allow for 24-hour operations 7 days a week, including holidays and continue to support mining activity of up to 1,000,000 tons per year (TPY). The Project's historic tonnage average is 377,675 tons per year (TPY) based on a 15-year average of historical data. For impact calculations that rely on annual tonnage, the net increase over the baseline (i.e., 377,675 TPY) will be evaluated as part of the analysis. When compared to the proposed permitted maximum annual production quantity of the 1.0 million tons per year (MTPY) results in a net increase of 622,235 TPY, or a 62.22-percent share of the total permitted annual production quantity. As such, the high-end estimate of daily tonnage at the site is approximately 4,000 tons per day (TPD), with approximately 1,511 TPD associated with the mine's existing operations (i.e., baseline) and 2,489 TPD attributable to the proposed Project (62.22-percent of 4,000 TPD). The Project is anticipated to be in operation by the end of 2019.

Exhibit 1-B shows the proposed Project mining operations and physical disturbance boundaries. The on-site Project-related noise sources are expected to include: crushing and screening activities, loader activities and backup alarms, haul truck loading and pass-by events in combination with heavy equipment and dozer activity. This noise analysis is intended to describe noise level impacts associated with the expected typical operational activities at the Project site.

Additional analysis is provided for short-term blasting events associated with Project mining operations.

1.3 PROJECT TRIP GENERATION

According to the *Gilman Springs Mine Traffic Impact Analysis* and the *Gilman Springs Mine Supplemental Traffic Assessment* prepared by Urban Crossroads, Inc. the Project is expected to generate a net total of approximately 350 trip-ends per day (actual vehicles). (2) The Project trip generation includes 320 truck trip-ends per day. This noise study relies on the actual Project trips (as opposed to the passenger car equivalents) to accurately account for the effect of individual truck trips on the study area roadway network.

EXHIBIT 1-A: LOCATION MAP

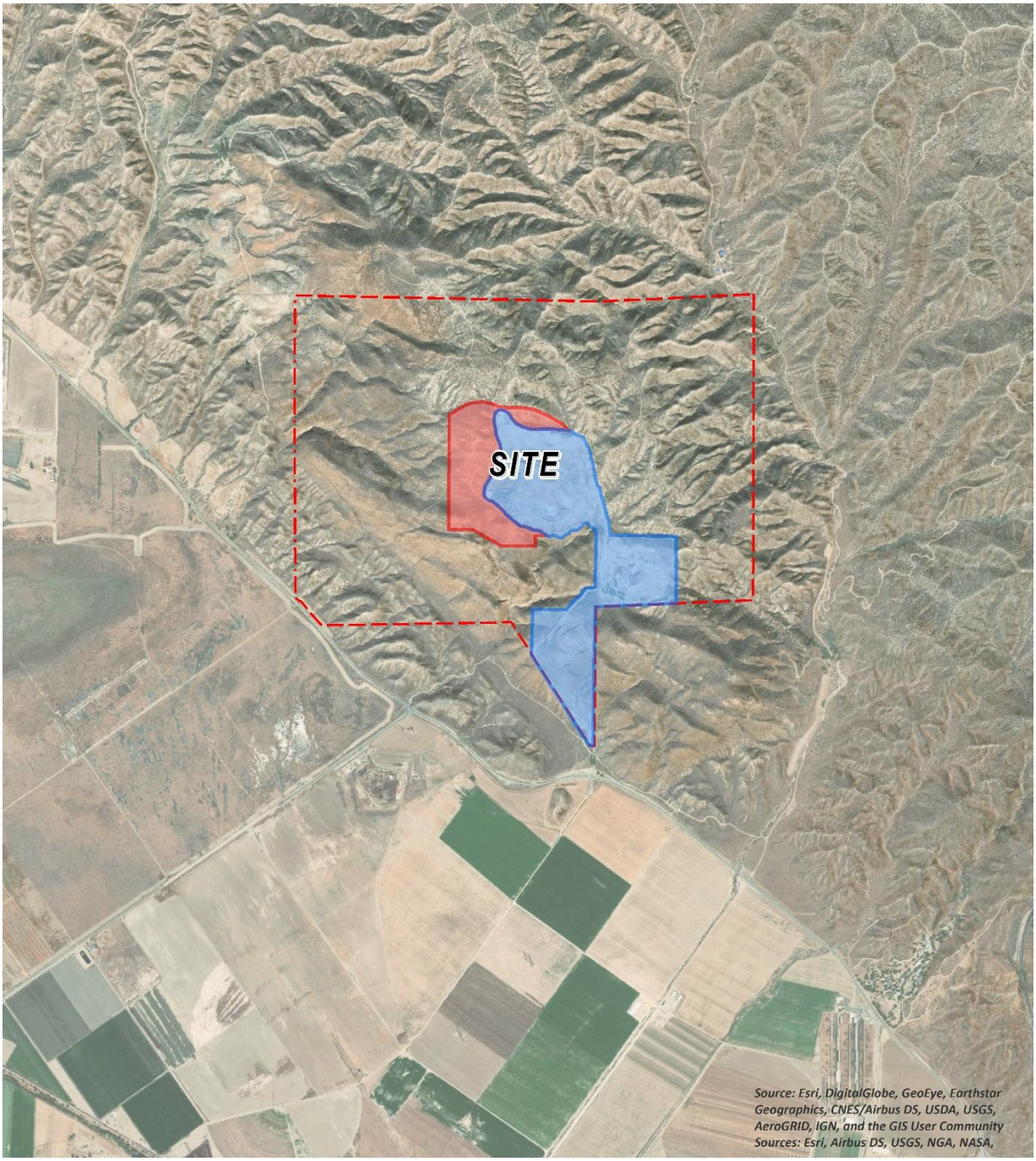
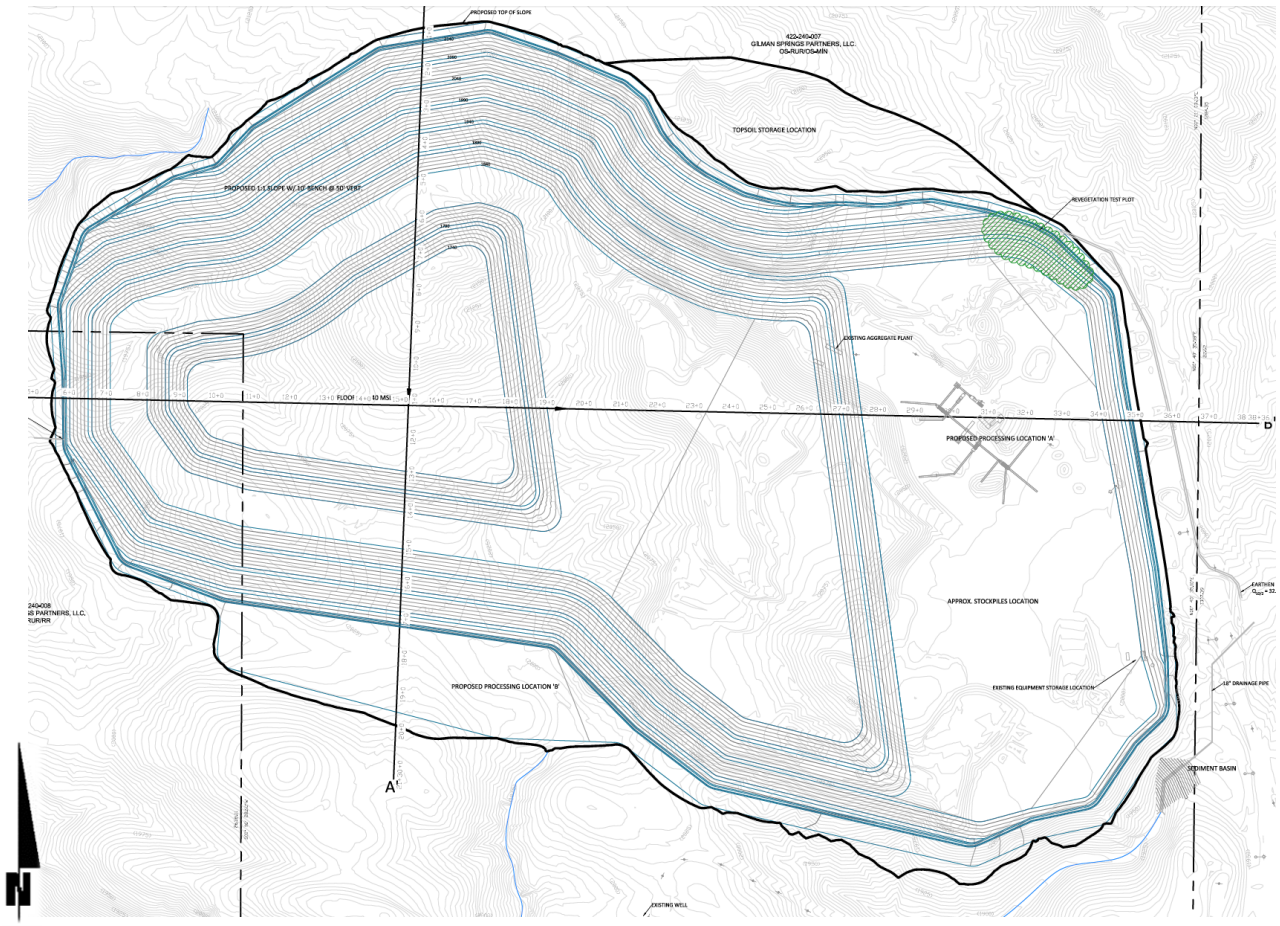


EXHIBIT 1-B: PROPOSED PHYSICAL DISTURBANCE PLAN



2 FUNDAMENTALS

Noise has been simply defined as "unwanted sound." Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). A-weighted decibels (dBA) approximate the subjective response of the human ear to broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear. Exhibit 2-A presents a summary of the typical noise levels and their subjective loudness and effects that are described in more detail below.

EXHIBIT 2-A: TYPICAL NOISE LEVELS

COMMON OUTDOOR ACTIVITIES	COMMON INDOOR ACTIVITIES	A - WEIGHTED SOUND LEVEL dBA	SUBJECTIVE LOUDNESS	EFFECTS OF NOISE
THRESHOLD OF PAIN		140	INTOLERABLE OR DEAFENING	HEARING LOSS
NEAR JET ENGINE		130		
		120		
JET FLY-OVER AT 300m (1000 ft)	ROCK BAND	110		
LOUD AUTO HORN		100	VERY NOISY	
GAS LAWN MOWER AT 1m (3 ft)		90		
DIESEL TRUCK AT 15m (50 ft), at 80 km/hr (50 mph)	FOOD BLENDER AT 1m (3 ft)	80		SPEECH INTERFERENCE
NOISY URBAN AREA, DAYTIME	VACUUM CLEANER AT 3m (10 ft)	70	LOUD	
HEAVY TRAFFIC AT 90m (300 ft)	NORMAL SPEECH AT 1m (3 ft)	60		
QUIET URBAN DAYTIME	LARGE BUSINESS OFFICE	50	MODERATE	SLEEP DISTURBANCE
QUIET URBAN NIGHTTIME	THEATER, LARGE CONFERENCE ROOM (BACKGROUND)	40		
QUIET SUBURBAN NIGHTTIME	LIBRARY	30	FAINT	NO EFFECT
QUIET RURAL NIGHTTIME	BEDROOM AT NIGHT, CONCERT HALL (BACKGROUND)	20		
	BROADCAST/RECORDING STUDIO	10	VERY FAINT	
LOWEST THRESHOLD OF HUMAN HEARING	LOWEST THRESHOLD OF HUMAN HEARING	0		

2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. (3) The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA at approximately 100 feet, which can cause serious discomfort. (4) Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

2.2 NOISE DESCRIPTORS

Environmental noise descriptors are generally based on averages, rather than instantaneous, noise levels. The most commonly used figure is the equivalent level (L_{eq}). Equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period and is commonly used to describe the "average" noise levels within the environment.

Peak hour or average noise levels, while useful, do not completely describe a given noise environment. Noise levels lower than peak hour may be disturbing if they occur during times when quiet is most desirable, namely evening and nighttime (sleeping) hours. To account for this, the Community Noise Equivalent Level (CNEL), representing a composite 24-hour noise level is utilized. The CNEL is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time of day corrections require the addition of 5 decibels to dBA L_{eq} sound levels in the evening from 7:00 p.m. to 10:00 p.m., and the addition of 10 decibels to dBA L_{eq} sound levels at night between 10:00 p.m. and 7:00 a.m. These additions are made to account for the noise sensitive time periods during the evening and night hours when sound appears louder. CNEL does not represent the actual sound level heard at any time, but rather represents the total sound exposure. The County of Riverside relies on the 24-hour CNEL level to assess land use compatibility with transportation related noise sources.

2.3 SOUND PROPAGATION

When sound propagates over a distance, it changes in level and frequency content. The way noise reduces with distance depends on the following factors.

2.3.1 GEOMETRIC SPREADING

Sound from a localized source (i.e., a stationary point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source. (3)

2.3.2 GROUND ABSORPTION

The propagation path of noise from a highway to a receiver is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 ft. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those

sites with an absorptive ground surface between the source and the receiver such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance from a line source. (5)

2.3.3 ATMOSPHERIC EFFECTS

Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects. (3)

2.3.4 SHIELDING

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 shielding depends on the size of the object and the frequency content of the noise source. Shielding by trees and other such vegetation typically only has an "out of sight, out of mind" effect. That is, the perception of noise impact tends to decrease when vegetation blocks the line-of-sight to nearby residents. However, for vegetation to provide a substantial, or even noticeable, noise reduction, the vegetation area must be at least 15 feet in height, 100 feet wide and dense enough to completely obstruct the line-of sight between the source and the receiver. This size of vegetation may provide up to 5 dBA of noise reduction. The FHWA does not consider the planting of vegetation to be a noise abatement measure. (5)

2.4 NOISE CONTROL

Noise control is the process of obtaining an acceptable noise environment for an observation point or receiver by controlling the noise source, transmission path, receiver, or all three. This concept is known as the source-path-receiver concept. In general, noise control measures can be applied to these three elements.

2.5 NOISE BARRIER ATTENUATION

Effective noise barriers can reduce noise levels by up to 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receiver. Noise barriers, however, do have limitations. For a noise barrier to work, it must be high enough and long enough to block the path of the noise source. (5)

2.6 LAND USE COMPATIBILITY WITH NOISE

Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than are commercial or industrial developments and related activities. As ambient noise levels affect the perceived amenity or

livability of a development, so too can the mismanagement of noise impacts impair the economic health and growth potential of a community by reducing the area's desirability as a place to live, shop and work. For this reason, land use compatibility with the noise environment is an important consideration in the planning and design process. The FHWA encourages State and Local government to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway, or that the developments are planned, designed, and constructed in such a way that noise impacts are minimized. (6)

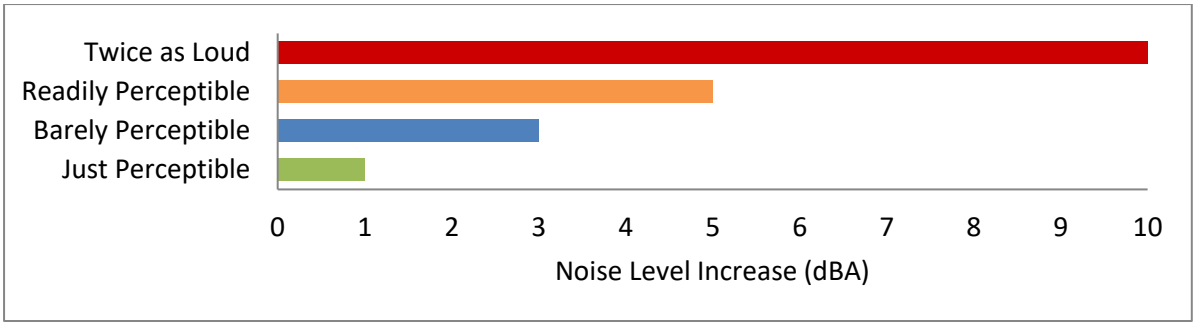
2.7 COMMUNITY RESPONSE TO NOISE

Community responses to noise may range from registering a complaint by telephone or letter, to initiating court action, depending upon everyone's susceptibility to noise and personal attitudes about noise. Several factors are related to the level of community annoyance including:

- Fear associated with noise producing activities;
- Socio-economic status and educational level;
- Perception that those affected are being unfairly treated;
- Attitudes regarding the usefulness of the noise-producing activity;
- Belief that the noise source can be controlled.

Approximately ten percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints will occur. Another twenty-five percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected from people exposed to any given noise environment. (7) Surveys have shown that about ten percent of the people exposed to traffic noise of 60 dBA will report being highly annoyed with the noise, and each increase of one dBA is associated with approximately two percent more people being highly annoyed. When traffic noise exceeds 60 dBA or aircraft noise exceeds 55 dBA, people may begin to complain. (7) Despite this variability in behavior on an individual level, the population can be expected to exhibit the following responses to changes in noise levels as shown on Exhibit 2-B. A change of 3 dBA are considered *barely perceptible*, and changes of 5 dBA are considered *readily perceptible*. (5)

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



2.8 EXPOSURE TO HIGH NOISE LEVELS

The Occupational Safety and Health Administration (OSHA) sets legal limits on noise exposure in the workplace. The permissible exposure limit (PEL) for a worker over an eight-hour day is 90 dBA. The OSHA standard uses a 5 dBA exchange rate. This means that when the noise level is increased by 5 dBA, the amount of time a person can be exposed to a certain noise level to receive the same dose is cut in half. The National Institute for Occupational Safety and Health (NIOSH) has recommended that all worker exposures to noise should be controlled below a level equivalent to 85 dBA for eight hours to minimize occupational noise induced hearing loss. NIOSH also recommends a 3 dBA exchange rate so that every increase by 3 dBA doubles the amount of the noise and halves the recommended amount of exposure time. (8)

OSHA has implemented requirements to protect all workers in general industry (e.g. the manufacturing and the service sectors) for employers to implement a Hearing Conservation Program where workers are exposed to a time weighted average noise level of 85 dBA or higher over an eight-hour work shift. Hearing Conservation Programs require employers to measure noise levels, provide free annual hearing exams and free hearing protection, provide training, and conduct evaluations of the adequacy of the hearing protectors in use unless changes to tools, equipment and schedules are made so that they are less noisy and worker exposure to noise is less than the 85 dBA. This noise study does not evaluate the noise exposure of workers within a project or construction site based on CEQA requirements, and instead, evaluates Project-related operational and construction noise levels at the nearby sensitive receiver locations in the Project study area.

2.9 VIBRATION

Per the Federal Transit Administration (FTA) *Transit Noise Impact and Vibration Assessment* (9), vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure-borne noise. Sources of ground-borne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. As is the case with airborne sound, ground-borne vibrations may be described by amplitude and frequency.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings but is not always suitable for evaluating human response (annoyance) because it takes some time for the human body to respond to vibration signals. Instead, the human body responds to average vibration amplitude often described as the root mean square (RMS). The RMS amplitude is defined as the average of the squared amplitude of the signal and is most frequently used to describe the effect of vibration on the human body. Decibel notation (VdB) is commonly used to measure RMS. Decibel notation (VdB) serves to reduce the range of numbers used to describe human response to vibration. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receivers for vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration-sensitive equipment and/or activities.

The background vibration-velocity level in residential areas is generally 50 VdB. Ground-borne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground-borne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Exhibit 2-C illustrates common vibration sources and the human and structural response to ground-borne vibration.

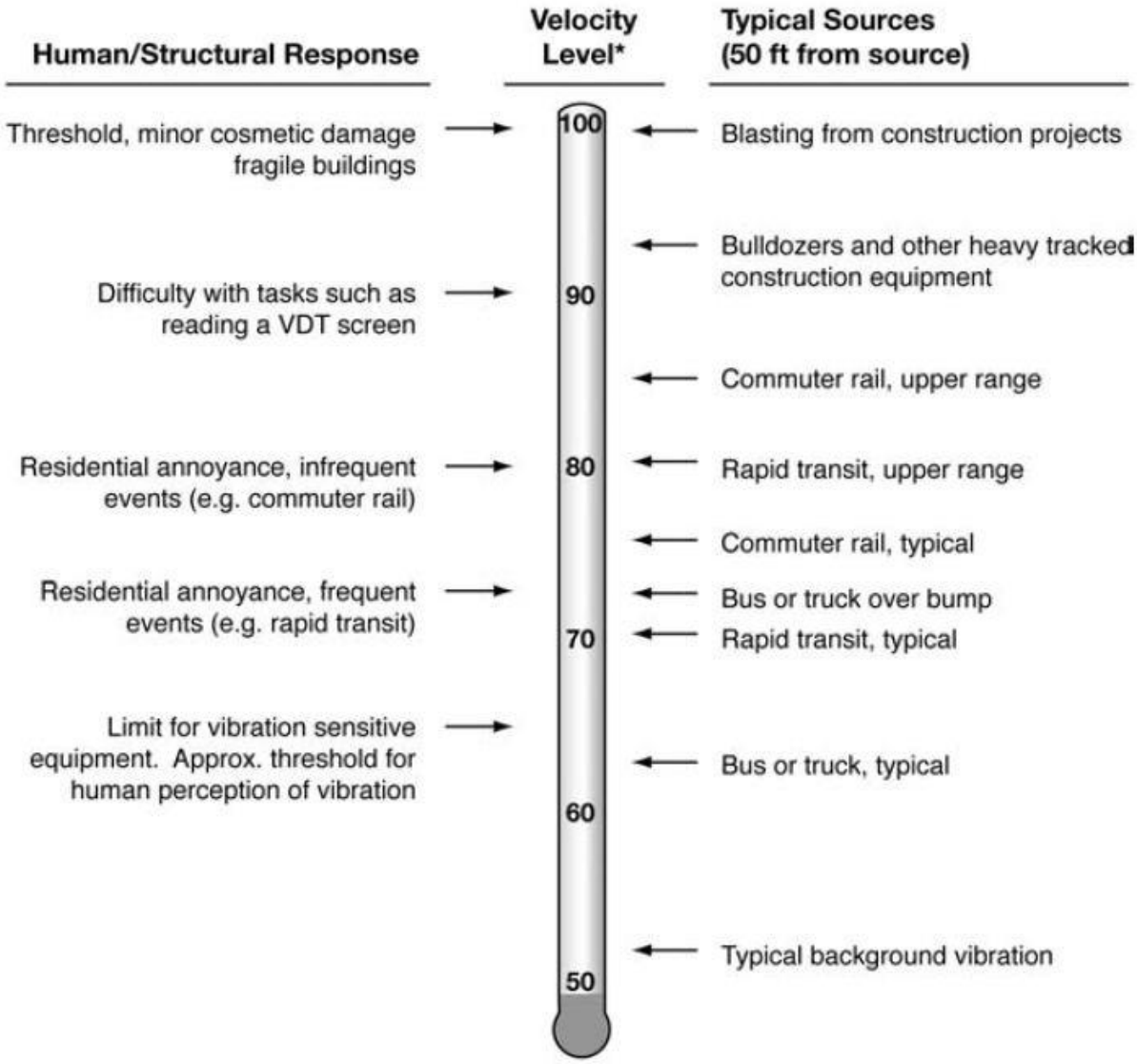
2.10 BLASTING FUNDAMENTALS

The intensity of the noise and vibration impacts associated with rock blasting depends on location, size, material, shape of the rock, and the methods used to crack it. While a blasting contractor can design the blasts to stay below a given vibration level that could cause damage to nearby structures, it is difficult to design blasts that produce noise levels which are not perceptible to receivers near the blast site. (10) The noise produced by blasting activities is referred to as air overpressure, or an “airblast,” which is generated when explosive energy in the form of gases escape from the detonating blast holes. Much like a point source, airblasts radiate outward in a spherical pattern and attenuate with each doubling of distance from the blast location, depending on the design of the blast and amount of containment.

Blasting activities generally include: the pre-drilling of holes in the hard rock area; preparation and placement of the charges in the drilled holes; a pre-blast horn signal; additional pre-blast horn signals immediately prior to the blast; and the blast itself. An additional horn signal is sounded to indicate the “all clear” after the blast and the blasting contractor has inspected the blasting area. The noise from the blast itself starts with a cracking sound from the detonator, located at a distance from the charges, and ends with the low crackling sound from each charge as they are subsequently set off. Blasts typically occur for only a few seconds, depending on their design. It is important to note that no other equipment will be operating during each blast in the blast area but will commence operation once the blasting contractor indicates it is safe to do so.

The blasting information provided herein is based on the 18th Edition of the International Society of Explosives Engineers' (ISEE's) *Blasters' Handbook*. (11)

EXHIBIT 2-C: TYPICAL LEVELS OF GROUND-BORNE VIBRATION



* *RMS Vibration Velocity Level in VdB relative to 10^{-6} inches/second*

Source: Federal Transit Administration (FTA) Transit Noise Impact and Vibration Assessment.

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3 REGULATORY SETTING

To limit population exposure to physically and/or psychologically damaging as well as intrusive noise levels, the federal government, the State of California, various county governments, and most municipalities in the state have established standards and ordinances to control noise. In most areas, automobile and truck traffic is the major source of environmental noise. Traffic activity generally produces an average sound level that remains constant with time. Air and rail traffic, and commercial and industrial activities are also major sources of noise in some areas. Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies.

3.1 STATE OF CALIFORNIA NOISE REQUIREMENTS

The State of California regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise standards, and provides guidance for local land use compatibility. State law requires that each county and city adopt a General Plan that includes a Noise Element which is to be prepared per guidelines adopted by the Governor's Office of Planning and Research (OPR). (12) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*. In addition, the California Environmental Quality Act (CEQA) requires that all known environmental effects of a project be analyzed, including environmental noise impacts.

3.2 COUNTY OF RIVERSIDE GENERAL PLAN NOISE ELEMENT

The County of Riverside has adopted a Noise Element of the General Plan to control and abate environmental noise, and to protect the citizens of County of Riverside from excessive exposure to noise. (13) The Noise Element specifies the maximum allowable exterior noise levels for new developments impacted by transportation noise sources such as arterial roads, freeways, airports and railroads. In addition, the Noise Element identifies several polices to minimize the impacts of excessive noise levels throughout the community and establishes noise level requirements for all land uses. To protect County of Riverside residents from excessive noise, the Noise Element contains the following policies related to the Project:

N 1.1 Protect noise-sensitive land uses from high levels of noise by restricting noise-producing land uses from these areas. If the noise-producing land use cannot be relocated, then noise buffers such as setbacks, landscaping, or block walls shall be used.

N 1.3 Consider the following uses noise-sensitive and discourage these uses in areas in excess of 65 CNEL:

- *Schools*
- *Hospitals*
- *Rest Homes*
- *Long Term Care Facilities*
- *Mental Care Facilities*
- *Residential Uses*

- *Libraries*
- *Passive Recreation Uses*
- *Places of Worship*

N 1.5 Prevent and mitigate the adverse impacts of excessive noise exposure on the residents, employees, visitors, and noise-sensitive uses of Riverside County.

N 4.1 Prohibit facility-related noise, received by any sensitive use, from exceeding the following worst-case noise levels:

a. 45 dBA 10-minute L_{eq} between 10:00 p.m. and 7:00 a.m.;

b. 65 dBA 10-minute L_{eq} between 7:00 a.m. and 10:00 p.m.

N 13.1 Minimize the impacts of construction noise on adjacent uses within acceptable standards.

N 13.2 Ensure that construction activities are regulated to establish hours of operation in order to prevent and/or mitigate the generation of excessive or adverse impacts on surrounding areas.

N 13.3 Condition subdivision approval adjacent to developed/occupied noise-sensitive land uses (see policy N 1.3) by requiring the developer to submit a construction-related noise mitigation plan to the [County] for review and approval prior to issuance of a grading permit. The plan must depict the location of construction equipment and how the noise from this equipment will be mitigated during construction of this project, through the use of such methods as:

i. Temporary noise attenuation fences;

ii. Preferential location and equipment; and

iii. Use of current noise suppression technology and equipment.

N 16.3 Prohibit exposure of residential dwellings to perceptible ground vibration from passing trains as perceived at the ground or second floor. Perceptible motion shall be presumed to be a motion velocity of 0.01 inches/second over a range of 1 to 100 Hz.

To ensure noise-sensitive land uses are protected from high levels of noise (N 1.1), Table N-1 of the Noise Element identifies guidelines to evaluate proposed developments based on exterior and interior noise level limits for land uses and requires a noise analysis to determine needed mitigation measures if necessary. The Noise Element identifies residential use as a noise-sensitive land use (N 1.3) and discourages new development in areas with 65 CNEL or greater existing ambient noise levels. To prevent and mitigate noise impacts for its residents (N 1.5), County of Riverside requires noise attenuation measures for sensitive land use exposed to noise levels higher than 65 CNEL.

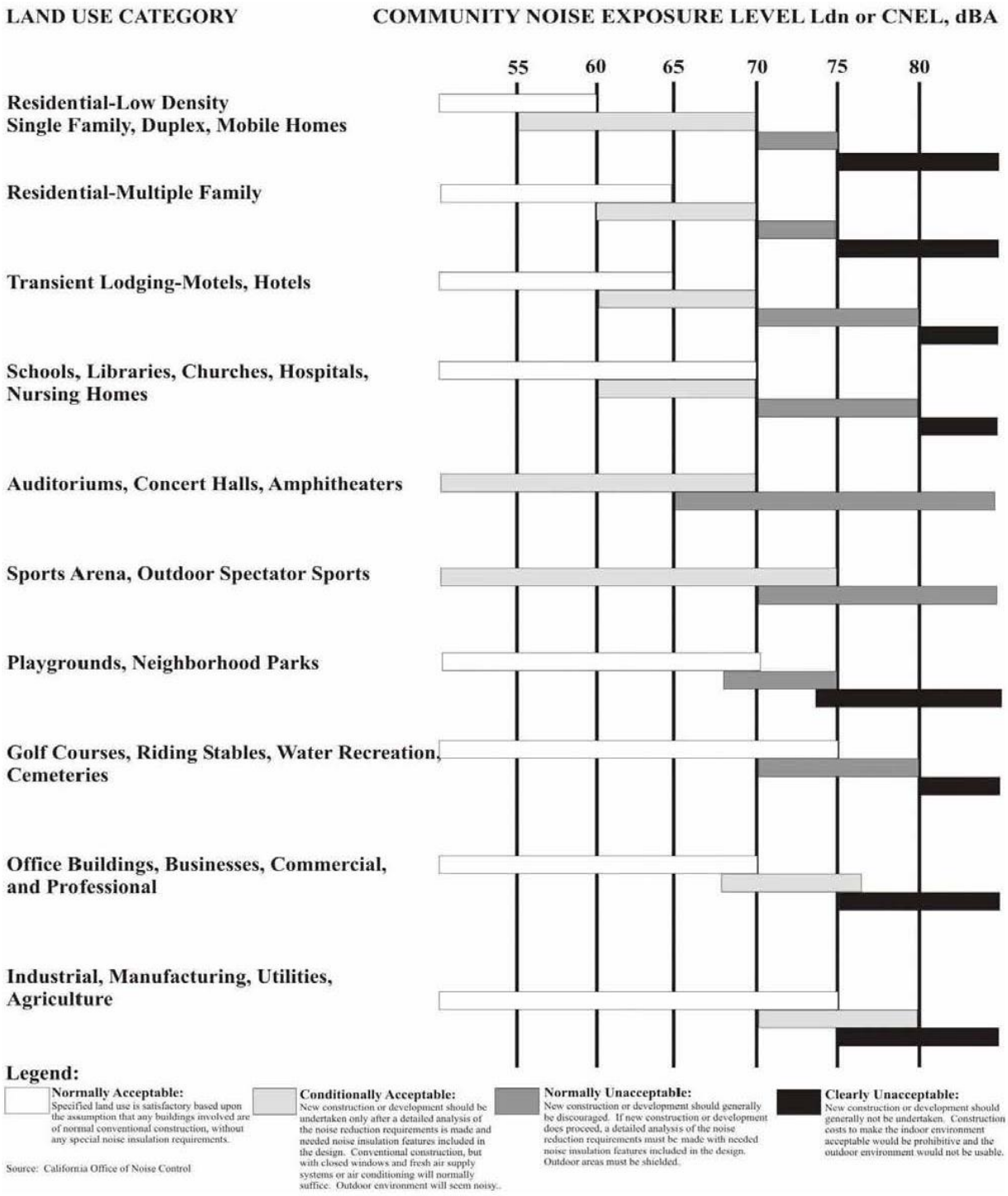
Policy N 4.1 of the Noise Element sets a stationary-source exterior noise limit not to be exceeded for a cumulative period of more than ten minutes in any hour of 65 dBA L_{eq} for daytime hours of 7:00 a.m. to 10:00 p.m., and 45 dBA L_{eq} during the noise-sensitive nighttime hours of 10:00 p.m. to 7:00 a.m. (13) To prevent high levels of construction noise from impacting noise-sensitive land uses, policies N 13.1 through 13.3 identify construction noise mitigation requirements for new development located near existing noise-sensitive land uses. Policy 16.3 establishes the vibration perception threshold for rail-related vibration levels, used in this analysis as a threshold for determining potential vibration impacts due to Project construction. (13)

3.3.1 LAND USE COMPATIBILITY

The noise criteria identified in the County of Riverside Noise Element (Table N-1) are guidelines to evaluate the land use compatibility of transportation related noise. The compatibility criteria, shown on Exhibit 3-A, provides the County with a planning tool to gauge the compatibility of land uses relative to existing and future exterior noise levels.

The *Land Use Compatibility for Community Noise Exposure* matrix describes categories of compatibility and not specific noise standards. The mining use of the Project is considered *normally acceptable* with unmitigated exterior noise levels of less than 70 dBA CNEL based on the *Industrial, Manufacturing, Utilities, Agriculture* land use compatibility criteria shown on Exhibit 3-A. Residential designated land uses in the Project study area are considered *normally acceptable* with exterior noise levels below 60 dBA CNEL, and *conditionally acceptable* with exterior noise levels of up to 70 dBA CNEL. For *conditionally acceptable* exterior noise levels approaching 75 dBA CNEL for Project land uses, *new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and the 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*. (13)

EXHIBIT 3-A: LAND USE COMPATIBILITY FOR COMMUNITY NOISE EXPOSURE



Source: County of Riverside General Plan Noise Element, Table N-1.

3.3 OPERATIONAL NOISE STANDARDS

The County of Riverside has set exterior noise limits to control community noise impacts from non-transportation noise sources (such as playgrounds, trash compactors, air-conditioning units, etc.). Policy N 4.1 of the Noise Element sets an exterior noise limit not to be exceeded for a cumulative period of more than ten minutes in any hour of 65 dBA L_{eq} for daytime hours of 7:00 a.m. to 10:00 p.m., and 45 dBA L_{eq} during the noise-sensitive nighttime hours of 10:00 p.m. to 7:00 a.m. (13) These stationary-source noise level standards, shown on Table 3-1, are consistent with the County of Riverside Office of Industrial Hygiene guidelines for noise studies within the County. (14)

TABLE 3-1: OPERATIONAL NOISE STANDARDS

Jurisdiction	Land Use	Time Period	Noise Level Standard (dBA L_{eq})[2]
County of Riverside[1]	Residential[1]	Daytime (7:00 a.m. - 10:00 p.m.)	65
		Nighttime (10:00 p.m. - 7:00 a.m.)	45

[1] Source: County of Riverside General Plan Noise Element, Table N-2.
[2] L_{eq} represents a steady state sound level containing the same total energy as a time varying signal over a given sample period.

3.4 VIBRATION STANDARDS

The County of Riverside does not have vibration standards for temporary construction, but the County's General Plan Noise Element does contain the human reaction to typical vibration levels. Vibration levels with peak particle velocity of 0.0787 inches per second are considered readily perceptible and above 0.1968 in/sec are considered annoying to people in buildings. Further, County of Riverside General Plan Policy N 16.3 identifies a motion velocity perception threshold for vibration due to passing trains of 0.01 inches per second (in/sec) over the range of one to 100 Hz, which is used in this noise study to assess potential impacts due to Project operational vibration levels. (13)

3.5 BLASTING REGULATIONS

The mining operator is required to obtain blasting permit(s) from the State, and to notify Riverside County Sheriff's Department within 24 hours of planned blasting events. Further, blasting operations are required to satisfy the maximum airblast and vibration levels identified by the U.S. Bureau of Mines (USBM) and Office of Surface Mining and Reclamation Enforcement (OSMRE).

3.5.1 AIRBLAST LIMITS

The OSMRE *Blasting Performance Standards* (Chapter 30 of the Code of Federal Regulations) identifies the maximum air overpressure and vibration levels at the *location of any dwelling, public building, school, church, or community or institutional building.* (15) Section 816.64

indicates that blasting shall be restricted to between sunrise and sunset per OSMRE standards, *unless nighttime blasting is approved by the regulatory authority based upon a showing by the operator that the public will be protected from adverse noise and other impacts*. Section 816.67 identifies maximum airblast limits, in linear dB (L), based on different frequency levels. For this noise study, the lowest limit of 129 dB (L) is used as a conservative threshold for analyzing blasting airblasts related to Project mining operations.

3.5.2 VIBRATION LIMITS

Vibration level limits are also identified in the OSMRE *Blasting Performance Standards*. Section 816.67(d)(2) identifies maximum vibration levels allowed at distance ranges from the blasting site. From zero to 300 feet, the maximum vibration level shall not exceed 1.25 inches per second (in/sec) PPV. Between 301 to 5,000 feet, maximum vibration levels shall not exceed 1.0 in/sec PPV, and at distances greater than 5,001 feet, the OSMRE maximum vibration level standard is 0.75 in/sec PPV. (15)

While additional blasting regulations can be imposed by the permitting agency, the OSMRE blasting regulations represent conservative thresholds for the purposes of this noise study to determine potential impacts related to blasting at nearby sensitive uses, based on the lowest OSMRE airblast limit of 129 dB (L), and 0.75 in/sec PPV for vibration, to present a conservative approach.

4 SIGNIFICANCE CRITERIA

The following significance criteria are based on currently adopted guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1) For the purposes of this report, impacts would be potentially significant if the Project results in or causes:

A. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

B. Generation of excessive ground-borne vibration or ground-borne noise levels?

C. For a project located within the vicinity of a private airstrip or 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?

While the County of Riverside General Plan Guidelines provide direction on noise compatibility and establish noise standards by land use type that are sufficient to assess the significance of noise impacts, they do not define the levels at which increases are considered substantial for use under Guideline A. CEQA Appendix G Guideline C applies to nearby public and private airports, if any, and the Project's land use compatibility.

CEQA GUIDELINES NOT FURTHER ANALYZED

The Project site is not located within two miles of a public airport or within an airport land use plan. The closest potential private airstrip is the Gilman Springs Flyers airstrip located roughly 1.5 miles west of the Project site, south of Gilman Springs Road. However, this airstrip is limited to remote controlled model airplanes and does not represent a major aircraft-related noise source capable of exposing people within the Project site to excessive noise levels. As such, the Project site would not be exposed to excessive noise levels from airport operations, and therefore, impacts are considered *less than significant,* and no further noise analysis is conducted in relation to Guideline C.

4.1 NOISE-SENSITIVE RECEIVERS

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines described above at the closest sensitive receiver locations. Under CEQA, consideration must be given to the magnitude of the increase, the existing ambient noise levels, and the location of noise-sensitive receivers to determine if a noise increase represents a significant adverse environmental impact. This approach recognizes *that there is no single noise increase that renders the noise impact significant.* (16)

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding human reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to

a new noise is the comparison of it to the existing environment to which one has adapted—the so-called *ambient* environment.

In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will typically be judged. The Federal Interagency Committee on Noise (FICON) (17) developed guidance to be used for the assessment of project-generated increases in noise levels that consider the ambient noise level. The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (CNEL) and equivalent continuous noise level (L_{eq}).

As previously stated, the approach used in this noise study recognizes *that there is no single noise increase that renders the noise impact significant*, based on a 2008 California Court of Appeal ruling on Gray v. County of Madera. (16) For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, FICON identifies a *readily perceptible* 5 dBA or greater project-related noise level increase is considered a significant impact when the noise criteria for a given land use is exceeded. Per the FICON, in areas where the without project noise levels range from 60 to 65 dBA, a 3 dBA *barely perceptible* noise level increase appears to be appropriate for most people. When the without project noise levels already exceed 65 dBA, any increase in community noise louder than 1.5 dBA or greater is considered a significant impact if the noise criteria for a given land use is exceeded, since it likely contributes to an existing noise exposure exceedance. Table 4-1 below provides a summary of the potential noise impact significance criteria, based on guidance from FICON.

TABLE 4-1: SIGNIFICANCE OF NOISE IMPACTS AT NOISE-SENSITIVE RECEIVERS

Without Project Noise Level	Potential Significant Impact
< 60 dBA	5 dBA or more
60 - 65 dBA	3 dBA or more
> 65 dBA	1.5 dBA or more

Federal Interagency Committee on Noise (FICON), 1992.

4.2 NON-NOISE-SENSITIVE RECEIVERS

The County of Riverside General Plan Noise Element, Table N-1, *Land Use Compatibility for Community Noise Exposure* was used to establish the satisfactory noise levels of significance for non-noise-sensitive land uses in the Project study area. As previously shown on Exhibit 3-A, the *normally acceptable* exterior noise levels for non-noise-sensitive land uses is 70 dBA CNEL. Noise levels greater than 70 dBA CNEL are considered *conditionally acceptable* per the *Land Use Compatibility for Community Noise Exposure*. (13)

To determine if Project-related traffic noise level increases are significant at off-site non-noise-sensitive land uses, a *readily perceptible* 5 dBA and *barely perceptible* 3 dBA criteria were used. When the without Project noise levels at the non-noise-sensitive land uses are below the *normally acceptable* 70 dBA CNEL compatibility criteria, a *readily perceptible* 5 dBA or greater noise level increase is considered a significant impact. When the without Project noise levels are greater than the *normally acceptable* 70 dBA CNEL land use compatibility criteria, a *barely perceptible* 3 dBA or greater noise level increase is considered a significant impact since the noise level criteria is already exceeded. The noise level increases used to determine significant impacts for non-noise-sensitive land uses is generally consistent with the FICON noise level increase thresholds s for noise-sensitive land uses but instead rely on the County of Riverside General Plan Noise Element, Table N-1, *Land Use Compatibility for Community Noise Exposure normally acceptable* 70 dBA CNEL exterior noise level criteria.

4.3 SIGNIFICANCE CRITERIA SUMMARY

Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development. Table 4-2 shows the significance criteria summary matrix.

OFF-SITE TRAFFIC NOISE

- When the noise levels at existing and future noise-sensitive land uses (e.g. residential, etc.):
    - are less than 60 dBA CNEL and the Project creates a *readily perceptible* 5 dBA CNEL or greater Project-related noise level increase; or
    - range from 60 to 65 dBA CNEL and the Project creates a *barely perceptible* 3 dBA CNEL or greater Project-related noise level increase; or
    - already exceed 65 dBA CNEL, and the Project creates a community noise level increase of greater than 1.5 dBA CNEL (FICON, 1992).
- When the noise levels at existing and future non-noise-sensitive land uses (e.g. office, commercial, industrial):
    - are less than the County of Riverside General Plan Noise Element, Table N-1, *normally acceptable* 70 dBA CNEL and the Project creates a *readily perceptible* 5 dBA CNEL or greater Project related noise level increase; or
    - are greater than the County of Riverside General Plan Noise Element, Table N-1, *normally acceptable* 70 dBA CNEL and the Project creates a *barely perceptible* 3 dBA CNEL or greater Project noise level increase.

OPERATIONAL NOISE & VIBRATION

- If Project-related operational (stationary source) noise levels exceed the exterior 65 dBA L_{eq} daytime or 45 dBA L_{eq} nighttime noise level standards at nearby sensitive receiver locations in the County of Riverside (County of Riverside General Plan Noise Element, Table N-2).
- If the existing ambient noise levels at the nearby noise-sensitive receivers near the Project site:
    - are less than 60 dBA L_{eq} and the Project creates a *readily perceptible* 5 dBA L_{eq} or greater Project-related noise level increase; or
    - range from 60 to 65 dBA L_{eq} and the Project creates a *barely perceptible* 3 dBA L_{eq} or greater Project-related noise level increase; or
    - already exceed 65 dBA L_{eq}, and the Project creates a community noise level increase of greater than 1.5 dBA L_{eq} (FICON, 1992).
- If Project generated operational vibration levels exceed the County of Riverside acceptable vibration standard of 0.01 in/sec RMS at sensitive receiver locations (County of Riverside General Plan, Policy N 16.3).

BLASTING AIRBLASTS AND VIBRATION

- If blasting within the Project site boundaries results in:
    - airblasts exceeding OSMRE standards of 129 dB (L); or
    - vibration levels exceeding OSMRE standards of 0.75 in/sec PPV (OSMRE Blasting Performance Standards).

TABLE 4-2: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Receiving Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Off-Site Traffic	Noise-Sensitive[1]	If ambient is < 60 dBA CNEL	≥ 5 dBA CNEL Project increase	
		If ambient is 60 - 65 dBA CNEL	≥ 3 dBA CNEL Project increase	
		If ambient is > 65 dBA CNEL	≥ 1.5 dBA CNEL Project increase	
	Non-Noise-Sensitive[1,2]	if ambient is < 70 dBA CNEL	≥ 5 dBA CNEL Project increase	
		if ambient is > 70 dBA CNEL	≥ 3 dBA CNEL Project increase	
Operational	Noise-Sensitive	Exterior Noise Level Standards[3]	65 dBA L_{eq}	45 dBA L_{eq}
		if ambient is < 60 dBA L_{eq}[1]	≥ 5 dBA L_{eq} Project increase	
		if ambient is 60 - 65 dBA L_{eq}[1]	≥ 3 dBA L_{eq} Project increase	
		if ambient is > 65 dBA L_{eq}[1]	≥ 1.5 dBA L_{eq} Project increase	
		Vibration Level Threshold[3]	0.01 in/sec PPV	
Blasting[4]	Noise-Sensitive	Airblast Threshold	129 dB (L)	n/a
		Vibration Level Threshold	0.75 in/sec PPV	n/a

[1] Source: FICON, 1992.
[2] Source: County of Riverside General Plan Noise Element, Table N-1.
[3] Source: County of Riverside General Plan Noise Element, Table N-2 (stationary noise sources) and Policy N 16.3 (vibration).
[4] Sources: OSMRE Blasting Performance Standards (Chapter 30 of the Code of Federal Regulations) and the ISEE's Blasters' Handbook.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.; "n/a" = nighttime blasting activities must be permitted by the regulatory authority; "PPV" = peak particle velocity.

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5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, 24-hour noise level measurements were taken at six sensitive receiver locations in the Project study area. The receiver locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 5-A provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Wednesday, December 12th, 2017. Appendix 5.1 includes study area photos.

5.1 MEASUREMENT PROCEDURE AND CRITERIA

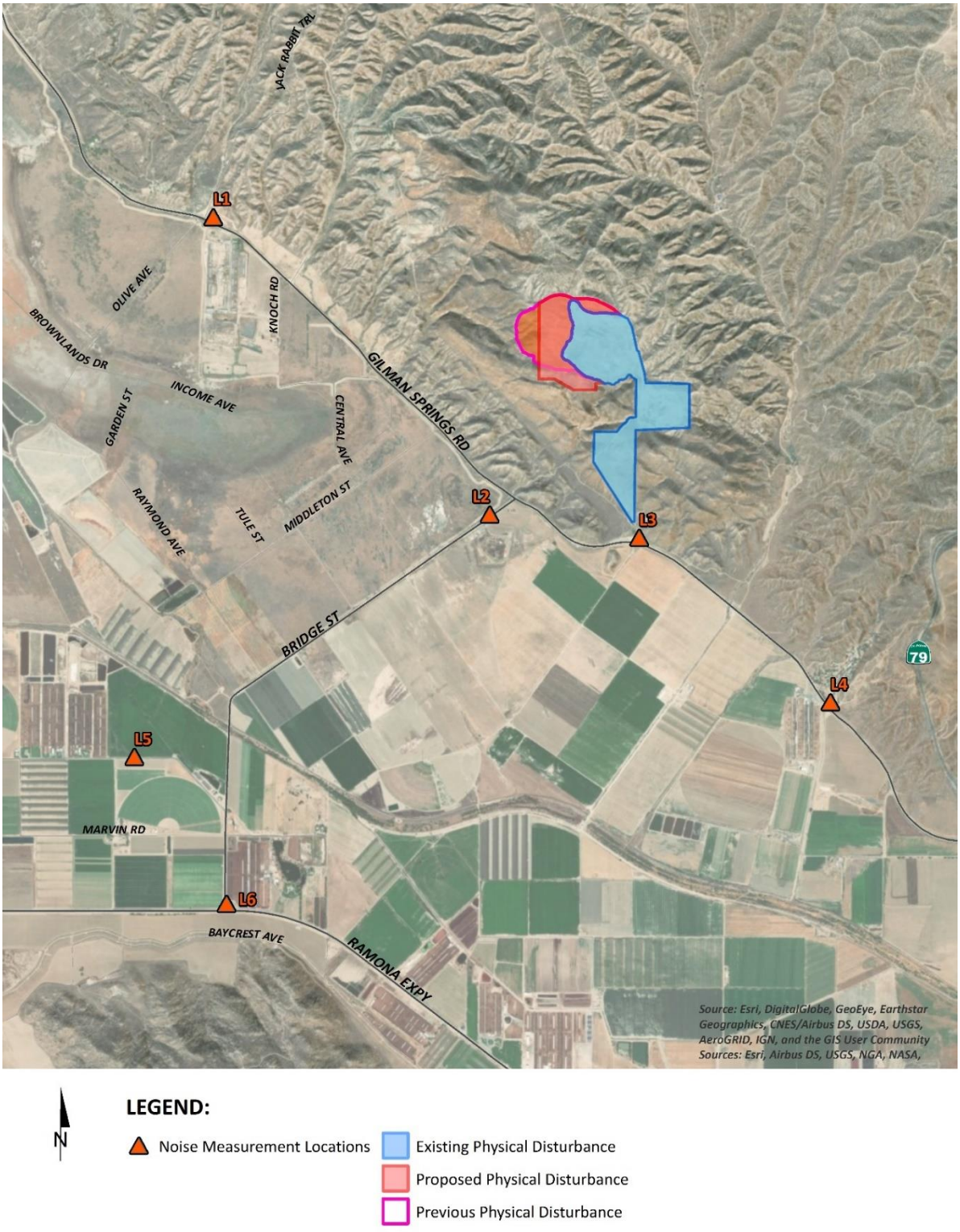
To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the daytime and nighttime hourly noise levels and calculate the 24-hour CNEL. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (18)

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent every part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that, *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources*. (3) Further, FTA guidance states, t*hat it is not necessary nor recommended that existing noise exposure be determined by measuring at every noise-sensitive location in the project area. Rather, the recommended approach is to characterize the noise environment for clusters of sites based on measurements or estimates at representative locations in the community*. (9) Based on recommendations of Caltrans and the FTA, it is not necessary to collect measurements at each individual building or residence, because each receiver measurement represents a group of buildings that share acoustical equivalence. (9) In other words, the area represented by the receiver shares similar shielding, terrain, and geometric relationship to the reference noise source. Receivers represent a location of noise sensitive areas and are used to estimate the future noise level impacts. Collecting reference ambient noise level measurements at the nearby sensitive receiver locations allows for a

comparison of the before and after Project noise levels and is necessary to assess potential noise impacts due to the Project's contribution to the ambient noise levels.

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS



5.3 NOISE MEASUREMENT RESULTS

The noise measurements presented below focus on the average or equivalent sound levels (L_{eq}). The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. Table 5-1 identifies the hourly daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) noise levels at each noise level measurement location. Appendix 5.2 provides a summary of the existing hourly ambient noise levels described below:

- Location L1 represents the noise levels northwest of the Project site on Gilman Springs Road near existing vacant land and agricultural uses. The background ambient noise levels near this location consist primarily of vehicular traffic on Gilman Springs Road. The noise level measurements collected show an overall 24-hour exterior noise level of 66.2 dBA CNEL. The hourly noise levels measured at location L1 ranged from 56.5 to 62.4 dBA L_{eq} during the daytime hours and from 55.1 to 63.2 dBA L_{eq} during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 59.8 dBA L_{eq} with an average nighttime noise level of 59.6 dBA L_{eq}.
- Location L2 represents the noise levels southwest of the Project site on Bridge Street near existing agricultural use. The primary source of background ambient noise in this rural agricultural area was from traffic noise on Bridge Street. The noise level measurements collected show an overall 24-hour exterior noise level of 67.3 dBA CNEL. The hourly noise levels measured at location L2 ranged from 59.8 to 65.9 dBA L_{eq} during the daytime hours and from 54.2 to 64.6 dBA L_{eq} during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 62.6 dBA L_{eq} with an average nighttime noise level of 59.9 dBA L_{eq}.
- Location L3 represents the noise levels south of the Project site on Gilman Springs Road adjacent to the entrance gate for the Project. Located near the Gilman Spring Mine entrance gate, the existing noise environment at this location is attributed to background traffic noise on Gilman Springs Road. The 24-hour CNEL indicates that the overall exterior noise level is 68.8 dBA CNEL. At location L3 the background ambient noise levels ranged from 58.5 to 66.3 dBA L_{eq} during the daytime hours to levels of 57.4 to 65.8 dBA L_{eq} during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 62.5 dBA L_{eq} with an average nighttime noise level of 62.1 dBA L_{eq}.
- Location L4 represents the noise levels south of the Project site on Gilman Springs Road near existing agricultural uses and the Victory Ranch Baptist Camp west of State Route 79. Traffic noise from Gilman Spring Road represents the primary source of background noise at this location. The noise level measurements collected show an overall 24-hour exterior noise level of 77.6 dBA CNEL. The hourly noise levels measured at location L4 ranged from 69.3 to 74.0 dBA L_{eq} during the daytime hours and from 66.5 to 74.3 dBA L_{eq} during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 71.5 dBA L_{eq} with an average nighttime noise level of 70.9 dBA L_{eq}.
- Location L5 represents the noise levels southwest of the Project site adjacent to existing agricultural uses on Main Street. In addition to the background traffic noise on Main Street, the noise levels at this location include agriculture watering activities. The 24-hour CNEL indicates that the overall exterior noise level is 72.2 dBA CNEL. At location L5 the background ambient noise levels ranged from 63.2 to 69.7 dBA L_{eq} during the daytime hours to levels of 56.7 to 71.0 dBA L_{eq} during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 66.7 dBA L_{eq} with an average nighttime noise level of 65.4 dBA L_{eq}.

- Location L6 represents the noise levels southwest of the Project site near existing agricultural uses on Bridge Street. Traffic noise from Ramona Expressway and Bridge Street represent the primary source of background ambient noise at this location. The noise level measurements collected show an overall 24-hour exterior noise level of 76.7 dBA CNEL. The hourly noise levels measured at location L6 ranged from 67.6 to 74.5 dBA Leq during the daytime hours and from 63.3 to 73.8 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 71.7 dBA Leq with an average nighttime noise level of 69.7 dBA Leq.

Table 5-1 provides the (energy average) noise levels used to describe the daytime and nighttime ambient conditions. These daytime and nighttime energy average noise levels represent the average of all hourly noise levels observed during these time periods expressed as a single number. Appendix 5.2 provides summary worksheets of the noise levels for each hour as well as the minimum, maximum, L_1, L_2, L_5, L_8, L_{25}, L_{50}, L_{90}, L_{95}, and L_{99} percentile noise levels observed during the daytime and nighttime periods. The background ambient noise levels in the Project study area are dominated by the transportation-related noise associated with the arterial roadway network. The 24-hour existing noise level measurements shown on Table 5-1 present the existing ambient noise conditions.

TABLE 5-1: 24-HOUR AMBIENT NOISE LEVEL MEASUREMENTS

Location[1]	Distance to Proposed Mining Limits (Miles)	Description	Energy Average Noise Level (dBA L_{eq})[2]		CNEL
			Daytime	Nighttime	
L1	1.6	Located northwest of the Project site on Gilman Springs Road near existing vacant land and agricultural uses.	59.8	59.6	66.2
L2	0.6	Located southwest of the Project site on Bridge Street near existing agricultural use.	62.6	59.9	67.3
L3	0.1	Located south of the Project site on Gilman Springs Road adjacent to the entrance gate for the Project.	62.5	62.1	68.8
L4	1.3	Located south of the Project site on Gilman Springs Road near existing agricultural uses and the Victory Ranch Baptist Camp west of State Route 79.	71.5	70.9	77.6
L5	2.7	Located southwest of the Project site adjacent to existing agricultural uses on Main Street.	66.7	65.4	72.2
L6	2.7	Located southwest of the Project site near existing agricultural uses on Bridge Street.	71.7	69.7	76.7

[1] See Exhibit 5-A for the noise level measurement locations.
[2] Energy (logarithmic) average hourly levels. The long-term 24-hour measurement worksheets are included in Appendix 5.2.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

6 METHODS AND PROCEDURES

The following section outlines the methods and procedures used to model and analyze the future traffic noise environment.

6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The expected roadway noise level increases from vehicular traffic were calculated by Urban Crossroads, Inc. using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (20) The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). In California the national REMELs are substituted with the California Vehicle Noise (Calveno) Emission Levels. (21) Adjustments are then made to the REMEL to account for: the roadway classification (e.g., collector, secondary, major or arterial), the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway), the total average daily traffic (ADT), the travel speed, the percentages of automobiles, medium trucks, and heavy trucks in the traffic volume, the roadway grade, the angle of view (e.g., whether the roadway view is blocked), the site conditions ("hard" or "soft" relates to the absorption of the ground, pavement, or landscaping), and the percentage of total ADT which flows each hour throughout a 24-hour period. Research conducted by Caltrans has shown that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model used in this analysis. (22) This methodology is consistent with the County of Riverside Office of Industrial Hygiene *Requirements for Determining and Mitigating Traffic Noise Impacts to Residential Structures*, which specifically requires the FHWA RD-77-108 model to be used in analysis within the County's jurisdiction. (14)

6.2 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-1 presents the roadway parameters used to assess the Project's off-site transportation noise impacts. Table 6-1 identifies the six study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications per the County of Riverside and City of Moreno Valley General Plan Circulation Element, and the posted vehicle speeds. Where posted vehicle speeds are unavailable, the 40-mph speed identified in the County of Riverside Office of Industrial Hygiene Noise Study Guidelines is used. The ADT volumes used in this study are presented on Table 6-2 are based on the *Gilman Springs Mine Traffic Impact Analysis* and the *Gilman Springs Mine Supplemental Traffic Assessment* prepared by Urban Crossroads, Inc., for the following traffic scenarios: Existing (2019), Existing plus Ambient Growth (EA) (2019), and EA plus Cumulative Development (EAC) (2019) conditions. (2)

Per the *Gilman Springs Mine Traffic Impact Analysis* and the *Gilman Springs Mine Supplemental Traffic Assessment* prepared by Urban Crossroads, Inc. the Project is expected to generate a net total of approximately 350 trip-ends per day (actual vehicles). (2) The Project trip generation includes 320 truck trip-ends per day. This noise study relies on the actual Project trips (as opposed to the passenger car equivalents) to accurately account for the effect of individual truck trips on the study area roadway network.

The ADT volumes vary for each roadway segment based on the existing traffic volumes and the combination of project traffic distributions. The *General Plan Noise Element* (13) requires that future on-site traffic noise impacts be assessed using the maximum capacity design standard for highways and major roads. However, this analysis relies on a comparative analysis of the off-site traffic noise impacts, without and with project ADT traffic volumes from the Project traffic study. The use of the maximum capacity design standards is typically reserved for determining the future long-range on-site traffic noise impacts, not the comparative contributions associated with the off-site Project traffic noise level impacts.

To quantify the off-site noise levels, the Project related truck trips were added to the heavy truck category in the FHWA noise prediction model. The addition of the Project related truck trips increases the percentage of heavy trucks in the vehicle mix.

This approach recognizes that the FHWA noise prediction model is significantly influenced by the number of heavy trucks in the vehicle mix. Table 6-3 provides the time of day (daytime, evening, and nighttime) vehicle splits. The daily Project truck trip-ends were assigned to the individual off-site study area roadway segments based on the Project truck trip distribution percentages documented in the *Traffic Impact Analysis*. Using the Project truck trips in combination with the Project trip distribution, Urban Crossroads, Inc. calculated the number of additional Project truck trips and vehicle mix percentages for each of the study area roadway segments. Table 6-4 shows the traffic flow by vehicle type (vehicle mix) used for all without Project traffic scenarios, and Tables 6-5 to 6-7 show the vehicle mixes used for the with Project traffic scenarios.

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Adjacent Planned (Existing if Different) Land Use[1]	Distance from Centerline to Nearest Adjacent Land Use (Feet)[2]	Vehicle Speed (mph)[3]
1	Gilman Springs Rd.	s/o SR-60	Residential/Business Park (Vacant)	50'	55
2	Gilman Springs Rd.	s/o Alessandro Bl.	Residential/Business Park (Vacant)	50'	55
3	Gilman Springs Rd.	s/o Jack Rabbit Tr.	Agriculture/Residential	64'	55
4	Gilman Springs Rd.	s/o Bridge St.	Agriculture	64'	55
5	Gilman Springs Rd.	n/o SR-79	Commercial/Agriculture	64'	55
6	Bridge St.	w/o Gilman Springs Rd.	Agriculture	50'	55

[1] Sources: County of Riverside Reche Canyon/Badlands and San Jacinto Valley Land Use Plans, and the City of Moreno Valley Land Use Map.
[2] Distance to adjacent land use is based upon the right-of-way distances for each functional roadway classification provided in the General Plan Circulation Elements of the County of Riverside and City of Moreno Valley.
[3] Source: Gilman Springs Mine Traffic Impact Analysis, April 2018.

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes[1]					
			Existing		Existing plus Ambient Growth (EA)		EA plus Cumulative Development (EAC)	
			Without Project	With Project	Without Project	With Project	Without Project	With Project
1	Gilman Springs Rd.	s/o SR-60	24,989	25,195	25,488	25,694	26,262	26,468
2	Gilman Springs Rd.	s/o Allesandro Bl.	29,420	29,629	30,608	30,817	30,892	31,101
3	Gilman Springs Rd.	s/o Jack Rabbit Tr.	29,402	29,612	30,590	30,800	30,881	31,091
4	Gilman Springs Rd.	s/o Bridge St.	25,484	25,726	26,513	26,755	26,677	26,919
5	Gilman Springs Rd.	n/o SR-79	27,943	28,051	29,072	29,180	29,238	29,346
6	Bridge St.	w/o Gilman Springs Rd.	2,507	2,539	2,608	2,640	2,852	2,884

[1] Source: Gilman Springs Mine Supplemental Traffic Assessment.

TABLE 6-3: TIME OF DAY VEHICLE SPLITS

Vehicle Type	Time of Day Splits			Total of Time of Day Splits
	Daytime	Evening	Nighttime	
Autos	66.90%	11.92%	21.17%	100.00%
Medium Trucks	64.84%	8.49%	26.68%	100.00%
Heavy Trucks	72.54%	4.69%	22.77%	100.00%

Based on an existing 24-hour vehicle count taken at Gilman Springs Road south of Bridge Street (Gilman Springs Mine Traffic Impact Analysis, April 2018.). Vehicle mix percentage values rounded to the nearest one-hundredth.
"Daytime" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

TABLE 6-4: WITHOUT PROJECT CONDITIONS VEHICLE MIX

Classification	Total % Traffic Flow			Total
	Autos	Medium Trucks	Heavy Trucks	
All Segments	90.41%	7.53%	2.06%	100.00%

Based on an existing 24-hour vehicle count taken at Gilman Springs Road south of Bridge Street (Gilman Springs Mine Traffic Impact Analysis).
Vehicle mix percentage values rounded to the nearest one-hundredth.

TABLE 6-5: EXISTING (2019) WITH PROJECT CONDITIONS VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	Gilman Springs Rd.	s/o SR-60	89.73%	7.47%	2.80%	100.00%
2	Gilman Springs Rd.	s/o Allesandro Bl.	89.83%	7.48%	2.69%	100.00%
3	Gilman Springs Rd.	s/o Jack Rabbit Tr.	89.83%	7.48%	2.69%	100.00%
4	Gilman Springs Rd.	s/o Bridge St.	89.63%	7.46%	2.91%	100.00%
5	Gilman Springs Rd.	n/o SR-79	90.11%	7.50%	2.39%	100.00%
6	Bridge St.	w/o Gilman Springs Rd.	89.27%	7.43%	3.29%	100.00%

[1] Source: Gilman Springs Mine Supplemental Traffic Assessment.
[2] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

TABLE 6-6: EA (2019) WITH PROJECT CONDITIONS VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	Gilman Springs Rd.	s/o SR-60	89.74%	7.47%	2.79%	100.00%
2	Gilman Springs Rd.	s/o Allesandro Bl.	89.85%	7.48%	2.67%	100.00%
3	Gilman Springs Rd.	s/o Jack Rabbit Tr.	89.85%	7.48%	2.67%	100.00%
4	Gilman Springs Rd.	s/o Bridge St.	89.66%	7.46%	2.88%	100.00%
5	Gilman Springs Rd.	n/o SR-79	90.12%	7.50%	2.38%	100.00%
6	Bridge St.	w/o Gilman Springs Rd.	89.32%	7.44%	3.25%	100.00%

[1] Source: Gilman Springs Mine Supplemental Traffic Assessment.
[2] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

TABLE 6-7: EAC (2019) WITH PROJECT CONDITIONS VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	Gilman Springs Rd.	s/o SR-60	89.76%	7.47%	2.77%	100.00%
2	Gilman Springs Rd.	s/o Allesandro Bl.	89.86%	7.48%	2.66%	100.00%
3	Gilman Springs Rd.	s/o Jack Rabbit Tr.	89.86%	7.48%	2.66%	100.00%
4	Gilman Springs Rd.	s/o Bridge St.	89.67%	7.46%	2.87%	100.00%
5	Gilman Springs Rd.	n/o SR-79	90.12%	7.50%	2.38%	100.00%
6	Bridge St.	w/o Gilman Springs Rd.	89.41%	7.45%	3.15%	100.00%

[1] Source: Gilman Springs Mine Supplemental Traffic Assessment.
[2] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

7 OFF-SITE TRANSPORTATION NOISE IMPACTS

To assess the off-site transportation CNEL noise level impacts associated with development of the proposed Project, noise contours were developed based on *Gilman Springs Mine Traffic Impact Analysis* and the *Gilman Springs Mine Supplement Traffic Assessment*. (2) Noise contour boundaries represent the equal levels of noise exposure and are measured in CNEL from the center of the roadway. Noise contours were developed for the following traffic scenarios:

- Existing Conditions (2019) Without / With Project: This scenario refers to the existing present-day noise conditions without and with the proposed Project.
- Existing plus Ambient Growth (EA) (2019) Without / With the Project: This scenario refers to Existing plus Ambient Growth noise conditions without and with the proposed Project.
- EA plus Cumulative Development (EAC) (2019) Without / With the Project: This scenario refers to Existing plus Ambient Growth plus Cumulative Development noise conditions without and with the proposed Project. This scenario includes all cumulative projects identified in the Traffic Impact Analysis.

7.1 TRAFFIC NOISE CONTOURS

Noise contours were used to assess the Project's incremental traffic-related noise impacts at land uses adjacent to roadways conveying Project traffic. The noise contours represent the distance to noise levels of a constant value and are measured from the center of the roadway for the 70, 65, and 60 dBA noise levels. The noise contours do not consider the effect of any existing noise barriers or topography that may attenuate ambient noise levels. In addition, because the noise contours reflect modeling of vehicular noise on area roadways, they appropriately do not reflect noise contributions from the surrounding stationary noise sources within the Project study area. Tables 7-1 through 7-6 present a summary of the exterior traffic noise levels, without barrier attenuation, for the six study area roadway segments analyzed from the without Project to the with Project conditions in each of the following timeframes: Existing (2019), EA (2019), and EAC (2019) traffic conditions. Appendix 7.1 includes a summary of the traffic noise level contours for each of the traffic scenarios.

TABLE 7-1: EXISTING (2019) WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned (Existing) Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Gilman Springs Rd.	s/o SR-60	Residential/Business Park (Vacant)	78.2	176	379	817
2	Gilman Springs Rd.	s/o Allesandro Bl.	Residential/Business Park (Vacant)	78.9	196	423	911
3	Gilman Springs Rd.	s/o Jack Rabbit Tr.	Agriculture/Residential	76.7	180	387	834
4	Gilman Springs Rd.	s/o Bridge St.	Agriculture	76.1	163	352	758
5	Gilman Springs Rd.	n/o SR-79	Commercial/Agriculture	76.5	174	374	806
6	Bridge St.	w/o Gilman Springs Rd.	Agriculture	67.3	RW	72	154

[1] Sources: County of Riverside Reche Canyon/Badlands and San Jacinto Valley Land Use Plans, and the City of Moreno Valley Land Use Map.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-2: EXISTING (2019) WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned (Existing) Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Gilman Springs Rd.	s/o SR-60	Residential/Business Park (Vacant)	78.6	186	402	866
2	Gilman Springs Rd.	s/o Allesandro Bl.	Residential/Business Park (Vacant)	79.2	206	444	957
3	Gilman Springs Rd.	s/o Jack Rabbit Tr.	Agriculture/Residential	77.0	189	407	876
4	Gilman Springs Rd.	s/o Bridge St.	Agriculture	76.5	174	376	809
5	Gilman Springs Rd.	n/o SR-79	Commercial/Agriculture	76.7	178	384	828
6	Bridge St.	w/o Gilman Springs Rd.	Agriculture	67.9	RW	79	169

[1] Sources: County of Riverside Reche Canyon/Badlands and San Jacinto Valley Land Use Plans, and the City of Moreno Valley Land Use Map.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-3: EA (2019) WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned (Existing) Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Gilman Springs Rd.	s/o SR-60	Residential/Business Park (Vacant)	78.3	178	384	828
2	Gilman Springs Rd.	s/o Allesandro Bl.	Residential/Business Park (Vacant)	79.1	202	434	936
3	Gilman Springs Rd.	s/o Jack Rabbit Tr.	Agriculture/Residential	76.9	185	398	857
4	Gilman Springs Rd.	s/o Bridge St.	Agriculture	76.3	168	361	779
5	Gilman Springs Rd.	n/o SR-79	Commercial/Agriculture	76.7	178	384	828
6	Bridge St.	w/o Gilman Springs Rd.	Agriculture	67.5	RW	74	158

[1] Sources: County of Riverside Reche Canyon/Badlands and San Jacinto Valley Land Use Plans, and the City of Moreno Valley Land Use Map.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-4: EA (2019) WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned (Existing) Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Gilman Springs Rd.	s/o SR-60	Residential/Business Park (Vacant)	78.7	189	407	876
2	Gilman Springs Rd.	s/o Allesandro Bl.	Residential/Business Park (Vacant)	79.4	211	455	981
3	Gilman Springs Rd.	s/o Jack Rabbit Tr.	Agriculture/Residential	77.2	193	417	898
4	Gilman Springs Rd.	s/o Bridge St.	Agriculture	76.7	179	385	829
5	Gilman Springs Rd.	n/o SR-79	Commercial/Agriculture	76.8	183	394	849
6	Bridge St.	w/o Gilman Springs Rd.	Agriculture	68.1	RW	80	173

[1] Sources: County of Riverside Reche Canyon/Badlands and San Jacinto Valley Land Use Plans, and the City of Moreno Valley Land Use Map.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-5: EAC (2019) WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned (Existing) Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Gilman Springs Rd.	s/o SR-60	Residential/Business Park (Vacant)	78.4	182	392	845
2	Gilman Springs Rd.	s/o Allesandro Bl.	Residential/Business Park (Vacant)	79.1	203	437	942
3	Gilman Springs Rd.	s/o Jack Rabbit Tr.	Agriculture/Residential	76.9	186	400	862
4	Gilman Springs Rd.	s/o Bridge St.	Agriculture	76.3	168	363	782
5	Gilman Springs Rd.	n/o SR-79	Commercial/Agriculture	76.7	179	386	831
6	Bridge St.	w/o Gilman Springs Rd.	Agriculture	67.9	RW	78	168

[1] Sources: County of Riverside Reche Canyon/Badlands and San Jacinto Valley Land Use Plans, and the City of Moreno Valley Land Use Map.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-6: EAC (2019) WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned (Existing) Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Gilman Springs Rd.	s/o SR-60	Residential/Business Park (Vacant)	78.8	192	414	892
2	Gilman Springs Rd.	s/o Allesandro Bl.	Residential/Business Park (Vacant)	79.4	213	458	987
3	Gilman Springs Rd.	s/o Jack Rabbit Tr.	Agriculture/Residential	77.2	195	419	903
4	Gilman Springs Rd.	s/o Bridge St.	Agriculture	76.7	179	386	832
5	Gilman Springs Rd.	n/o SR-79	Commercial/Agriculture	76.9	184	396	852
6	Bridge St.	w/o Gilman Springs Rd.	Agriculture	68.4	RW	85	182

[1] Sources: County of Riverside Reche Canyon/Badlands and San Jacinto Valley Land Use Plans, and the City of Moreno Valley Land Use Map.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

7.2 EXISTING CONDITIONS PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-1 shows the Existing (2019) without Project conditions CNEL noise levels. The without Project exterior noise levels are expected to range from 67.3 to 78.9 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-2 shows the Existing (2019) with Project conditions will range from 67.9 to 79.2 dBA CNEL. Table 7-7 shows that the Project off-site traffic noise level increases range from0.2 to 0.6 dBA CNEL on the study area roadway segments.

TABLE 7-7: UNMITIGATED EXISTING (2019) WITH PROJECT TRAFFIC NOISE INCREASES

ID	Road	Segment	CNEL at Adjacent Land Use (dBA)[1]			Noise-Sensitive Land Use?	Threshold Exceeded?[2]
			No Project	With Project	Project Addition		
1	Gilman Springs Rd.	s/o SR-60	78.2	78.6	0.4	Yes	No
2	Gilman Springs Rd.	s/o Allesandro Bl.	78.9	79.2	0.3	Yes	No
3	Gilman Springs Rd.	s/o Jack Rabbit Tr.	76.7	77.0	0.3	Yes	No
4	Gilman Springs Rd.	s/o Bridge St.	76.1	76.5	0.4	No	No
5	Gilman Springs Rd.	n/o SR-79	76.5	76.7	0.2	No	No
6	Bridge St.	w/o Gilman Springs Rd.	67.3	67.9	0.6	No	No

[1] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
[2] Based on the off-site traffic noise level impact significance criteria (Section 4 of the NIA).

7.3 EA (2019) PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-3 presents the Existing plus Ambient Growth (EA) (2019) without Project conditions CNEL noise levels. The EA (2019) without Project exterior noise levels are expected to range from 67.5 to 79.1 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-4 shows the EA (2019) with Project conditions will range from 68.1 to 79.4 dBA CNEL. Table 7-8 shows that the Project off-site traffic noise level increases will range from 0.2 to 0.6 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-2, land uses adjacent to the study area roadway segments would experience *less than significant* noise level impacts due to unmitigated Project-related traffic noise levels.

TABLE 7-8: UNMITIGATED EA (2019) WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	CNEL at Adjacent Land Use (dBA)[1]			Noise-Sensitive Land Use?	Threshold Exceeded?[2]
			No Project	With Project	Project Addition		
1	Gilman Springs Rd.	s/o SR-60	78.3	78.7	0.4	Yes	No
2	Gilman Springs Rd.	s/o Allesandro Bl.	79.1	79.4	0.3	Yes	No
3	Gilman Springs Rd.	s/o Jack Rabbit Tr.	76.9	77.2	0.3	Yes	No
4	Gilman Springs Rd.	s/o Bridge St.	76.3	76.7	0.4	No	No
5	Gilman Springs Rd.	n/o SR-79	76.7	76.8	0.2	No	No
6	Bridge St.	w/o Gilman Springs Rd.	67.5	68.1	0.6	No	No

[1] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
[2] Based on the off-site traffic noise level impact significance criteria (Section 4 of the NIA).

7.4 EAC (2019) TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-5 presents the Existing plus Ambient Growth plus Cumulative (EAC) (2019) without Project conditions CNEL noise levels. The EAC without Project exterior noise levels are expected to range from 67.9 to 79.1 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-6 shows the EAC (2019) with Project conditions will range from 68.4 to 79.4 dBA CNEL. Table 7-9 shows that the Project off-site traffic noise level increases will range from 0.2 to 0.5 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-2, land uses adjacent to the study area roadway segments would experience *less than significant* noise level impacts due to unmitigated Project-related traffic noise levels.

TABLE 7-9: UNMITIGATED EAC (2019) WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	CNEL at Adjacent Land Use (dBA)[1]			Noise-Sensitive Land Use?	Threshold Exceeded?[2]
			No Project	With Project	Project Addition		
1	Gilman Springs Rd.	s/o SR-60	78.4	78.8	0.4	Yes	No
2	Gilman Springs Rd.	s/o Allesandro Bl.	79.1	79.4	0.3	Yes	No
3	Gilman Springs Rd.	s/o Jack Rabbit Tr.	76.9	77.2	0.3	Yes	No
4	Gilman Springs Rd.	s/o Bridge St.	76.3	76.7	0.4	No	No
5	Gilman Springs Rd.	n/o SR-79	76.7	76.9	0.2	No	No
6	Bridge St.	w/o Gilman Springs Rd.	67.9	68.4	0.5	No	No

[1] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
[2] Based on the off-site traffic noise level impact significance criteria (Section 4 of the NIA).

8 SENSITIVE RECEIVER LOCATIONS

To assess the potential for long-term operational noise impacts, the following four sensitive receiver locations as shown on Exhibit 8-A were identified as representative locations for analysis. Sensitive receivers are generally defined as locations where people reside or where the presence of unwanted sound could otherwise adversely affect the use of the land. Noise-sensitive land uses are generally considered to include schools, hospitals, single-family dwellings, mobile home parks, churches, libraries, and recreation areas. Moderately noise-sensitive land uses typically include multi-family dwellings, hotels, motels, dormitories, out-patient clinics, cemeteries, golf courses, country clubs, athletic/tennis clubs, and equestrian clubs. Land uses that are considered relatively insensitive to noise include business, commercial, and professional developments. Land uses that are typically not affected by noise include: industrial, manufacturing, utilities, agriculture, undeveloped land, parking lots, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

Receiver locations are located in outdoor living areas (e.g., backyards) at 10 feet from any existing or proposed barriers or at the building façade, whichever is closer to the Project site, based on FHWA guidance, and consistent with additional guidance provided by Caltrans and the FTA, as previously described in Section 5.2. Sensitive receiver locations in the Project study area include residential uses, as described below. Other sensitive land uses in the Project study area that are located at greater distances than those identified in this noise study will experience lower noise levels than those presented in this report due to the additional attenuation from distance and the shielding of intervening structures.

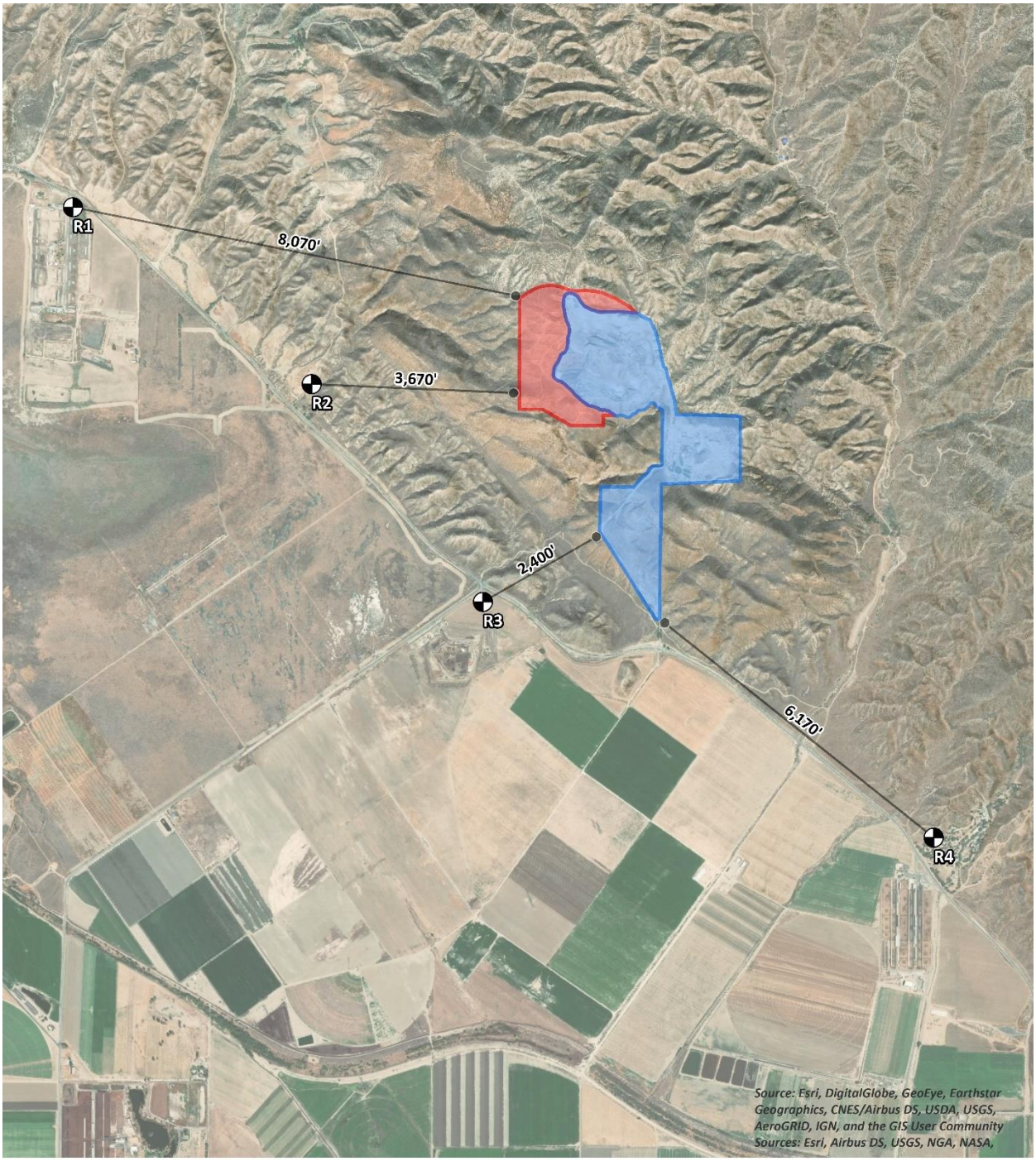
R1: Located approximately 8,070 feet west of the proposed mining limits, R1 represents an existing residential home located on Knoch Road. A 24-hour noise level measurement was taken near this location, L1, to describe the existing ambient noise environment.

R2: Location R2 represents an existing residential home located approximately 3,670feet west of the proposed mining limits north of Gilman Springs Road. The lowest of the 24-hour ambient noise level measurements (location L1), previously shown on Table 5-1, is used to describe this location to present a conservative without Project condition for operational noise analysis.

R3: Location R3 represents the existing agricultural use that includes an existing single-family residence located roughly 2,400 feet south of the proposed mining limits on Bridge Street. A 24-hour noise level measurement was taken near this location, L2, to describe the existing ambient noise environment.

R4: Location R4 represents the existing Victory Ranch Baptist Church Camp located roughly 6,170 feet southeast of the proposed mining limits. A 24-hour noise level measurement was taken near this location, L4, to describe the existing ambient noise environment.

EXHIBIT 8-A: SENSITIVE RECEIVER LOCATIONS



9 OPERATIONAL NOISE IMPACTS

This section analyzes the potential stationary-source operational noise impacts at the nearby receiver locations, identified in Section 8, resulting from the operation of the proposed Gilman Springs Mine. Exhibit 9-A identifies the noise source locations used to assess the operational noise levels. Appendix 9.1 includes the detailed calculations for the Project operational noise levels presented in this section.

9.1 OPERATIONAL NOISE SOURCES

The on-site Project-related noise sources are expected to include: crushing and screening activities, loader activities and backup alarms, haul truck loading and pass-by events in combination with heavy equipment and dozer activity. This noise analysis is intended to describe noise level impacts associated with the expected typical operational activities at the Project site.

9.2 REFERENCE NOISE LEVELS

To estimate the Project operational noise impacts, reference noise level measurements were collected from similar types of activities to represent the noise levels expected with the development of the proposed Project. This section provides a detailed description of the reference noise level measurements shown on Table 9-1 used to estimate the Project operational noise impacts. It is important to note that the following projected noise levels assume the worst-case noise environment with the crushing and screening activities, loader activities and backup alarms, haul truck loading and pass-by events in combination with heavy equipment and dozer activity all operating continuously. These sources of noise activity will likely vary throughout the day. Appendix 9.2 provides reference measurement photos for each noise source.

9.2.1 MEASUREMENT PROCEDURES

The reference noise level measurements presented in this section were collected using a Larson Davis LxT Type 1 precisions sound level meter (serial number 01146). The LxT sound level meter was calibrated using a Larson-Davis calibrator, Model CAL 200, was programmed in "slow" mode to record noise levels in "A" weighted form and was located at approximately five feet above the ground elevation for each measurement. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (18)

EXHIBIT 9-A: OPERATIONAL NOISE SOURCE LOCATIONS

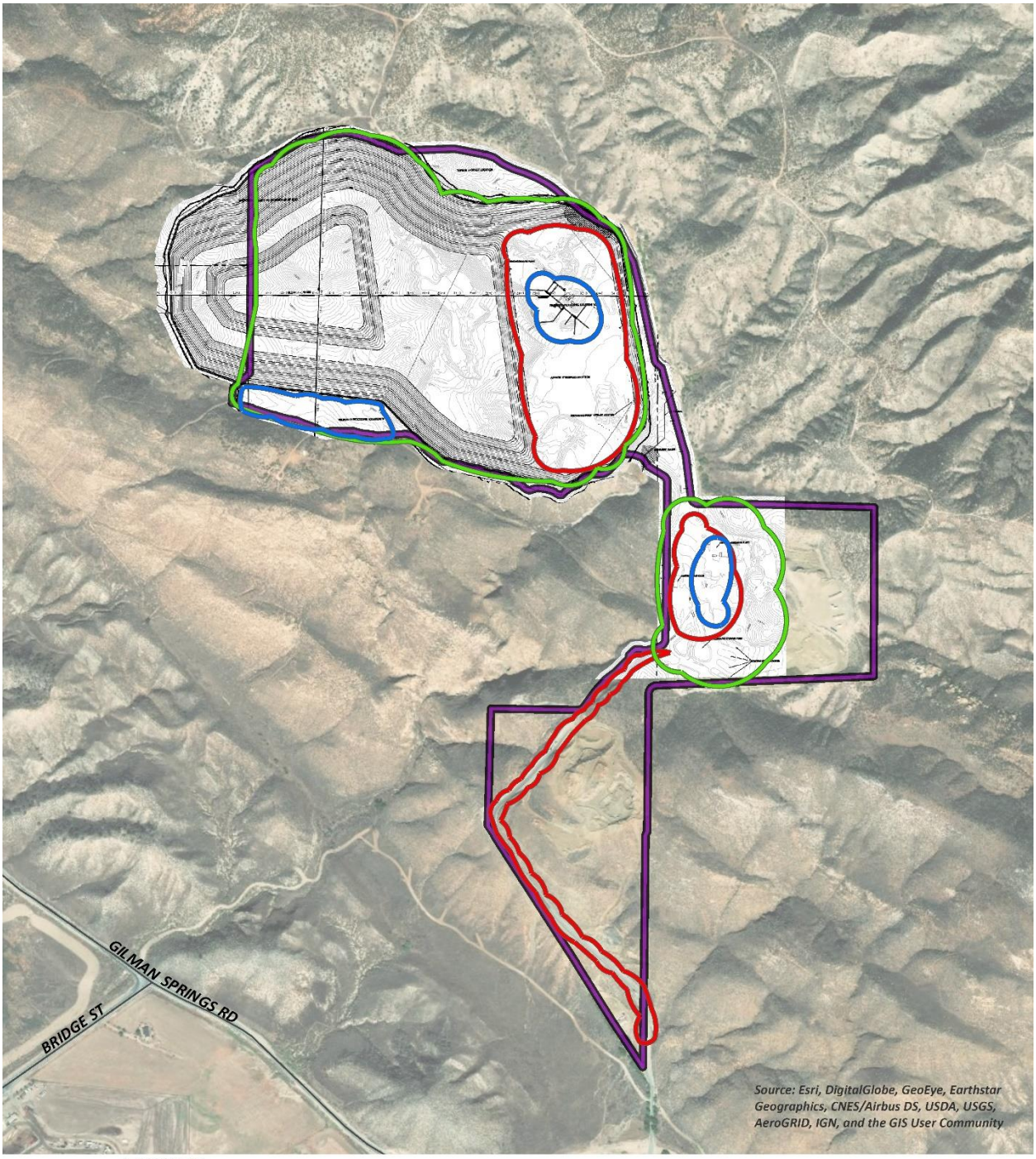


TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source[1]	Duration (hh:mm:ss)	Ref. Distance (Feet)	Noise Source Height (Feet)	Reference Noise Level (dBA L_{eq})	
				@ Ref. Dist.	@ 50 Feet
Crushing & Screening Activity[1]	00:00:20	30'	30'	72.7	68.3
Loader Activity & Backup Alarms[1]	00:00:10	30'	8'	79.8	75.4
Haul Truck Loading & Pass-bys[1]	00:00:10	50'	12'	62.1	62.1
Heavy Equipment & Dozers[2]	00:00:32	30'	8'	84.0	79.6

[1] As measured by Urban Crossroads, Inc. on 10/27/2015 at the Robertson's quarry in the City of Banning.
[2] As measured by Urban Crossroads, Inc. on 10/20/2015 at a construction site located in Rancho Mission Viejo.

9.2.2 CRUSHING & SCREENING ACTIVITY

To assess the potential noise impacts created by the crushing and screening activities at the Project site, reference noise levels measurements were taken of the existing crushing and screening equipment on October 27th, 2015 in the City of Banning at the Robertson's quarry. During the mining operations, aggregate materials are separated by size into loose conical stockpiles near the crushing and screening equipment. Any coarse gravel or larger particles are crushed to produce graded sand and crushed-rock aggregates which are then transported using haul trucks. The reference crushing and screening activity noise level measurement includes a haul truck pass-by and crushing and screening equipment activities. At a uniform reference distance of approximately 50 feet from the crusher with a noise source height of roughly 30 feet, the exterior noise levels were measured at 68.3 dBA L_{eq}. The crushing and screening activities are expected to occur for the full hour under peak operating conditions at the Project site.

9.2.3 LOADER ACTIVITY & BACKUP ALARMS

To assess the potential noise impacts created by loaders during mining operations within the Project site, a reference noise level measurement was taken at the Robertson's quarry in the City of Banning on October 27th, 2015. The reference noise level measurement represents the typical operation of a 988G Caterpillar wheel loader including forward and backward movements, and backup alarm noise. At a uniform reference distance of 50 feet from the loader, the reference noise level is 75.4 dBA L_{eq}. The loader activity and backup alarms are estimated to occur for the full hour during the peak hour conditions.

9.2.4 HAUL TRUCK LOADING ACTIVITY

To describe the potential noise level impacts associated with haul truck loading of aggregate materials, a reference noise level measurement was collected on October 27th, 2015 at the Robertson's quarry in the City of Banning. The reference noise level measurement includes the movement of aggregate material on an overhead conveyor belt into a metal bin, the loading of haul truck trailers beneath the bin, and haul truck pass-by events. At 50 feet from the noise source, a reference noise level of 62.1 dBA L_{eq} was measured. The haul truck loading activities are estimated to occur for the full hour during the peak hour conditions.

9.2.5 HEAVY EQUIPMENT & DOZER ACTIVITY

On Tuesday, October 20th, 2015, Urban Crossroads, Inc. collected short-term construction noise level measurements to describe rough grading activities in unincorporated area of Rancho Mission Viejo within the County of Orange. The reference noise level measurements describe a combination heavy equipment that includes several dozers, scrapers, water trucks and other rough grading activities. All reference measurements were taken at approximately 30 feet from the noise source. During peak activity, a reference noise level of 84.0 dBA L_{eq} was measured.

9.3 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed Project operations that include crushing and screening activities, loader activities and backup alarms, haul truck loading and pass-by events in combination with heavy equipment and dozer activity, Urban Crossroads, Inc. calculated the operational source noise levels that are expected to be generated at the Project site and the Project-related noise level increases that would be experienced at each of the sensitive receiver locations. The operational noise level calculations shown on Table 9-2 account for the distance attenuation provided due to geometric spreading, when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. Hard site conditions are used in the operational noise analysis which result in noise levels that attenuate (or decrease) at a rate of 6 dBA for each doubling of distance from a point source. The basic noise attenuation equation shown below is used to calculate the distance attenuation based on a reference noise level (SPL_1):

$$SPL_2 = SPL_1 - 20\log(D_2/D_1)$$

Where SPL_2 is the resulting noise level after attenuation, SPL_1 is the source noise level, D_2 is the distance to the reference sound pressure level (SPL_1), and D_1 is the distance to the receiver location.

TABLE 9-2: UNMITIGATED PROJECT OPERATIONAL NOISE LEVELS

Receiver Location[1]	Noise Source[2]	Project Operational Noise Levels (dBA L_{eq})[3]
R1	Crushing & Screening Activity	23.8
	Loader Activity & Backup Alarms	31.1
	Heavy Equipment & Dozers	35.3
	Haul Truck Loading & Pass-bys	16.3
	Combined Noise Level:	37.0
R2	Crushing & Screening Activity	30.8
	Loader Activity & Backup Alarms	37.9
	Heavy Equipment & Dozers	42.1
	Haul Truck Loading & Pass-bys	21.4
	Combined Noise Level:	43.8
R3	Crushing & Screening Activity	30.6
	Loader Activity & Backup Alarms	37.4
	Heavy Equipment & Dozers	41.6
	Haul Truck Loading & Pass-bys	28.1
	Combined Noise Level:	43.4
R4	Crushing & Screening Activity	24.1
	Loader Activity & Backup Alarms	31.6
	Heavy Equipment & Dozers	35.8
	Haul Truck Loading & Pass-bys	20.0
	Combined Noise Level:	37.5

[1] See Exhibit 9-A for the receiver and noise source locations.
[2] Reference noise sources as shown on Table 9-1.
[3] Operational noise level calculations are provided in Appendix 9.3.

Table 9-2 shows the individual operational noise levels of each noise source at each of the nearby sensitive receiver locations. As indicated on Table 9-2, the Project-only operational noise levels will range from 37.0 to 43.8 dBA L_{eq} at the sensitive receiver locations. The Project operational noise level calculations include the attenuation provided by the difference in elevation between the Project noise sources and receiver locations, where applicable. To present a conservative approach, both Loader Activity and Backup Alarms as well as the Heavy Equipment and Dozers truck unloading/docking activity have been combined and placed near the boundary.

To demonstrate compliance with local noise regulations, the Project-only operational noise levels are evaluated against exterior noise level thresholds based on the County of Riverside exterior noise level standards at nearby noise-sensitive receiver locations. Table 9-3 shows the operational noise levels associated with Gilman Springs Mine Project will satisfy the exterior noise level standards at all nearby receiver locations. Therefore, operational noise impacts are considered *less than significant* at the nearby noise-sensitive receiver location.

TABLE 9-3: UNMITIGATED OPERATIONAL NOISE LEVEL COMPLIANCE

Receiver Location[1]	Noise Level at Receiver Locations (dBA L_{eq})[2]	Threshold Exceeded?[3]	
		Daytime (65 dBA L_{eq})	Nighttime (45 dBA L_{eq})
R1	37.0	No	No
R2	43.8	No	No
R3	43.4	No	No
R4	37.5	No	No

[1] See Exhibit 9-A for the receiver and noise source locations.
[2] Estimated Project operational noise levels as shown on Table 9-2.
[3] Do the estimated Project operational noise levels meet the operational noise level standards (Table 3-1)? "Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

9.4 PROJECT OPERATIONAL NOISE LEVEL CONTRIBUTIONS

To describe the Project operational noise level contributions, the Project operational noise levels are combined with the existing ambient noise levels measurements for nearby receiver locations potentially impacted by Project operational noise sources. Since the units used to measure noise, decibels (dB), are logarithmic units, the Project-operational and existing ambient noise levels cannot be combined using standard arithmetic equations. (3) Instead, they must be logarithmically added using the following base equation:

$$SPL_{Total} = 10\log_{10}[10^{SPL1/10} + 10^{SPL2/10} + \ldots 10^{SPLn/10}]$$

Where "SPL1," "SPL2," etc. are equal to the sound pressure levels being combined, or in this case, the Project-operational and existing ambient noise levels. The difference between the combined Project and ambient noise levels describe the Project noise level contributions to the existing ambient noise environment. Noise levels that would be experienced at receiver locations when Project-source noise is added to the daytime and nighttime ambient conditions are presented on Tables 9-4 and 9-5, respectively.

As indicated on Table 9-4 the Project will generate an unmitigated daytime operational noise level increase of up to 0.1 dBA L_{eq} at the nearby receiver locations. Table 9-5 indicates that the Project will generate an unmitigated nighttime operational noise level increase of up to 0.1 dBA L_{eq} at the nearby receiver locations. Since the Project-related operational noise level contributions will satisfy the operational noise level increase significance criteria presented in Table 4-2, the increases at the sensitive receiver locations will be *less than significant*. The operational noise analysis supports the continuous 24-hour operation of the Project.

TABLE 9-4: DAYTIME OPERATIONAL NOISE LEVEL CONTRIBUTIONS

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Contribution[6]	Threshold Exceeded?[7]
R1	37.0	L1	59.8	59.8	0.0	No
R2	43.8	L1	59.8	59.9	0.1	No
R3	43.4	L2	62.6	62.7	0.1	No
R4	37.5	L4	71.5	71.5	0.0	No

[1] See Exhibit 9-A for the sensitive receiver locations.
[2] Total Project operational noise levels as shown on Table 9-3.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed daytime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance Criteria as defined in Section 4.

TABLE 9-5: NIGHTTIME OPERATIONAL NOISE LEVEL CONTRIBUTIONS

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Contribution[6]	Threshold Exceeded?[7]
R1	37.0	L1	59.6	59.6	0.0	No
R2	43.8	L1	59.6	59.7	0.1	No
R3	43.4	L2	59.9	60.0	0.1	No
R4	37.5	L4	70.9	70.9	0.0	No

[1] See Exhibit 9-A for the sensitive receiver locations.
[2] Total Project operational noise levels as shown on Table 9-3.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed nighttime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance Criteria as defined in Section 4.

9.5 OPERATIONAL VIBRATION IMPACTS

To assess the potential vibration impacts from truck haul trips associated with operational activities the County of Riverside threshold for vibration of 0.01 in/sec RMS is used. Truck vibration levels are dependent on vehicle characteristics, load, speed, and pavement conditions. According to the FTA *Transit Noise Impact and Vibration Assessment,* (9) trucks rarely create vibration that exceeds 70 VdB or 0.003 in/sec RMS (10) (unless there are bumps due to frequent potholes in the road. Trucks transiting on site will be travelling at very low speeds so it is expected that delivery truck vibration impacts at nearby homes will satisfy the County of Riverside vibration threshold of 0.01 in/sec RMS, and therefore, will be *less than significant*.

9.6 BLASTING IMPACTS

Blasting is a component of current operations within the Project site. Historically, the amount of blasting within the existing site has depended on production needs and development and has averaged approximately six to nine blasts per year. Blasting would be required to occur in areas of the Project site where vegetation has already been removed. Specifically, blasting would continue to be conducted on-site in a planned and intermittent basis at a maximum of 15 blasts per year, averaging between six and nine blasts per year. The relationship between tonnage production and number of blasts is not fixed. The number of blasts per year varies depending on production needs, benching and pit development, and drilling equipment availability. The blasting operations are required to be conducted at a time and manner so that disturbance or distraction would be minimized by and to any sensitive receivers that would or could be proximate to the blasting area. Further, the mining operator is required to obtain blasting permit(s) from the State, and to notify Riverside County Sheriff's Department within 24 hours of planned blasting events.

Based on information provided by the Project Applicant, the maximum charge weight of blasts within the proposed mining areas would be 1,500 pounds. In addition, blasting within the Project boundaries would take place at a minimum of 50 feet from the mining limits, previously shown on Exhibit 8-A. This analysis, therefore, calculates the worst-case airblast and vibration levels using the closest receiver distance of 2,400 feet, plus the additional 50-foot off-set for blasting, which results in a worst-case distance of 2,450 feet from receiver location R3, as shown on Exhibit 9-A. The methodology used herein is provided in the International Society of Explosives Engineer's (ISEE's) *Blasters' Handbook*. (11) As previously discussed in Section 3.4, blasting operations are required to satisfy the maximum airblast and vibration levels identified by the USBM and OSMRE. For this analysis the lowest airblast limit of 129 dB (L) is used as a conservative threshold for airblast analysis. In addition, the vibration level limit of 0.75 in/sec PPV is used. Since the actual specifications of each blast will vary in maximum charge weight, location, and other parameters required to calculate the actual airblast and vibration levels experienced at nearby sensitive receiver locations, this noise study describes potential impacts based on the worst-case maximum charge weight of 1,500 pounds at the worst-case blasting location of 50 feet from the mining limits, as indicated by the Project Applicant and as shown on Exhibit 9-A.

At 2,450 feet from the worst-case blasting location closest to receiver location R3, as shown on Exhibit 9-A, airblasts are shown to approach 128 dB (L), and vibration levels will approach 0.10 in/sec PPV. Therefore, the worst-case airblast and vibration levels at the closest sensitive receiver location will satisfy the airblast and vibration level thresholds of 129 dB (L) and 0.75 in/sec PPV, respectively. Further, the worst-case airblast and vibration levels do not include any additional attenuation provided by the existing topography (e.g., hills and berms) between the Project operational noise sources and the nearby receiver locations, and therefore, likely overstate airblast and vibration levels generated by Project blasting activities. The airblast and vibration calculations per ISEE guidance are provided in Appendix 9.3. At greater distances to the remaining sensitive receiver locations the airblast and vibration levels would likely be further

reduced due to the additional attenuation provided by the added distance and intervening topography and earthen berms in the Project study area.

Therefore, since the worst-case airblast and vibration levels at the closest receiver location would remain below the airblast and vibration level thresholds, Project-related blasting impacts are considered *less than significant.* In addition, the mining operator is required to design all blasts such that they remain below the thresholds identified by the USBM and OSMRE at the time of Project blasting activities and must satisfy the permitting requirements of the State and Riverside County Sheriff's Department. Therefore, impacts related to Project blasting activities are considered *less than significant*.

9.7 MSHCP NOISE LEVELS

The Multiple Species Habitat Conservation Plan (MSHCP) adopted by the Western Riverside County Regional Conservation Authority (22) requires *that noise generating land uses affecting the MSHCP Conservation Area shall incorporate setbacks, berms or walls to minimize the effects of noise on MSHCP Conservation Area resources pursuant to applicable rules, regulations, and guidelines related to land use noise standards. For planning purposes, wildlife within the MSHCP Conservation Area should not be subject to noise that would exceed residential noise standards*. The Project land use include the following several noise generating activities: crushing and screening activities, loader activities and backup alarms, haul truck loading and pass-by events in combination with heavy equipment and dozer activity.

To minimize the effects of noise on the nearby MSCHP Conservation Areas, this analysis relies on the 65 dBA Leq exterior noise level standard used by the County of Riverside to assess impacts for noise sensitive residential land use. (14) To describe the potential Project noise levels within the nearby MSHCP Conservation Areas, several MSHCP noise receiver locations were identified for further analysis. As shown on Exhibit 9-B, twelve MSHCP receiver locations are used to describe the Project operational noise levels from the Project mining boundaries to the nearby conservation areas within MSHCP Cells 1687, 1688, 1784 and 1785. The noise level calculations describe the noise levels associated with the peak Project mining activities with operations at the limits of the project site boundary.

Table 9-6 presents a summary of the estimated MSHCP noise levels at each of the twelve noise receiver locations. As shown on Table 9-6, the Project-related noise levels are expected to range from 62.0 to 64.9 dBA L_{eq} with the construction of the recommended 12-foot high berm near receiver locations R4 and R5. The 12-foot high berm would extend for 765 feet. The analysis shows that the Project-related operational noise levels will satisfy the 65 dBA L_{eq} exterior noise level threshold identified for the proposed MSHCP Conservation Areas. Accordingly, the Project's noise impacts to the adjacent MSHCP Conservation Area would be *less than significant.*

EXHIBIT 9-B: MSHCP CONSERVATION AREA NOISE RECEIVER LOCATIONS

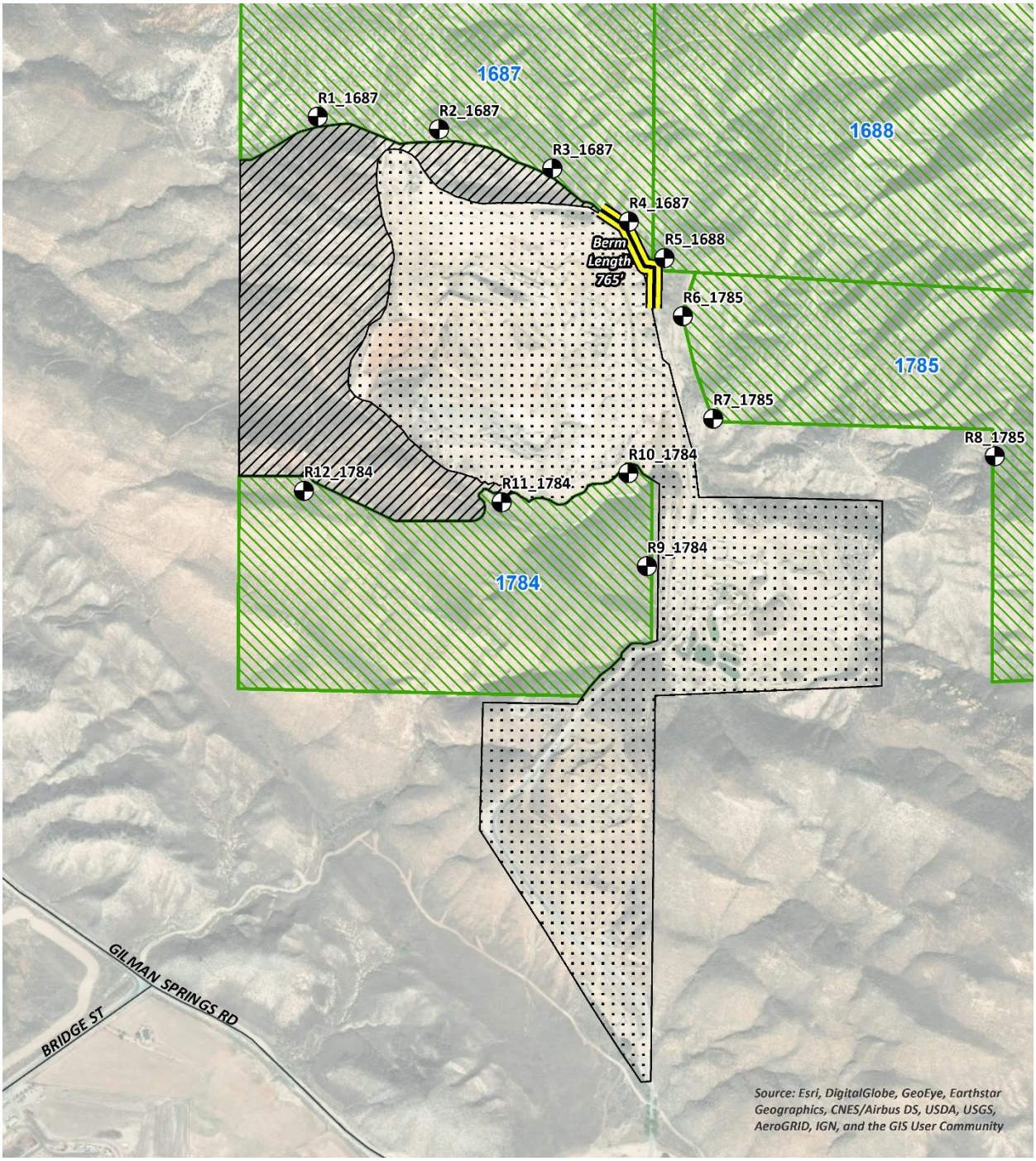


TABLE 9-6: MSHCP CONSERVATION AREA NOISE LEVEL COMPLIANCE

Receiver Location[1]	Noise Level at Receiver Locations (dBA L_{eq})[2]	Threshold[3]	Threshold Exceeded?[4]
R1_1687	60.7	65.0	No
R2_1687	52.4	65.0	No
R3_1687	51.5	65.0	No
R4_1687	53.7	65.0	No
R5_1688	60.8	65.0	No
R6_1785	51.8	65.0	No
R7_1785	42.0	65.0	No
R8_1785	27.8	65.0	No
R9_1784	57.1	65.0	No
R10_1784	58.4	65.0	No
R11_1784	62.4	65.0	No
R12_1784	58.3	65.0	No

[1] See Exhibit 9-B for the MSHCP Conservation Area cells, Project limits and receiver locations.
[2] Estimated exterior noise levels from peak Project mining operations with activity at the limits of the project site boundary.
[3] County of Riverside exterior noise threshold for noise sensitive residential land use.
[4] Do the estimated Project operational noise levels satisfy the noise level threshold?

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10 REFERENCES

1. **State of California.** *California Environmental Quality Act, Appendix G.* 2018.
2. **Urban Crossroads, Inc.** *Gilman Springs Mine Traffic Impact Analysis/Supplemental Traffic Assessment.* April 2018/March 2019.
3. **California Department of Transportation Environmental Program.** *Technical Noise Supplement - A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA : s.n., September 2013.
4. **Environmental Protection Agency Office of Noise Abatement and Control.** *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.* March 1974. EPA/ONAC 550/9/74-004.
5. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Noise and Air Quality Branch.** *Highway Traffic Noise Analysis and Abatement Policy and Guidance.* June, 1995.
6. **U.S. Department of Transportation, Federal Highway Administration.** *Highway Traffic Noise in the United States, Problem and Response.* April 2000. p. 3.
7. **U.S. Environmental Protection Agency Office of Noise Abatement and Control.** *Noise Effects Handbook-A Desk Reference to Health and Welfare Effects of Noise.* October 1979 (revised July 1981). EPA 550/9/82/106.
8. **Occupational Safety and Health Administration.** *Standard 29 CRF, Part 1910.*
9. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment.* September 2018.
10. **California Department of Transportation.** *Transportation and Construction Vibration Guidance Manual.* September 2019.
11. **International Society of Explosives Engineer's.** *Blasters' Handbook, 18th Edition.* 2014.
12. **Office of Planning and Research.** *State of California General Plan Guidlines.* October 2017.
13. **County of Riverside.** *General Plan Noise Element.* December 2015.
14. **County of Riverside, Office of Industrial Hygiene.** *Requirements for Determining and Mitigating Traffic Noise Impacts to Residential Structures.* April 2015.
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16. **California Court of Appeal.** *Gray v. County of Madera, F053661.* 167 Cal.App.4th 1099; - Cal.Rptr.3d, October 2008.
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19. **U.S. Department of Transportation, Federal Highway Administration.** *FHWA Highway Traffic Noise Prediction Model.* December 1978. FHWA-RD-77-108.
20. **California Department of Transportation Environmental Program, Office of Environmental Engineering.** *Use of California Vehicle Noise Reference Energy Mean Emission Levels (Calveno REMELs) in FHWA Highway Traffic Noise Prediction.* September 1995. TAN 95-03.

21. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.

22. **Western Riverside County Regional Conservation Authority.** *Western Riverside County Multiple Species Habitat Conservation Plan.* August 2007.

23. **City of Lake Elsinore.** *LEAP 2018-02/Lake Street Storage Project MSHCP Consistency Findings.* November 2018.

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11 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Gilman Springs Mine Project. The information contained in this noise study report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 336-5979.

Bill Lawson, P.E., INCE
Principal
URBAN CROSSROADS, INC.
260 E. Baker Street, Suite 200
Costa Mesa, CA 92626
(949) 336-5979
blawson@urbanxroads.com

EDUCATION

Master of Science in Civil and Environmental Engineering
California Polytechnic State University, San Luis Obispo • December, 1993

Bachelor of Science in City and Regional Planning
California Polytechnic State University, San Luis Obispo • June, 1992

PROFESSIONAL REGISTRATIONS

PE – Registered Professional Traffic Engineer – TR 2537 • January, 2009
AICP – American Institute of Certified Planners – 013011 • June, 1997–January 1, 2012
PTP – Professional Transportation Planner • May, 2007 – May, 2013
INCE – Institute of Noise Control Engineering • March, 2004

PROFESSIONAL AFFILIATIONS

ASA – Acoustical Society of America
ITE – Institute of Transportation Engineers

PROFESSIONAL CERTIFICATIONS

Certified Acoustical Consultant – County of Orange • February, 2011
FHWA-NHI-142051 Highway Traffic Noise Certificate of Training • February, 2013

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APPENDIX 5.1:

STUDY AREA PHOTOS

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L1_E
33, 53' 22.830000", 117, 4' 14.060000"

L1_N
33, 53' 22.900000", 117, 4' 14.090000"

L1_S
33, 53' 22.900000", 117, 4' 14.090000"

L1_W
33, 53' 22.900000", 117, 4' 14.090000"

L2_E
33, 52' 9.180000", 117, 2' 42.300000"

L2_N
33, 52' 9.210000", 117, 2' 42.210000"

L2_S
33, 52' 9.180000", 117, 2' 42.300000"

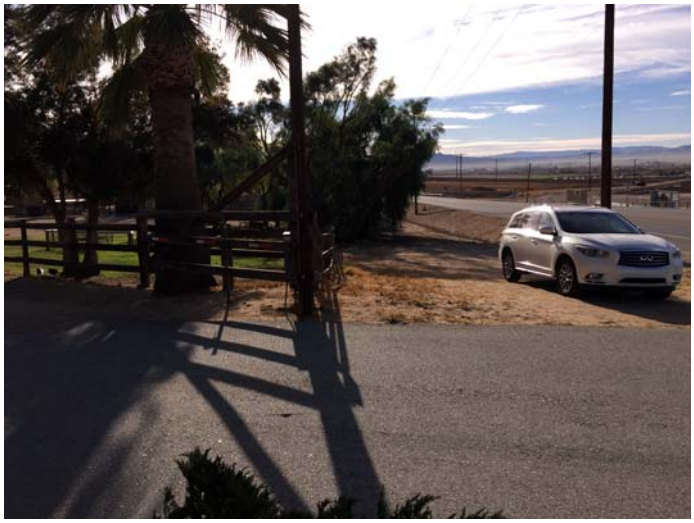
L2_W
33, 52' 9.140000", 117, 2' 42.080000"

L3_E
33, 52' 1.380000", 117, 2' 1.540000"

L3_N
33, 52' 1.340000", 117, 2' 1.620000"

L3_S
33, 52' 1.340000", 117, 2' 1.620000"

L3_W
33, 52' 1.340000", 117, 2' 1.620000"



L4_E
33, 51' 23.160000", 117, 1' 5.670000"

L4_N
33, 51' 23.150000", 117, 1' 5.590000"

L4_S
33, 51' 23.160000", 117, 1' 5.670000"

L4_W
33, 51' 23.150000", 117, 1' 5.590000"

L5_E
33, 51' 3.690000", 117, 4' 37.490000"

L5_N
33, 51' 3.810000", 117, 4' 37.430000"

L5_S
33, 51' 3.520000", 117, 4' 37.460000"

L5_W
33, 51' 3.810000", 117, 4' 37.430000"

L6_E
33, 50' 24.630000", 117, 4' 8.950000"

L6_N
33, 50' 24.180000", 117, 4' 9.500000"

L6_S
33, 50' 24.630000", 117, 4' 8.950000"

L6_W
33, 50' 24.540000", 117, 4' 9.060000"

APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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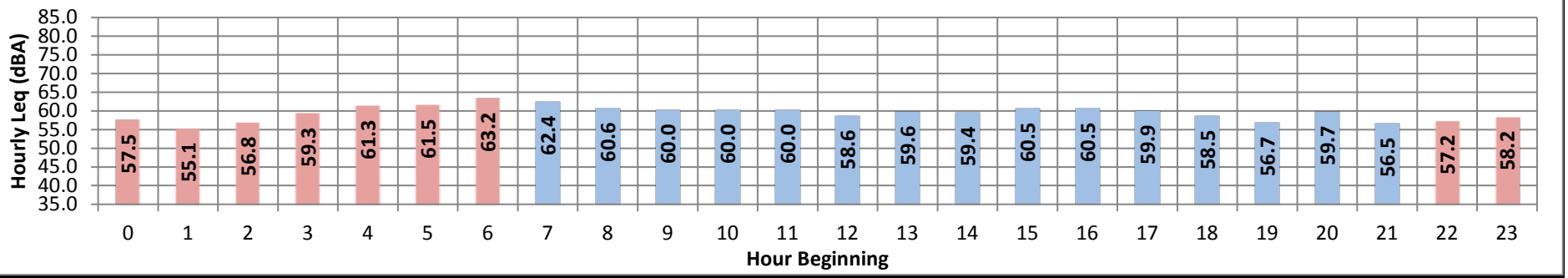
24-Hour Noise Level Measurement Summary

			Energy Average Leq		24-Hour
Project Name: Gilman Mine	*JN:* 11381		*Day*	*Night*	*CNEL*
Location: L1 - Located northwest of the Project site on Gilman Springs Road near existing vacant land and agricultural uses.	*Analyst:* A. Wolfe		59.8	59.6	66.2
	Date: 12/12/2017				

Hourly Leq dBA Readings (unadjusted)



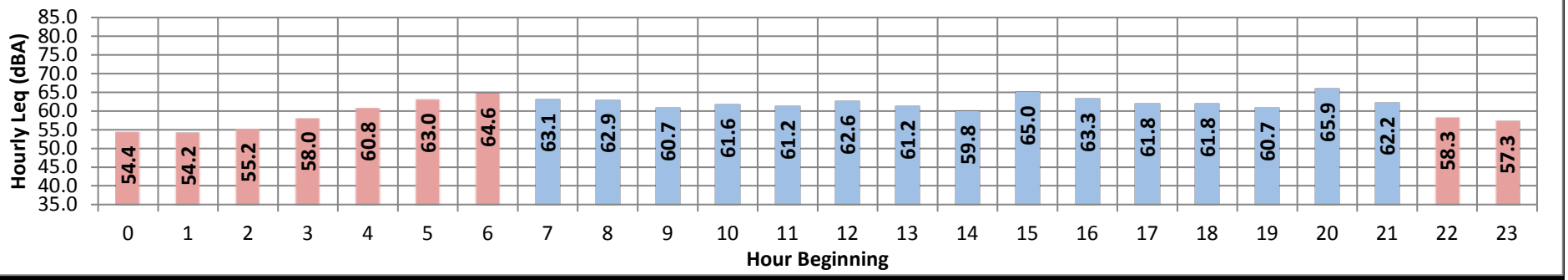
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	56.5	71.7	35.1	65.0	63.0	61.0	60.0	56.0	52.0	41.0	39.0	35.0
	Max	62.4	86.3	44.1	71.0	69.0	66.0	65.0	62.0	59.0	52.0	50.0	47.0
Energy Average:		59.8	Average:		68.7	66.6	64.0	62.6	58.7	55.6	46.7	44.5	41.3
Night	Min	55.1	75.8	35.1	66.0	64.0	60.0	58.0	52.0	46.0	38.0	35.0	35.0
	Max	63.2	83.3	45.7	71.0	70.0	68.0	66.0	63.0	61.0	54.0	51.0	49.0
Energy Average:		59.6	Average:		68.7	66.7	63.4	61.7	57.4	52.6	43.8	41.9	39.7
Hourly Summary													
Night	0	57.5	83.3	35.1	67.0	65.0	60.0	58.0	53.0	47.0	38.0	37.0	35.0
	1	55.1	76.8	35.1	66.0	64.0	60.0	58.0	52.0	46.0	38.0	38.0	35.0
	2	56.8	80.4	35.1	68.0	65.0	61.0	59.0	54.0	47.0	38.0	35.0	35.0
	3	59.3	76.5	35.1	69.0	67.0	64.0	63.0	59.0	54.0	43.0	41.0	38.0
	4	61.3	77.0	39.8	70.0	69.0	67.0	65.0	61.0	57.0	49.0	47.0	42.0
	5	61.5	79.7	44.6	70.0	68.0	66.0	65.0	62.0	58.0	51.0	49.0	47.0
	6	63.2	78.2	45.7	71.0	70.0	68.0	66.0	63.0	61.0	54.0	51.0	49.0
Day	7	62.4	81.7	44.1	71.0	69.0	66.0	65.0	62.0	59.0	52.0	50.0	47.0
	8	60.6	81.8	41.0	70.0	68.0	65.0	64.0	60.0	57.0	49.0	47.0	44.0
	9	60.0	79.3	38.0	69.0	67.0	65.0	64.0	59.0	56.0	45.0	43.0	39.0
	10	60.0	78.2	35.1	70.0	68.0	65.0	63.0	59.0	55.0	43.0	41.0	38.0
	11	60.0	78.4	35.1	70.0	68.0	65.0	63.0	59.0	55.0	44.0	41.0	38.0
	12	58.6	73.4	35.1	68.0	66.0	64.0	62.0	58.0	55.0	45.0	42.0	38.0
	13	59.6	74.3	37.9	69.0	67.0	65.0	64.0	59.0	56.0	47.0	45.0	41.0
	14	59.4	75.4	37.5	68.0	67.0	64.0	63.0	59.0	56.0	48.0	46.0	43.0
	15	60.5	77.8	43.0	69.0	67.0	65.0	64.0	60.0	57.0	52.0	49.0	46.0
	16	60.5	80.7	41.1	69.0	67.0	65.0	63.0	60.0	57.0	52.0	49.0	46.0
	17	59.9	78.5	42.3	69.0	67.0	64.0	63.0	59.0	57.0	51.0	49.0	46.0
	18	58.5	78.6	40.9	67.0	65.0	63.0	61.0	58.0	55.0	47.0	45.0	43.0
	19	56.7	74.7	38.1	65.0	63.0	61.0	60.0	57.0	54.0	44.0	42.0	39.0
	20	59.7	86.3	35.1	70.0	66.0	62.0	60.0	56.0	53.0	41.0	39.0	35.0
	21	56.5	71.7	35.1	66.0	64.0	61.0	60.0	56.0	52.0	41.0	39.0	37.0
Night	22	57.2	75.8	35.1	68.0	65.0	62.0	60.0	56.0	51.0	42.0	40.0	38.0
	23	58.2	78.3	35.1	69.0	67.0	63.0	61.0	57.0	52.0	41.0	39.0	38.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

					Energy Average Leq		24-Hour
Project Name:	Gilman Mine	*JN:*	11381		*Day*	*Night*	*CNEL*
Location:	L2 - Located southwest of the Project site on Bridge Street near existing agricultural use.	*Analyst:*	A. Wolfe		62.6	59.9	67.3
		Date:	12/12/2017				

Hourly Leq dBA Readings (unadjusted)



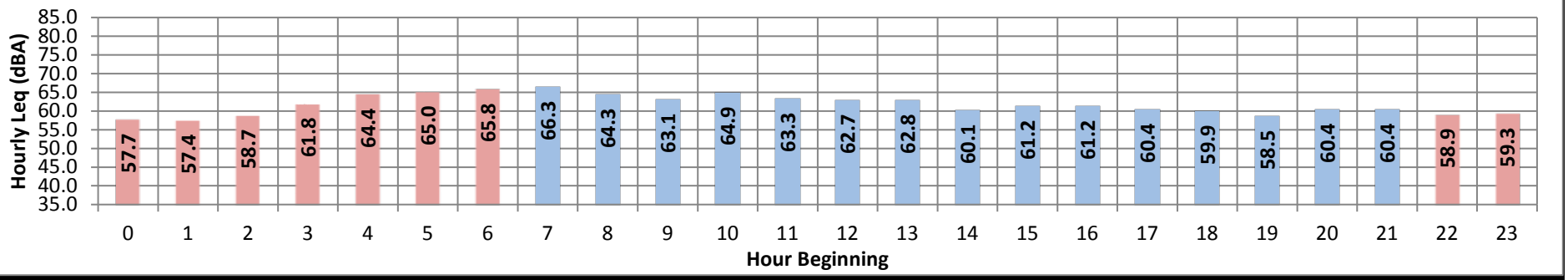
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	59.8	79.4	34.8	71.0	69.0	65.0	61.0	52.0	47.0	41.0	39.0	37.0
	Max	65.9	96.0	45.6	76.0	73.0	69.0	67.0	60.0	56.0	52.0	50.0	48.0
Energy Average:		62.6	Average:		73.8	71.1	67.2	64.4	55.7	51.1	44.8	42.9	40.3
Night	Min	54.2	77.1	34.8	65.0	60.0	57.0	55.0	50.0	46.0	37.0	35.0	35.0
	Max	64.6	87.9	49.6	75.0	73.0	70.0	68.0	62.0	58.0	54.0	53.0	51.0
Energy Average:		59.9	Average:		69.6	66.2	61.8	59.7	54.4	50.7	43.3	41.3	39.3
Hourly Summary													
Night	0	54.4	79.1	34.8	66.0	60.0	57.0	55.0	50.0	46.0	37.0	35.0	35.0
	1	54.2	77.1	34.8	66.0	62.0	57.0	55.0	50.0	46.0	37.0	35.0	35.0
	2	55.2	79.0	34.8	65.0	61.0	58.0	57.0	52.0	47.0	38.0	36.0	35.0
	3	58.0	79.8	37.8	69.0	66.0	61.0	60.0	56.0	52.0	46.0	44.0	40.0
	4	60.8	81.1	39.0	73.0	70.0	65.0	62.0	57.0	54.0	49.0	47.0	43.0
	5	63.0	87.9	43.0	74.0	72.0	67.0	64.0	58.0	55.0	49.0	48.0	45.0
	6	64.6	83.9	49.6	75.0	73.0	70.0	68.0	62.0	58.0	54.0	53.0	51.0
Day	7	63.1	86.3	45.6	73.0	71.0	69.0	67.0	60.0	56.0	52.0	50.0	48.0
	8	62.9	87.4	40.5	76.0	73.0	68.0	65.0	56.0	51.0	46.0	44.0	42.0
	9	60.7	80.1	39.4	74.0	71.0	67.0	64.0	53.0	48.0	42.0	41.0	40.0
	10	61.6	85.7	37.8	73.0	70.0	66.0	64.0	53.0	48.0	41.0	40.0	39.0
	11	61.2	86.1	37.8	73.0	70.0	65.0	62.0	52.0	47.0	41.0	39.0	37.0
	12	62.6	86.7	37.5	75.0	72.0	68.0	65.0	54.0	48.0	41.0	39.0	37.0
	13	61.2	81.7	37.8	74.0	71.0	67.0	64.0	55.0	51.0	44.0	42.0	39.0
	14	59.8	79.4	37.8	71.0	69.0	66.0	64.0	56.0	52.0	45.0	43.0	40.0
	15	65.0	90.1	39.5	76.0	73.0	69.0	67.0	59.0	54.0	49.0	47.0	43.0
	16	63.3	84.0	39.1	74.0	72.0	69.0	67.0	60.0	54.0	49.0	47.0	42.0
	17	61.8	82.5	39.9	73.0	71.0	68.0	66.0	57.0	53.0	48.0	46.0	42.0
	18	61.8	83.2	37.8	73.0	71.0	68.0	65.0	57.0	53.0	47.0	45.0	41.0
	19	60.7	85.3	35.3	72.0	70.0	66.0	62.0	54.0	51.0	43.0	41.0	39.0
	20	65.9	96.0	34.8	76.0	72.0	66.0	61.0	54.0	50.0	41.0	39.0	37.0
	21	62.2	86.6	37.8	74.0	71.0	66.0	63.0	55.0	51.0	43.0	41.0	38.0
Night	22	58.3	85.3	34.8	69.0	66.0	60.0	58.0	53.0	49.0	40.0	37.0	35.0
	23	57.3	81.2	34.8	69.0	66.0	61.0	58.0	52.0	49.0	40.0	37.0	35.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

Project Name:	Gilman Mine	*JN:*	11381	*Energy Average Leq*	*24-Hour*
Location:	L3 - Located south of the Project site on Gilman Springs Road adjacent to the entrance gate for the Project.	*Analyst:*	A. Wolfe	*Day* / *Night*	*CNEL*
		Date:	12/12/2017	62.5 / 62.1	68.8

Hourly Leq dBA Readings (unadjusted)



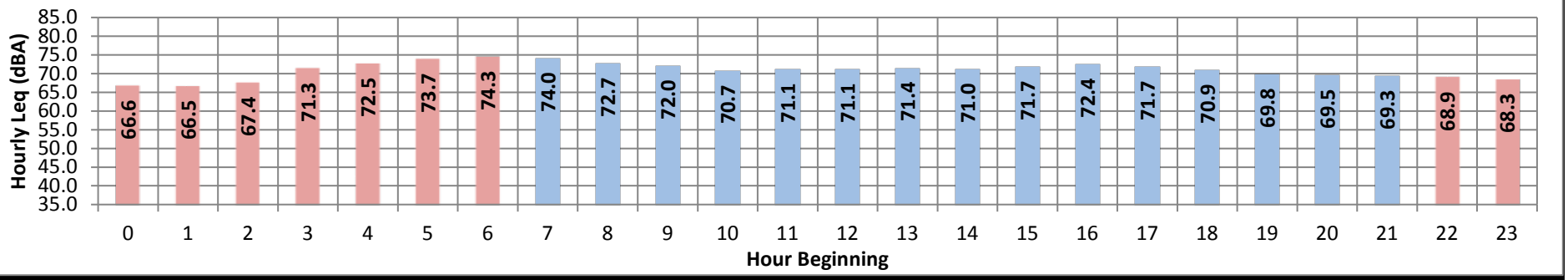
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	58.5	71.7	36.5	65.0	64.0	62.0	62.0	59.0	57.0	45.0	41.0	36.0
	Max	66.3	88.4	43.3	75.0	72.0	70.0	69.0	66.0	64.0	57.0	54.0	48.0
Energy Average:		62.5	Average:		69.9	68.2	65.9	64.8	61.9	59.3	51.0	47.5	41.7
Night	Min	57.4	71.9	36.5	66.0	65.0	63.0	61.0	58.0	51.0	36.0	36.0	36.0
	Max	65.8	81.1	43.4	73.0	72.0	69.0	68.0	66.0	64.0	58.0	55.0	47.0
Energy Average:		62.1	Average:		69.2	67.7	65.7	64.7	61.4	56.9	44.1	42.2	39.3
Hourly Summary													
Night	0	57.7	75.0	36.5	66.0	65.0	63.0	62.0	58.0	52.0	36.0	36.0	36.0
	1	57.4	75.2	36.5	67.0	65.0	63.0	61.0	58.0	51.0	36.0	36.0	36.0
	2	58.7	77.6	36.5	68.0	66.0	64.0	63.0	59.0	53.0	36.0	36.0	36.0
	3	61.8	77.3	36.5	70.0	68.0	67.0	66.0	62.0	58.0	44.0	41.0	36.0
	4	64.4	78.9	41.2	71.0	70.0	68.0	68.0	65.0	62.0	53.0	50.0	44.0
	5	65.0	80.0	41.3	72.0	71.0	69.0	68.0	66.0	63.0	55.0	52.0	47.0
	6	65.8	81.1	43.4	73.0	72.0	69.0	68.0	66.0	64.0	58.0	55.0	47.0
Day	7	66.3	82.8	41.3	75.0	72.0	70.0	69.0	66.0	64.0	57.0	54.0	48.0
	8	64.3	83.1	42.0	74.0	72.0	68.0	67.0	64.0	61.0	53.0	49.0	44.0
	9	63.1	77.5	40.9	72.0	70.0	68.0	66.0	63.0	60.0	53.0	50.0	45.0
	10	64.9	88.4	36.5	74.0	72.0	68.0	66.0	63.0	60.0	52.0	48.0	42.0
	11	63.3	79.8	36.5	73.0	71.0	68.0	66.0	63.0	60.0	52.0	49.0	42.0
	12	62.7	83.2	36.5	70.0	69.0	67.0	66.0	63.0	60.0	52.0	48.0	41.0
	13	62.8	85.2	36.5	71.0	69.0	66.0	65.0	62.0	59.0	51.0	47.0	37.0
	14	60.1	73.5	39.5	69.0	67.0	64.0	63.0	60.0	58.0	49.0	45.0	41.0
	15	61.2	81.8	41.0	69.0	67.0	65.0	64.0	61.0	59.0	52.0	49.0	45.0
	16	61.2	79.3	43.3	68.0	67.0	65.0	64.0	61.0	59.0	54.0	51.0	47.0
	17	60.4	76.2	37.1	67.0	65.0	64.0	63.0	61.0	59.0	52.0	48.0	40.0
	18	59.9	74.8	36.5	67.0	66.0	64.0	63.0	60.0	58.0	50.0	48.0	42.0
	19	58.5	74.3	36.5	65.0	64.0	62.0	62.0	59.0	57.0	46.0	43.0	39.0
	20	60.4	75.5	36.5	67.0	66.0	65.0	64.0	62.0	58.0	45.0	41.0	36.0
	21	60.4	71.7	36.5	67.0	66.0	64.0	64.0	61.0	58.0	47.0	43.0	36.0
Night	22	58.9	71.9	36.5	67.0	65.0	64.0	63.0	60.0	55.0	41.0	38.0	36.0
	23	59.3	74.9	36.5	69.0	67.0	64.0	63.0	59.0	54.0	38.0	36.0	36.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

Project Name:	Gilman Mine	*JN:*	11381	*Energy Average Leq*		*24-Hour*
Location:	L4 - Located south of the Project site on Gilman Springs Road near existing agricultural uses and the Victory Ranch Baptist Camp west of State Route 79.	*Analyst:*	A. Wolfe	*Day*	*Night*	*CNEL*
		Date:	12/12/2017	71.5	70.9	77.6

Hourly Leq dBA Readings (unadjusted)



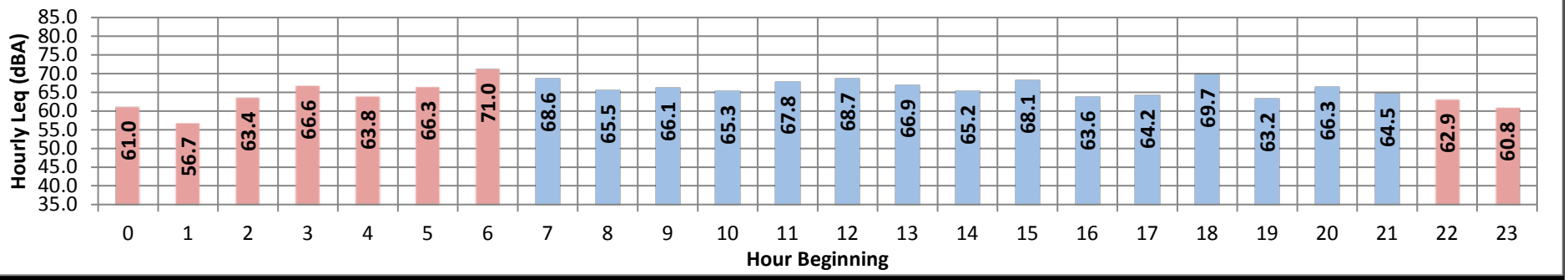
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	69.3	84.2	39.9	77.0	76.0	74.0	73.0	70.0	64.0	47.0	45.0	42.0
	Max	74.0	95.2	48.6	82.0	80.0	78.0	77.0	75.0	72.0	58.0	54.0	50.0
Energy Average:		71.5	Average:		79.3	77.8	75.5	74.6	71.9	68.2	52.2	49.5	46.7
Night	Min	66.5	84.0	43.2	77.0	75.0	73.0	71.0	62.0	51.0	45.0	45.0	44.0
	Max	74.3	92.0	48.9	82.0	80.0	78.0	77.0	75.0	72.0	59.0	55.0	51.0
Energy Average:		70.9	Average:		79.4	77.4	75.2	74.1	69.0	60.9	50.2	48.7	46.7
Hourly Summary													
Night	0	66.6	84.0	44.2	77.0	75.0	73.0	72.0	64.0	53.0	46.0	45.0	44.0
	1	66.5	86.2	43.2	78.0	76.0	73.0	71.0	62.0	51.0	45.0	45.0	44.0
	2	67.4	91.4	44.4	78.0	76.0	73.0	72.0	64.0	55.0	47.0	46.0	45.0
	3	71.3	91.6	44.3	81.0	79.0	76.0	75.0	71.0	62.0	49.0	48.0	46.0
	4	72.5	87.9	47.2	81.0	79.0	77.0	76.0	73.0	68.0	55.0	53.0	50.0
	5	73.7	92.0	48.3	81.0	80.0	78.0	77.0	75.0	71.0	57.0	54.0	50.0
	6	74.3	91.7	48.9	82.0	80.0	78.0	77.0	75.0	72.0	59.0	55.0	51.0
Day	7	74.0	87.1	47.9	82.0	80.0	78.0	77.0	75.0	72.0	58.0	54.0	50.0
	8	72.7	92.6	46.7	82.0	80.0	77.0	76.0	73.0	69.0	54.0	52.0	49.0
	9	72.0	95.2	45.7	80.0	79.0	76.0	75.0	72.0	68.0	51.0	48.0	47.0
	10	70.7	87.4	45.3	79.0	78.0	75.0	74.0	71.0	67.0	50.0	49.0	46.0
	11	71.1	90.6	44.8	80.0	78.0	76.0	74.0	71.0	67.0	49.0	48.0	46.0
	12	71.1	85.6	43.4	80.0	78.0	76.0	75.0	72.0	68.0	51.0	47.0	45.0
	13	71.4	91.7	45.1	79.0	78.0	76.0	75.0	72.0	69.0	52.0	49.0	47.0
	14	71.0	85.4	44.8	79.0	78.0	75.0	74.0	72.0	68.0	53.0	49.0	46.0
	15	71.7	88.2	47.0	79.0	78.0	76.0	75.0	72.0	70.0	55.0	52.0	49.0
	16	72.4	88.0	48.6	80.0	78.0	76.0	75.0	73.0	71.0	57.0	54.0	50.0
	17	71.7	92.3	47.4	79.0	77.0	75.0	74.0	72.0	70.0	55.0	52.0	50.0
	18	70.9	88.1	46.6	78.0	77.0	75.0	74.0	72.0	69.0	55.0	51.0	48.0
	19	69.8	84.2	41.4	77.0	76.0	74.0	74.0	71.0	67.0	48.0	46.0	42.0
	20	69.5	86.9	39.9	78.0	76.0	74.0	74.0	71.0	64.0	47.0	45.0	42.0
	21	69.3	85.1	41.3	77.0	76.0	74.0	73.0	70.0	64.0	48.0	46.0	44.0
Night	22	68.9	84.8	44.9	79.0	76.0	75.0	74.0	69.0	59.0	47.0	46.0	45.0
	23	68.3	86.6	45.1	78.0	76.0	74.0	73.0	68.0	57.0	47.0	46.0	45.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

				Energy Average Leq		24-Hour
Project Name:	Gilman Mine	*JN:*	11381	*Day*	*Night*	*CNEL*
Location:	L5 - Located southwest of the Project site adjacent to existing agricultural uses on Main Street.	*Analyst:*	A. Wolfe	66.7	65.4	72.2
		Date:	12/12/2017			

Hourly Leq dBA Readings (unadjusted)



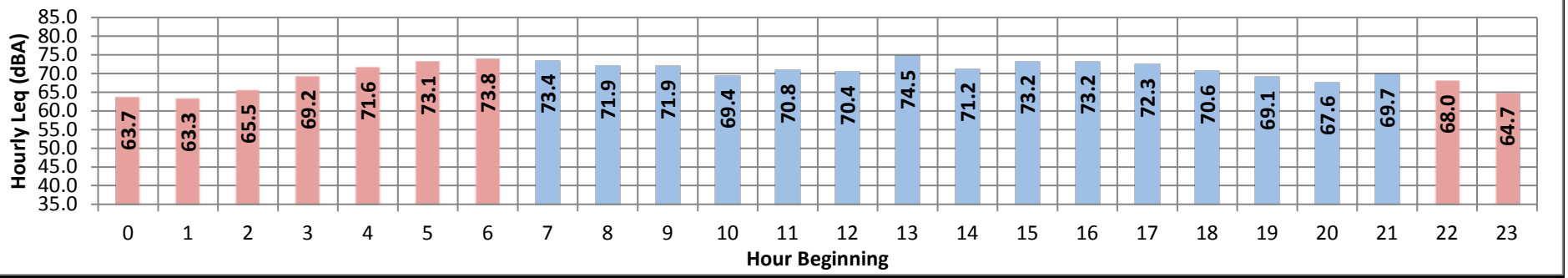
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	63.2	92.1	47.5	70.0	66.0	62.0	60.0	55.0	54.0	52.0	51.0	50.0
	Max	69.7	98.2	57.3	80.0	75.0	71.0	69.0	65.0	63.0	61.0	60.0	59.0
Energy Average:		66.7	Average:		74.7	70.5	65.8	63.9	60.4	58.8	56.3	55.5	54.5
Night	Min	56.7	65.6	50.2	60.0	60.0	59.0	58.0	57.0	56.0	54.0	53.0	53.0
	Max	71.0	96.3	55.3	83.0	78.0	71.0	69.0	65.0	63.0	60.0	59.0	58.0
Energy Average:		65.4	Average:		70.2	66.9	63.7	62.2	60.2	58.7	56.1	55.7	54.8
Hourly Summary													
Night	0	61.0	92.2	50.2	64.0	62.0	60.0	59.0	58.0	56.0	54.0	54.0	53.0
	1	56.7	65.6	50.6	60.0	60.0	59.0	58.0	57.0	56.0	54.0	53.0	53.0
	2	63.4	93.4	50.8	70.0	65.0	61.0	60.0	58.0	57.0	54.0	54.0	53.0
	3	66.6	96.3	51.9	74.0	70.0	65.0	63.0	61.0	59.0	56.0	56.0	55.0
	4	63.8	93.2	53.3	70.0	67.0	65.0	64.0	62.0	60.0	57.0	57.0	56.0
	5	66.3	92.6	55.0	76.0	70.0	66.0	64.0	62.0	61.0	59.0	58.0	57.0
	6	71.0	96.3	55.3	83.0	78.0	71.0	69.0	65.0	63.0	60.0	59.0	58.0
Day	7	68.6	96.5	57.3	77.0	74.0	71.0	69.0	65.0	63.0	61.0	60.0	59.0
	8	65.5	92.1	57.2	72.0	70.0	67.0	66.0	64.0	63.0	61.0	60.0	59.0
	9	66.1	92.5	56.2	75.0	71.0	66.0	65.0	63.0	62.0	60.0	59.0	59.0
	10	65.3	94.6	55.2	73.0	69.0	65.0	64.0	61.0	60.0	58.0	58.0	57.0
	11	67.8	96.9	54.6	76.0	72.0	66.0	64.0	61.0	60.0	58.0	58.0	57.0
	12	68.7	98.2	51.7	79.0	74.0	68.0	65.0	61.0	59.0	57.0	56.0	55.0
	13	66.9	94.4	49.9	77.0	71.0	66.0	63.0	60.0	58.0	55.0	54.0	53.0
	14	65.2	95.8	50.5	73.0	69.0	65.0	63.0	60.0	58.0	56.0	55.0	53.0
	15	68.1	94.9	54.1	76.0	72.0	67.0	65.0	62.0	61.0	58.0	58.0	57.0
	16	63.6	93.6	50.8	70.0	66.0	64.0	63.0	62.0	60.0	55.0	54.0	53.0
	17	64.2	93.1	49.3	73.0	70.0	65.0	62.0	57.0	55.0	53.0	52.0	51.0
	18	69.7	98.1	49.3	80.0	75.0	68.0	65.0	59.0	56.0	53.0	53.0	52.0
	19	63.2	92.4	48.2	70.0	66.0	62.0	60.0	55.0	54.0	52.0	51.0	50.0
	20	66.3	97.1	47.5	74.0	70.0	64.0	62.0	57.0	56.0	53.0	51.0	50.0
	21	64.5	96.4	51.0	75.0	69.0	63.0	62.0	59.0	57.0	55.0	54.0	53.0
Night	22	62.9	90.7	51.6	70.0	68.0	65.0	63.0	60.0	58.0	55.0	55.0	54.0
	23	60.8	91.1	51.9	65.0	62.0	61.0	60.0	59.0	58.0	56.0	55.0	54.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

Project Name: Gilman Mine		*JN:* 11381	*Energy Average Leq*		*24-Hour*
		Analyst: A. Wolfe	*Day*	*Night*	*CNEL*
Location: L6 - Located southwest of the Project site near existing agricultural uses on Bridge Street.		*Date:* 12/12/2017	71.7	69.7	76.7

Hourly Leq dBA Readings (unadjusted)



Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	67.6	85.1	38.9	77.0	75.0	73.0	72.0	67.0	61.0	49.0	47.0	42.0
	Max	74.5	102.2	53.4	83.0	81.0	78.0	77.0	73.0	70.0	61.0	58.0	55.0
Energy Average:		71.7	Average:		80.6	78.6	75.7	74.3	70.3	65.4	54.3	51.7	47.7
Night	Min	63.3	81.2	38.9	75.0	73.0	70.0	68.0	59.0	52.0	43.0	42.0	41.0
	Max	73.8	96.2	54.3	82.0	80.0	78.0	77.0	74.0	71.0	61.0	59.0	56.0
Energy Average:		69.7	Average:		78.1	76.2	73.8	72.0	66.3	60.0	50.0	48.2	45.4
Hourly Summary													
Night	0	63.7	83.8	40.7	75.0	73.0	70.0	68.0	59.0	52.0	44.0	42.0	41.0
	1	63.3	81.2	40.7	75.0	73.0	70.0	68.0	60.0	53.0	43.0	43.0	41.0
	2	65.5	85.4	40.7	77.0	75.0	72.0	70.0	61.0	53.0	44.0	43.0	42.0
	3	69.2	90.5	43.0	79.0	77.0	75.0	73.0	68.0	60.0	50.0	47.0	45.0
	4	71.6	92.8	45.4	81.0	79.0	77.0	75.0	72.0	66.0	54.0	52.0	47.0
	5	73.1	96.2	50.9	81.0	80.0	77.0	76.0	73.0	69.0	58.0	56.0	53.0
	6	73.8	94.7	54.3	82.0	80.0	78.0	77.0	74.0	71.0	61.0	59.0	56.0
Day	7	73.4	94.3	53.4	82.0	81.0	78.0	77.0	73.0	69.0	59.0	58.0	55.0
	8	71.9	89.2	46.7	82.0	80.0	77.0	75.0	71.0	66.0	55.0	53.0	49.0
	9	71.9	99.3	45.8	81.0	79.0	75.0	74.0	69.0	63.0	51.0	49.0	47.0
	10	69.4	89.8	43.6	79.0	77.0	75.0	73.0	68.0	62.0	50.0	48.0	45.0
	11	70.8	95.8	41.8	81.0	79.0	75.0	73.0	69.0	63.0	49.0	47.0	45.0
	12	70.4	93.2	42.9	80.0	78.0	75.0	74.0	70.0	64.0	50.0	47.0	44.0
	13	74.5	102.2	43.9	83.0	80.0	77.0	75.0	71.0	67.0	53.0	50.0	46.0
	14	71.2	88.3	44.4	81.0	79.0	76.0	75.0	71.0	66.0	56.0	54.0	49.0
	15	73.2	97.8	49.0	81.0	80.0	77.0	76.0	73.0	68.0	60.0	57.0	54.0
	16	73.2	89.0	45.5	83.0	81.0	78.0	76.0	73.0	70.0	61.0	58.0	52.0
	17	72.3	89.4	47.9	81.0	79.0	77.0	76.0	73.0	69.0	60.0	56.0	51.0
	18	70.6	85.5	40.6	80.0	78.0	75.0	74.0	71.0	67.0	56.0	52.0	45.0
	19	69.1	87.5	38.9	78.0	76.0	74.0	73.0	69.0	64.0	51.0	48.0	42.0
	20	67.6	85.1	39.0	77.0	75.0	73.0	72.0	67.0	61.0	51.0	49.0	45.0
	21	69.7	95.6	44.9	80.0	77.0	73.0	72.0	67.0	62.0	52.0	50.0	47.0
Night	22	68.0	89.3	41.9	78.0	76.0	74.0	72.0	66.0	60.0	49.0	47.0	43.0
	23	64.7	83.7	38.9	75.0	73.0	71.0	69.0	64.0	56.0	47.0	45.0	41.0

URBAN CROSSROADS

APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE LEVEL CONTOURS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Gilman Mine
Road Name: Gilman Springs Rd. | Job Number: 11381
Road Segment: s/o SR-60

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,989 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,499 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	90.41%
Medium Trucks:	64.8%	8.5%	26.7%	7.53%
Heavy Trucks:	72.5%	4.7%	22.8%	2.06%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	41.037
Medium Trucks:	40.820
Heavy Trucks:	40.841

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	0.83	1.18	-1.20	-4.65	0.000	0.000
Medium Trucks:	82.40	-9.96	1.22	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-15.59	1.21	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.6	70.1	68.6	66.3	73.4	73.8
Medium Trucks:	72.5	69.8	67.0	67.2	74.0	74.2
Heavy Trucks:	70.8	68.6	62.8	64.8	71.9	72.0
Vehicle Noise:	76.8	74.3	71.5	71.0	77.9	78.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	169	365	786	1,693
CNEL:	176	379	817	1,761

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Gilman Mine
Road Name: Gilman Springs Rd. | Job Number: 11381
Road Segment: s/o Allesandro Bl.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,420 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,942 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	90.41%
Medium Trucks:	64.8%	8.5%	26.7%	7.53%
Heavy Trucks:	72.5%	4.7%	22.8%	2.06%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	41.037
Medium Trucks:	40.820
Heavy Trucks:	40.841

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.54	1.18	-1.20	-4.65	0.000	0.000
Medium Trucks:	82.40	-9.26	1.22	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-14.89	1.21	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	73.3	70.8	69.3	67.0	74.1	74.5
Medium Trucks:	73.2	70.5	67.7	67.9	74.7	74.9
Heavy Trucks:	71.5	69.3	63.5	65.6	72.6	72.7
Vehicle Noise:	77.5	75.0	72.2	71.7	78.7	78.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	189	407	876	1,887
CNEL:	196	423	911	1,964

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Gilman Mine
Road Name: Gilman Springs Rd. | Job Number: 11381
Road Segment: s/o Jack Rabbit Tr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,402 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,940 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	90.41%
Medium Trucks:	64.8%	8.5%	26.7%	7.53%
Heavy Trucks:	72.5%	4.7%	22.8%	2.06%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.54	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-9.26	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.89	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.1	68.6	67.1	64.8	72.0	72.3
Medium Trucks:	71.0	68.3	65.5	65.7	72.5	72.7
Heavy Trucks:	69.3	67.2	61.3	63.4	70.4	70.5
Vehicle Noise:	75.3	72.8	70.0	69.5	76.5	76.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	173	372	802	1,728
CNEL:	180	387	834	1,797

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Gilman Mine
Road Name: Gilman Springs Rd. | Job Number: 11381
Road Segment: s/o Bridge St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,484 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,548 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	90.41%
Medium Trucks:	64.8%	8.5%	26.7%	7.53%
Heavy Trucks:	72.5%	4.7%	22.8%	2.06%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	0.92	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-9.88	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-15.51	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.5	68.0	66.5	64.2	71.3	71.7
Medium Trucks:	70.4	67.7	64.9	65.1	71.9	72.1
Heavy Trucks:	68.7	66.5	60.7	62.7	69.8	69.9
Vehicle Noise:	74.7	72.2	69.4	68.9	75.8	76.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	157	338	729	1,570
CNEL:	163	352	758	1,634

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Gilman Mine
Road Name: Gilman Springs Rd. | Job Number: 11381
Road Segment: n/o SR-79

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,943 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,794 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	90.41%
Medium Trucks:	64.8%	8.5%	26.7%	7.53%
Heavy Trucks:	72.5%	4.7%	22.8%	2.06%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.32	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-9.48	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-15.11	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.9	68.4	66.9	64.6	71.7	72.1
Medium Trucks:	70.8	68.1	65.3	65.5	72.3	72.5
Heavy Trucks:	69.1	66.9	61.1	63.1	70.2	70.3
Vehicle Noise:	75.1	72.6	69.8	69.3	76.2	76.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	167	360	775	1,670
CNEL:	174	374	806	1,737

Wednesday, April 17, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Gilman Mine
Road Name: Bridge St. | Job Number: 11381
Road Segment: w/o Gilman Springs Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,507 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	251 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	90.41%
Medium Trucks:	64.8%	8.5%	26.7%	7.53%
Heavy Trucks:	72.5%	4.7%	22.8%	2.06%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-9.16	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	82.40	-19.95	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-25.58	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.7	59.2	57.7	55.5	62.6	62.9
Medium Trucks:	61.6	58.9	56.1	56.3	63.1	63.3
Heavy Trucks:	60.0	57.8	51.9	54.0	61.0	61.1
Vehicle Noise:	65.9	63.4	60.6	60.1	67.1	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	32	69	148	319
CNEL:	33	72	154	332

Wednesday, April 17, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project | Project Name: Gilman Mine
Road Name: Gilman Springs Rd. | Job Number: 11381
Road Segment: s/o SR-60

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,195 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,519 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	89.73%
Medium Trucks:	64.8%	8.5%	26.7%	7.47%
Heavy Trucks:	72.5%	4.7%	22.8%	2.80%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	41.037
Medium Trucks:	40.820
Heavy Trucks:	40.841

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	0.83	1.18	-1.20	-4.65	0.000	0.000
Medium Trucks:	82.40	-9.96	1.22	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-14.22	1.21	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.6	70.1	68.6	66.3	73.4	73.8
Medium Trucks:	72.5	69.8	67.0	67.2	74.0	74.2
Heavy Trucks:	72.2	70.0	64.1	66.2	73.2	73.4
Vehicle Noise:	77.2	74.7	71.7	71.4	78.3	78.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	180	387	833	1,795
CNEL:	186	402	866	1,865

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project | Project Name: Gilman Mine
Road Name: Gilman Springs Rd. | Job Number: 11381
Road Segment: s/o Allesandro Bl.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,629 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,963 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	89.83%
Medium Trucks:	64.8%	8.5%	26.7%	7.48%
Heavy Trucks:	72.5%	4.7%	22.8%	2.69%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	41.037
Medium Trucks:	40.820
Heavy Trucks:	40.841

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.54	1.18	-1.20	-4.65	0.000	0.000
Medium Trucks:	82.40	-9.26	1.22	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-13.69	1.21	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	73.3	70.8	69.3	67.0	74.1	74.5
Medium Trucks:	73.2	70.5	67.7	67.9	74.7	74.9
Heavy Trucks:	72.7	70.5	64.7	66.8	73.8	73.9
Vehicle Noise:	77.8	75.4	72.4	72.0	79.0	79.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	198	428	921	1,985
CNEL:	206	444	957	2,062

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Gilman Springs Rd.
Road Segment: s/o Jack Rabbit Tr.
Project Name: Gilman Mine
Job Number: 11381

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,612 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,961 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	89.83%
Medium Trucks:	64.8%	8.5%	26.7%	7.48%
Heavy Trucks:	72.5%	4.7%	22.8%	2.69%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.54	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-9.26	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-13.69	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.1	68.6	67.1	64.8	72.0	72.3
Medium Trucks:	71.0	68.3	65.5	65.7	72.5	72.7
Heavy Trucks:	70.5	68.3	62.5	64.6	71.6	71.7
Vehicle Noise:	75.7	73.2	70.2	69.8	76.8	77.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	182	391	843	1,817
CNEL:	189	407	876	1,887

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Gilman Springs Rd.
Road Segment: s/o Bridge St.
Project Name: Gilman Mine
Job Number: 11381

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,726 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,573 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	89.63%
Medium Trucks:	64.8%	8.5%	26.7%	7.46%
Heavy Trucks:	72.5%	4.7%	22.8%	2.91%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	0.92	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-9.88	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-13.97	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.5	68.0	66.5	64.2	71.3	71.7
Medium Trucks:	70.4	67.7	64.9	65.1	71.9	72.1
Heavy Trucks:	70.3	68.1	62.2	64.3	71.3	71.4
Vehicle Noise:	75.1	72.7	69.6	69.3	76.3	76.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	168	362	779	1,679
CNEL:	174	376	809	1,744

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Gilman Springs Rd.
Road Segment: n/o SR-79
Project Name: Gilman Mine
Job Number: 11381

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,051 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,805 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	90.11%
Medium Trucks:	64.8%	8.5%	26.7%	7.50%
Heavy Trucks:	72.5%	4.7%	22.8%	2.39%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.32	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-9.48	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.44	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.9	68.4	66.9	64.6	71.7	72.1
Medium Trucks:	70.8	68.1	65.3	65.5	72.3	72.5
Heavy Trucks:	69.8	67.6	61.7	63.8	70.8	71.0
Vehicle Noise:	75.3	72.8	69.9	69.5	76.4	76.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	172	370	796	1,715
CNEL:	178	384	828	1,784

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Bridge St.
Road Segment: w/o Gilman Springs Rd.
Project Name: Gilman Mine
Job Number: 11381

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,539 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	254 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	89.27%
Medium Trucks:	64.8%	8.5%	26.7%	7.43%
Heavy Trucks:	72.5%	4.7%	22.8%	3.29%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-9.16	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	82.40	-19.95	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-23.49	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.7	59.2	57.7	55.5	62.6	62.9
Medium Trucks:	61.6	58.9	56.1	56.3	63.1	63.3
Heavy Trucks:	62.0	59.9	54.0	56.1	63.1	63.2
Vehicle Noise:	66.6	64.1	61.0	60.7	67.7	67.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	35	76	163	351
CNEL:	36	79	169	364

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: Gilman Springs Rd.
Road Segment: s/o SR-60
Project Name: Gilman Mine
Job Number: 11381

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,488 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,549 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	90.41%
Medium Trucks:	64.8%	8.5%	26.7%	7.53%
Heavy Trucks:	72.5%	4.7%	22.8%	2.06%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	41.037
Medium Trucks:	40.820
Heavy Trucks:	40.841

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	0.92	1.18	-1.20	-4.65	0.000	0.000
Medium Trucks:	82.40	-9.88	1.22	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-15.51	1.21	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.7	70.1	68.7	66.4	73.5	73.9
Medium Trucks:	72.5	69.9	67.1	67.3	74.1	74.3
Heavy Trucks:	70.9	68.7	62.8	64.9	71.9	72.1
Vehicle Noise:	76.9	74.4	71.6	71.1	78.0	78.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	172	370	796	1,715
CNEL:	178	384	828	1,784

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: Gilman Springs Rd.
Road Segment: s/o Allesandro Bl.
Project Name: Gilman Mine
Job Number: 11381

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,608 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,061 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	90.41%
Medium Trucks:	64.8%	8.5%	26.7%	7.53%
Heavy Trucks:	72.5%	4.7%	22.8%	2.06%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	41.037
Medium Trucks:	40.820
Heavy Trucks:	40.841

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.71	1.18	-1.20	-4.65	0.000	0.000
Medium Trucks:	82.40	-9.08	1.22	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-14.71	1.21	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	73.5	70.9	69.5	67.2	74.3	74.7
Medium Trucks:	73.3	70.7	67.9	68.1	74.9	75.1
Heavy Trucks:	71.7	69.5	63.6	65.7	72.7	72.9
Vehicle Noise:	77.7	75.2	72.4	71.9	78.8	79.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	194	418	899	1,938
CNEL:	202	434	936	2,016

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: Gilman Springs Rd.
Road Segment: s/o Jack Rabbit Tr.
Project Name: Gilman Mine
Job Number: 11381

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,590 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,059 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	90.41%
Medium Trucks:	64.8%	8.5%	26.7%	7.53%
Heavy Trucks:	72.5%	4.7%	22.8%	2.06%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.71	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-9.09	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.72	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.3	68.8	67.3	65.0	72.1	72.5
Medium Trucks:	71.1	68.5	65.7	65.9	72.7	72.9
Heavy Trucks:	69.5	67.3	61.4	63.5	70.5	70.7
Vehicle Noise:	75.5	73.0	70.2	69.7	76.6	76.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	177	382	823	1,774
CNEL:	185	398	857	1,845

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: Gilman Springs Rd.
Road Segment: s/o Bridge St.
Project Name: Gilman Mine
Job Number: 11381

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,513 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,651 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	90.41%
Medium Trucks:	64.8%	8.5%	26.7%	7.53%
Heavy Trucks:	72.5%	4.7%	22.8%	2.06%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.09	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-9.71	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-15.34	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.7	68.1	66.7	64.4	71.5	71.9
Medium Trucks:	70.5	67.9	65.0	65.2	72.0	72.3
Heavy Trucks:	68.9	66.7	60.8	62.9	69.9	70.1
Vehicle Noise:	74.9	72.4	69.6	69.1	76.0	76.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	161	347	748	1,612
CNEL:	168	361	779	1,678

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: Gilman Springs Rd.
Road Segment: n/o SR-79
Project Name: Gilman Mine
Job Number: 11381

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,072 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,907 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	90.41%
Medium Trucks:	64.8%	8.5%	26.7%	7.53%
Heavy Trucks:	72.5%	4.7%	22.8%	2.06%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.49	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-9.31	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.94	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.1	68.5	67.1	64.8	71.9	72.3
Medium Trucks:	70.9	68.3	65.4	65.6	72.4	72.7
Heavy Trucks:	69.3	67.1	61.2	63.3	70.3	70.5
Vehicle Noise:	75.3	72.8	70.0	69.5	76.4	76.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	171	369	796	1,715
CNEL:	178	384	828	1,784

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA
Road Name: Bridge St.
Road Segment: w/o Gilman Springs Rd.
Project Name: Gilman Mine
Job Number: 11381

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,608 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	261 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	90.41%
Medium Trucks:	64.8%	8.5%	26.7%	7.53%
Heavy Trucks:	72.5%	4.7%	22.8%	2.06%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-8.98	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	82.40	-19.78	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-25.41	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.9	59.4	57.9	55.6	62.7	63.1
Medium Trucks:	61.8	59.1	56.3	56.5	63.3	63.5
Heavy Trucks:	60.1	57.9	52.1	54.2	61.2	61.3
Vehicle Noise:	66.1	63.6	60.8	60.3	67.3	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	33	71	152	328
CNEL:	34	74	158	341

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP
Road Name: Gilman Springs Rd.
Road Segment: s/o SR-60
Project Name: Gilman Mine
Job Number: 11381

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,694 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,569 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	89.74%
Medium Trucks:	64.8%	8.5%	26.7%	7.47%
Heavy Trucks:	72.5%	4.7%	22.8%	2.79%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	41.037
Medium Trucks:	40.820
Heavy Trucks:	40.841

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	0.92	1.18	-1.20	-4.65	0.000	0.000
Medium Trucks:	82.40	-9.88	1.22	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-14.16	1.21	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.7	70.1	68.7	66.4	73.5	73.9
Medium Trucks:	72.5	69.9	67.1	67.3	74.1	74.3
Heavy Trucks:	72.3	70.1	64.2	66.3	73.3	73.4
Vehicle Noise:	77.3	74.8	71.8	71.4	78.4	78.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	182	391	843	1,817
CNEL:	189	407	876	1,888

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP
Road Name: Gilman Springs Rd.
Road Segment: s/o Allesandro Bl.
Project Name: Gilman Mine
Job Number: 11381

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,817 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,082 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	89.85%
Medium Trucks:	64.8%	8.5%	26.7%	7.48%
Heavy Trucks:	72.5%	4.7%	22.8%	2.67%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	41.037
Medium Trucks:	40.820
Heavy Trucks:	40.841

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.71	1.18	-1.20	-4.65	0.000	0.000
Medium Trucks:	82.40	-9.08	1.22	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-13.56	1.21	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	73.5	70.9	69.5	67.2	74.3	74.7
Medium Trucks:	73.3	70.7	67.9	68.1	74.9	75.1
Heavy Trucks:	72.9	70.7	64.8	66.9	73.9	74.0
Vehicle Noise:	78.0	75.5	72.5	72.2	79.1	79.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	203	438	944	2,034
CNEL:	211	455	981	2,113

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP | Project Name: Gilman Mine
Road Name: Gilman Springs Rd. | Job Number: 11381
Road Segment: s/o Jack Rabbit Tr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,080 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	89.85%
Medium Trucks:	64.8%	8.5%	26.7%	7.48%
Heavy Trucks:	72.5%	4.7%	22.8%	2.67%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.71	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-9.09	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-13.56	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.3	68.8	67.3	65.0	72.1	72.5
Medium Trucks:	71.1	68.5	65.7	65.9	72.7	72.9
Heavy Trucks:	70.7	68.5	62.6	64.7	71.7	71.8
Vehicle Noise:	75.8	73.3	70.4	70.0	77.0	77.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	186	401	864	1,862
CNEL:	193	417	898	1,934

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP | Project Name: Gilman Mine
Road Name: Gilman Springs Rd. | Job Number: 11381
Road Segment: s/o Bridge St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,755 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,676 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	89.66%
Medium Trucks:	64.8%	8.5%	26.7%	7.46%
Heavy Trucks:	72.5%	4.7%	22.8%	2.88%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.09	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-9.71	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-13.84	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.7	68.1	66.7	64.4	71.5	71.9
Medium Trucks:	70.5	67.9	65.0	65.2	72.0	72.3
Heavy Trucks:	70.4	68.2	62.3	64.4	71.4	71.6
Vehicle Noise:	75.3	72.8	69.8	69.5	76.4	76.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	172	370	798	1,719
CNEL:	179	385	829	1,786

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP | Project Name: Gilman Mine
Road Name: Gilman Springs Rd. | Job Number: 11381
Road Segment: n/o SR-79

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,180 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,918 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	90.12%
Medium Trucks:	64.8%	8.5%	26.7%	7.50%
Heavy Trucks:	72.5%	4.7%	22.8%	2.38%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.49	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-9.31	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.29	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.1	68.5	67.1	64.8	71.9	72.3
Medium Trucks:	70.9	68.3	65.4	65.6	72.4	72.7
Heavy Trucks:	69.9	67.7	61.9	64.0	71.0	71.1
Vehicle Noise:	75.4	73.0	70.1	69.6	76.6	76.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	176	379	817	1,760
CNEL:	183	394	849	1,829

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP | Project Name: Gilman Mine
Road Name: Bridge St. | Job Number: 11381
Road Segment: w/o Gilman Springs Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,640 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	264 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	89.32%
Medium Trucks:	64.8%	8.5%	26.7%	7.44%
Heavy Trucks:	72.5%	4.7%	22.8%	3.25%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-8.98	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	82.40	-19.78	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-23.38	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.9	59.4	57.9	55.6	62.7	63.1
Medium Trucks:	61.8	59.1	56.3	56.5	63.3	63.5
Heavy Trucks:	62.2	60.0	54.1	56.2	63.2	63.3
Vehicle Noise:	66.7	64.3	61.1	60.9	67.8	68.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	36	77	167	359
CNEL:	37	80	173	373

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC | Project Name: Gilman Mine
Road Name: Gilman Springs Rd. | Job Number: 11381
Road Segment: s/o SR-60

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,262 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,626 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	90.41%
Medium Trucks:	64.8%	8.5%	26.7%	7.53%
Heavy Trucks:	72.5%	4.7%	22.8%	2.06%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	41.037
Medium Trucks:	40.820
Heavy Trucks:	40.841

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.05	1.18	-1.20	-4.65	0.000	0.000
Medium Trucks:	82.40	-9.75	1.22	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-15.38	1.21	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.8	70.3	68.8	66.5	73.6	74.0
Medium Trucks:	72.7	70.0	67.2	67.4	74.2	74.4
Heavy Trucks:	71.0	68.8	63.0	65.1	72.1	72.2
Vehicle Noise:	77.0	74.5	71.7	71.2	78.2	78.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	175	377	812	1,750
CNEL:	182	392	845	1,820

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC | Project Name: Gilman Mine
Road Name: Gilman Springs Rd. | Job Number: 11381
Road Segment: s/o Allesandro Bl.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,892 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,089 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	90.41%
Medium Trucks:	64.8%	8.5%	26.7%	7.53%
Heavy Trucks:	72.5%	4.7%	22.8%	2.06%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	41.037
Medium Trucks:	40.820
Heavy Trucks:	40.841

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.75	1.18	-1.20	-4.65	0.000	0.000
Medium Trucks:	82.40	-9.04	1.22	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-14.67	1.21	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	73.5	71.0	69.5	67.2	74.3	74.7
Medium Trucks:	73.4	70.7	67.9	68.1	74.9	75.1
Heavy Trucks:	71.7	69.6	63.7	65.8	72.8	72.9
Vehicle Noise:	77.7	75.2	72.4	71.9	78.9	79.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	195	420	905	1,950
CNEL:	203	437	942	2,029

Wednesday, April 17, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC | Project Name: Gilman Mine
Road Name: Gilman Springs Rd. | Job Number: 11381
Road Segment: s/o Jack Rabbit Tr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,881 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,088 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	90.41%
Medium Trucks:	64.8%	8.5%	26.7%	7.53%
Heavy Trucks:	72.5%	4.7%	22.8%	2.06%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.75	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-9.04	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.68	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.3	68.8	67.3	65.1	72.2	72.5
Medium Trucks:	71.2	68.5	65.7	65.9	72.7	72.9
Heavy Trucks:	69.5	67.4	61.5	63.6	70.6	70.7
Vehicle Noise:	75.5	73.0	70.2	69.7	76.7	76.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	179	385	829	1,785
CNEL:	186	400	862	1,857

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC | Project Name: Gilman Mine
Road Name: Gilman Springs Rd. | Job Number: 11381
Road Segment: s/o Bridge St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,677 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,668 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	90.41%
Medium Trucks:	64.8%	8.5%	26.7%	7.53%
Heavy Trucks:	72.5%	4.7%	22.8%	2.06%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.11	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-9.68	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-15.31	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.7	68.2	66.7	64.4	71.5	71.9
Medium Trucks:	70.6	67.9	65.1	65.3	72.1	72.3
Heavy Trucks:	68.9	66.7	60.9	62.9	70.0	70.1
Vehicle Noise:	74.9	72.4	69.6	69.1	76.0	76.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	162	349	752	1,619
CNEL:	168	363	782	1,684

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC
Road Name: Gilman Springs Rd.
Road Segment: n/o SR-79
Project Name: Gilman Mine
Job Number: 11381

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,238 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,924 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	90.41%
Medium Trucks:	64.8%	8.5%	26.7%	7.53%
Heavy Trucks:	72.5%	4.7%	22.8%	2.06%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.51	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-9.28	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.91	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.1	68.6	67.1	64.8	71.9	72.3
Medium Trucks:	71.0	68.3	65.5	65.7	72.5	72.7
Heavy Trucks:	69.3	67.1	61.2	63.3	70.4	70.5
Vehicle Noise:	75.3	72.8	70.0	69.5	76.4	76.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	172	371	799	1,721
CNEL:	179	386	831	1,791

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC
Road Name: Bridge St.
Road Segment: w/o Gilman Springs Rd.
Project Name: Gilman Mine
Job Number: 11381

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,852 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	285 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	90.41%
Medium Trucks:	64.8%	8.5%	26.7%	7.53%
Heavy Trucks:	72.5%	4.7%	22.8%	2.06%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-8.60	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	82.40	-19.39	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-25.02	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.3	59.8	58.3	56.0	63.1	63.5
Medium Trucks:	62.2	59.5	56.7	56.9	63.7	63.9
Heavy Trucks:	60.5	58.3	52.4	54.5	61.6	61.7
Vehicle Noise:	66.5	64.0	61.2	60.7	67.6	67.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	35	75	162	348
CNEL:	36	78	168	362

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC
Road Name: Gilman Springs Rd.
Road Segment: s/o SR-60
Project Name: Gilman Mine
Job Number: 11381

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,468 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,647 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	89.76%
Medium Trucks:	64.8%	8.5%	26.7%	7.47%
Heavy Trucks:	72.5%	4.7%	22.8%	2.77%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	41.037
Medium Trucks:	40.820
Heavy Trucks:	40.841

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.05	1.18	-1.20	-4.65	0.000	0.000
Medium Trucks:	82.40	-9.75	1.22	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-14.06	1.21	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.8	70.3	68.8	66.5	73.6	74.0
Medium Trucks:	72.7	70.0	67.2	67.4	74.2	74.4
Heavy Trucks:	72.4	70.2	64.3	66.4	73.4	73.5
Vehicle Noise:	77.4	74.9	71.9	71.6	78.5	78.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	185	399	859	1,851
CNEL:	192	414	892	1,923

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC
Road Name: Gilman Springs Rd.
Road Segment: s/o Allesandro Bl.
Project Name: Gilman Mine
Job Number: 11381

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,101 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,110 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	89.86%
Medium Trucks:	64.8%	8.5%	26.7%	7.48%
Heavy Trucks:	72.5%	4.7%	22.8%	2.66%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	41.037
Medium Trucks:	40.820
Heavy Trucks:	40.841

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.75	1.18	-1.20	-4.65	0.000	0.000
Medium Trucks:	82.40	-9.04	1.22	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-13.53	1.21	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	73.5	71.0	69.5	67.2	74.3	74.7
Medium Trucks:	73.4	70.7	67.9	68.1	74.9	75.1
Heavy Trucks:	72.9	70.7	64.8	66.9	73.9	74.1
Vehicle Noise:	78.0	75.6	72.6	72.2	79.2	79.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	205	441	949	2,046
CNEL:	213	458	987	2,126

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC | Project Name: Gilman Mine
Road Name: Gilman Springs Rd. | Job Number: 11381
Road Segment: s/o Jack Rabbit Tr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,091 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,109 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	89.86%
Medium Trucks:	64.8%	8.5%	26.7%	7.48%
Heavy Trucks:	72.5%	4.7%	22.8%	2.66%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.75	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-9.04	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-13.53	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.3	68.8	67.3	65.1	72.2	72.5
Medium Trucks:	71.2	68.5	65.7	65.9	72.7	72.9
Heavy Trucks:	70.7	68.5	62.6	64.7	71.7	71.9
Vehicle Noise:	75.9	73.4	70.4	70.0	77.0	77.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	187	403	869	1,873
CNEL:	195	419	903	1,946

Wednesday, April 17, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC | Project Name: Gilman Mine
Road Name: Gilman Springs Rd. | Job Number: 11381
Road Segment: s/o Bridge St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,919 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,692 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	89.67%
Medium Trucks:	64.8%	8.5%	26.7%	7.46%
Heavy Trucks:	72.5%	4.7%	22.8%	2.87%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.12	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-9.68	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-13.83	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.7	68.2	66.7	64.4	71.5	71.9
Medium Trucks:	70.6	67.9	65.1	65.3	72.1	72.3
Heavy Trucks:	70.4	68.2	62.3	64.4	71.4	71.6
Vehicle Noise:	75.3	72.9	69.8	69.5	76.5	76.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	173	372	801	1,726
CNEL:	179	386	832	1,793

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC | Project Name: Gilman Mine
Road Name: Gilman Springs Rd. | Job Number: 11381
Road Segment: n/o SR-79

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,346 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,935 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	90.12%
Medium Trucks:	64.8%	8.5%	26.7%	7.50%
Heavy Trucks:	72.5%	4.7%	22.8%	2.38%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	1.51	-0.99	-1.20	-4.70	0.000	0.000
Medium Trucks:	82.40	-9.28	-0.97	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.27	-0.97	-1.20	-5.31	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.1	68.6	67.1	64.8	71.9	72.3
Medium Trucks:	71.0	68.3	65.5	65.7	72.5	72.7
Heavy Trucks:	70.0	67.8	61.9	64.0	71.0	71.1
Vehicle Noise:	75.5	73.0	70.1	69.7	76.6	76.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	177	380	820	1,766
CNEL:	184	396	852	1,836

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC | Project Name: Gilman Mine
Road Name: Bridge St. | Job Number: 11381
Road Segment: w/o Gilman Springs Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,884 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	288 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	66.9%	11.9%	21.2%	89.41%
Medium Trucks:	64.8%	8.5%	26.7%	7.45%
Heavy Trucks:	72.5%	4.7%	22.8%	3.15%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-8.60	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	82.40	-19.39	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-23.13	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.3	59.8	58.3	56.0	63.1	63.5
Medium Trucks:	62.2	59.5	56.7	56.9	63.7	63.9
Heavy Trucks:	62.4	60.2	54.3	56.4	63.4	63.6
Vehicle Noise:	67.1	64.6	61.5	61.2	68.2	68.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	38	82	176	379
CNEL:	39	85	182	393

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APPENDIX 9.1:

OPERATIONAL NOISE LEVEL CALCULATIONS

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STATIONARY SOURCE NOISE PREDICTION MODEL 11/5/2019

Observer Location: **R1**
Source: Crushing & Screening Activity
Condition: Operational

Project Name: Gilman Springs Mine
Job Number: 11381
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	8,406.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	8,406.0	feet	*Noise Source Height:*	30.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,470.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	2,005.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	2,005.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	72.7	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	8,406.0	-48.9	-48.9	-48.9	-48.9	-48.9	-48.9
Shielding (Barrier Attenuation)	8,406.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		23.8	-48.9	-48.9	-48.9	-48.9	-48.9
60 Minute Hourly Adjustment		**23.8**	**-48.9**	**-48.9**	**-48.9**	**-48.9**	**-48.9**

STATIONARY SOURCE NOISE PREDICTION MODEL 11/5/2019

Observer Location: **R1**
Source: Loader Activity & Backup Alarms
Condition: Operational

Project Name: Gilman Springs Mine
Job Number: 11381
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	8,123.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	8,123.0	feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,470.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	2,005.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	2,005.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	79.8	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	8,123.0	-48.7	-48.7	-48.7	-48.7	-48.7	-48.7
Shielding (Barrier Attenuation)	8,123.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		31.1	-48.7	-48.7	-48.7	-48.7	-48.7
60 Minute Hourly Adjustment		**31.1**	**-48.7**	**-48.7**	**-48.7**	**-48.7**	**-48.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/5/2019

Observer Location: **R1**
Source: Heavy Equipment & Dozers
Condition: Operational

Project Name: Gilman Springs Mine
Job Number: 11381
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	8,123.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	8,123.0 feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,470.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	2,005.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	2,005.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	84.0	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	8,123.0	-48.7	-48.7	-48.7	-48.7	-48.7	-48.7
Shielding (Barrier Attenuation)	8,123.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		35.3	-48.7	-48.7	-48.7	-48.7	-48.7
60 Minute Hourly Adjustment		**35.3**	**-48.7**	**-48.7**	**-48.7**	**-48.7**	**-48.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/5/2019

Observer Location: **R1**
Source: Haul Truck Loading & Pass-bys
Condition: Operational

Project Name: Gilman Springs Mine
Job Number: 11381
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	9,753.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	9,753.0 feet	*Noise Source Height:*	12.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,470.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	2,005.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	2,005.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	50.0	62.1	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	9,753.0	-45.8	-45.8	-45.8	-45.8	-45.8	-45.8
Shielding (Barrier Attenuation)	9,753.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		16.3	-45.8	-45.8	-45.8	-45.8	-45.8
60 Minute Hourly Adjustment		**16.3**	**-45.8**	**-45.8**	**-45.8**	**-45.8**	**-45.8**

STATIONARY SOURCE NOISE PREDICTION MODEL 11/5/2019

Observer Location: **R2**
Source: Crushing & Screening Activity
Condition: Operational

Project Name: Gilman Springs Mine
Job Number: 11381
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	3,735.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	3,735.0	feet	*Noise Source Height:*	30.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,503.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	2,005.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	2,005.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	72.7	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	3,735.0	-41.9	-41.9	-41.9	-41.9	-41.9	-41.9
Shielding (Barrier Attenuation)	3,735.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		30.8	-41.9	-41.9	-41.9	-41.9	-41.9
60 Minute Hourly Adjustment		**30.8**	**-41.9**	**-41.9**	**-41.9**	**-41.9**	**-41.9**

STATIONARY SOURCE NOISE PREDICTION MODEL 11/5/2019

Observer Location: **R2**
Source: Loader Activity & Backup Alarms
Condition: Operational

Project Name: Gilman Springs Mine
Job Number: 11381
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	3,735.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	3,735.0	feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,503.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	2,005.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	2,005.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	79.8	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	3,735.0	-41.9	-41.9	-41.9	-41.9	-41.9	-41.9
Shielding (Barrier Attenuation)	3,735.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		37.9	-41.9	-41.9	-41.9	-41.9	-41.9
60 Minute Hourly Adjustment		**37.9**	**-41.9**	**-41.9**	**-41.9**	**-41.9**	**-41.9**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/5/2019

Observer Location: **R2**
Source: Heavy Equipment & Dozers
Condition: Operational

Project Name: Gilman Springs Mine
Job Number: 11381
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	3,735.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	3,735.0 feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,503.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	2,005.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	2,005.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	84.0	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	3,735.0	-41.9	-41.9	-41.9	-41.9	-41.9	-41.9
Shielding (Barrier Attenuation)	3,735.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		42.1	-41.9	-41.9	-41.9	-41.9	-41.9
60 Minute Hourly Adjustment		**42.1**	**-41.9**	**-41.9**	**-41.9**	**-41.9**	**-41.9**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/5/2019

Observer Location: **R2**
Source: Haul Truck Loading & Pass-bys
Condition: Operational

Project Name: Gilman Springs Mine
Job Number: 11381
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	5,412.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	5,412.0 feet	*Noise Source Height:*	12.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,503.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	2,005.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	2,005.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	50.0	62.1	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	5,412.0	-40.7	-40.7	-40.7	-40.7	-40.7	-40.7
Shielding (Barrier Attenuation)	5,412.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		21.4	-40.7	-40.7	-40.7	-40.7	-40.7
60 Minute Hourly Adjustment		**21.4**	**-40.7**	**-40.7**	**-40.7**	**-40.7**	**-40.7**

STATIONARY SOURCE NOISE PREDICTION MODEL 11/5/2019

Observer Location: **R3**
Source: Crushing & Screening Activity
Condition: Operational

Project Name: Gilman Springs Mine
Job Number: 11381
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	3,842.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	3,842.0	feet	*Noise Source Height:*	30.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,458.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	2,005.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	2,005.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	72.7	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	3,842.0	-42.1	-42.1	-42.1	-42.1	-42.1	-42.1
Shielding (Barrier Attenuation)	3,842.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		30.6	-42.1	-42.1	-42.1	-42.1	-42.1
60 Minute Hourly Adjustment		**30.6**	**-42.1**	**-42.1**	**-42.1**	**-42.1**	**-42.1**

STATIONARY SOURCE NOISE PREDICTION MODEL 11/5/2019

Observer Location: **R3**
Source: Loader Activity & Backup Alarms
Condition: Operational

Project Name: Gilman Springs Mine
Job Number: 11381
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	3,970.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	3,970.0	feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,458.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	2,005.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	2,005.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	79.8	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	3,970.0	-42.4	-42.4	-42.4	-42.4	-42.4	-42.4
Shielding (Barrier Attenuation)	3,970.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		37.4	-42.4	-42.4	-42.4	-42.4	-42.4
60 Minute Hourly Adjustment		**37.4**	**-42.4**	**-42.4**	**-42.4**	**-42.4**	**-42.4**

STATIONARY SOURCE NOISE PREDICTION MODEL 11/5/2019

Observer Location: **R3**
Source: Heavy Equipment & Dozers
Condition: Operational

Project Name: Gilman Springs Mine
Job Number: 11381
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	3,970.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	3,970.0 feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,458.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	2,005.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	2,005.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	84.0	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	3,970.0	-42.4	-42.4	-42.4	-42.4	-42.4	-42.4
Shielding (Barrier Attenuation)	3,970.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		41.6	-42.4	-42.4	-42.4	-42.4	-42.4
60 Minute Hourly Adjustment		**41.6**	**-42.4**	**-42.4**	**-42.4**	**-42.4**	**-42.4**

STATIONARY SOURCE NOISE PREDICTION MODEL 11/5/2019

Observer Location: **R3**
Source: Haul Truck Loading & Pass-bys
Condition: Operational

Project Name: Gilman Springs Mine
Job Number: 11381
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	2,500.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	2,500.0 feet	*Noise Source Height:*	12.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,458.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	1,809.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,809.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	50.0	62.1	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	2,500.0	-34.0	-34.0	-34.0	-34.0	-34.0	-34.0
Shielding (Barrier Attenuation)	2,500.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		28.1	-34.0	-34.0	-34.0	-34.0	-34.0
60 Minute Hourly Adjustment		**28.1**	**-34.0**	**-34.0**	**-34.0**	**-34.0**	**-34.0**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/5/2019

Observer Location: **R4**
Source: Crushing & Screening Activity
Condition: Operational

Project Name: Gilman Springs Mine
Job Number: 11381
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	8,041.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	8,041.0	feet	*Noise Source Height:*	30.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,579.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	2,005.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	2,005.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	72.7	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	8,041.0	-48.6	-48.6	-48.6	-48.6	-48.6	-48.6
Shielding (Barrier Attenuation)	8,041.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		24.1	-48.6	-48.6	-48.6	-48.6	-48.6
60 Minute Hourly Adjustment		**24.1**	**-48.6**	**-48.6**	**-48.6**	**-48.6**	**-48.6**

STATIONARY SOURCE NOISE PREDICTION MODEL

11/5/2019

Observer Location: **R4**
Source: Loader Activity & Backup Alarms
Condition: Operational

Project Name: Gilman Springs Mine
Job Number: 11381
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	7,702.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	7,702.0	feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,579.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	2,005.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	2,005.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	79.8	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	7,702.0	-48.2	-48.2	-48.2	-48.2	-48.2	-48.2
Shielding (Barrier Attenuation)	7,702.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		31.6	-48.2	-48.2	-48.2	-48.2	-48.2
60 Minute Hourly Adjustment		**31.6**	**-48.2**	**-48.2**	**-48.2**	**-48.2**	**-48.2**

STATIONARY SOURCE NOISE PREDICTION MODEL 11/5/2019

Observer Location: **R4**
Source: Heavy Equipment & Dozers
Condition: Operational

Project Name: Gilman Springs Mine
Job Number: 11381
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	7,702.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	7,702.0	feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,579.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	2,005.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	2,005.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	84.0	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	7,702.0	-48.2	-48.2	-48.2	-48.2	-48.2	-48.2
Shielding (Barrier Attenuation)	7,702.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		35.8	-48.2	-48.2	-48.2	-48.2	-48.2
60 Minute Hourly Adjustment		**35.8**	**-48.2**	**-48.2**	**-48.2**	**-48.2**	**-48.2**

STATIONARY SOURCE NOISE PREDICTION MODEL 11/5/2019

Observer Location: **R4**
Source: Haul Truck Loading & Pass-bys
Condition: Operational

Project Name: Gilman Springs Mine
Job Number: 11381
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	6,334.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	6,334.0	feet	*Noise Source Height:*	12.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	1,579.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	1,579.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	1,579.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	50.0	62.1	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	6,334.0	-42.1	-42.1	-42.1	-42.1	-42.1	-42.1
Shielding (Barrier Attenuation)	6,334.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		20.0	-42.1	-42.1	-42.1	-42.1	-42.1
60 Minute Hourly Adjustment		**20.0**	**-42.1**	**-42.1**	**-42.1**	**-42.1**	**-42.1**

APPENDIX 9.2:

REFERENCE MEASUREMENT PHOTOS

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1_Crushing
33, 56' 34.102400"116, 51' 52.152100"

2_Screening
33, 56' 30.476900"116, 51' 49.432900"

3_Mining Equipment
33, 56' 31.973800"116, 51' 51.547800"

4_Loader Pass-By
33, 56' 34.102400"116, 51' 52.152100"

5_Loader Backup Alarm_1
33, 55' 34.309300"116, 52' 3.852500"

6_Loader Backup Alarm_2
33, 56' 35.503200"116, 51' 52.454200"

7_Haul Truck
33, 56' 30.325900"116, 51' 48.773800"

8_Haul Truck
33, 56' 30.325900"116, 51' 48.773800"

9_Dozer
33, 31' 16.660000"117, 37' 0.310000"

10_Heavy Equipment
33, 31' 16.710000"117, 37' 0.530000"

APPENDIX 9.3:

REFERENCE BLASTING CALCULATIONS

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BLAST AT CLOSEST RECEIVER LOCATION

Scaled Distance

Source: ISEE's Blaster's Handbook, 2018 Edition.

Square Root Scaled Distance

$SD_2 = R / W^{1/2}$

R =	2450	feet	Distance to closest receiver location as shown on Exhibit 9-A to the worst-case blast location.
W =	1500	lbs	Maximum charge weight provided by the Project Applicant.

SD_2 = 63.26 ft/lbs$^{1/2}$

Peak Particle Velocity

$PPV = A * (SD_2)^{-B}$

A =	182	**Quarry Best Fit**
SD_2 =	63.26	
B =	1.82	

PPV = 0.10 in/sec

Vibration Amplitude Equations For Various Blasting Industries

Industry	Metric Equations mm/sec.	U.S. Equations in./sec.	Confidence level	Source
General	$PPV = 1{,}140(SD_2)^{-1.6}$	$PPV = 160(SD_2)^{-1.6}$	Best Fit	DuPont
Construction	$PPV = 173(SD_2)^{-1.6}$	$PPV = 24.2(SD_2)^{-1.6}$	Lower Bound	Oriard
Construction	$PPV = 1{,}730(SD_2)^{-1.6}$	$PPV = 242(SD_2)^{-1.6}$	Upper Bound	Oriard (2005)
Construction	$PPV = 4{,}320(SD_2)^{-1.6}$	$PPV = 605(SD_2)^{-1.6}$	Upper Bound - High Confinement	Oriard (2005)
Construction	$PPV = 53(SD_2)^{-1.09}$	$PPV = 5(SD_2)^{-1.09}$	Best Fit	USBM RI 8507
Quarries	$PPV = 1{,}090(SD_2)^{-1.82}$	$PPV = 182(SD_2)^{-1.82}$	Best Fit	USBM Bulletin 656
Coal Mines	$PPV = 905(SD_2)^{-1.52}$	$PPV = 119(SD_2)^{-1.52}$	Best Fit	USBM RI 8507
Coal Mines	$PPV = 3{,}330(SD_2)^{-1.52}$	$PPV = 438(SD_2)^{-1.52}$	Upper bound	USBM RI 8507
Coal - Low Frequency sites	$PPV = 1{,}252(SD_2)^{-1.31}$	$PPV = 138(SD_2)^{-1.31}$	Best Fit	USBM RI 9226

Air Overpressure/Airblast

Cubed Root Scaled Distance

$SD_3 = R / W^{1/3}$

R =	2450	feet
W =	1500	lbs

SD_3 = 214.03 ft/lbs$^{1/3}$

Air Overpressure Prediction

$P = A * SD_3^{-B}$

Project (Worst-Case)

A =	1.32	**Quarry Best Fit**
SD_3 =	214.03	
B =	0.97	

P = 0.0072 psi

Air Overpressure Prediction Equations

Blasting	Metric Equations mb	U.S. Equations psi	Statistical Type	Source
Open air (no confinement)	$P = 3589 \times SD_3^{-1.38}$	$P = 187 \times SD_3^{-1.38}$	Best Fit	Perkins
Coal mines (parting)	$P = 2596 \times SD_3^{-1.62}$	$P = 169 \times SD_3^{-1.62}$	Best Fit	USBM RI 8485
Coal mines (highwall)	$P = 5.37 \times SD_3^{-0.79}$	$P = 0.162 \times SD_3^{-0.79}$	Best Fit	USBM RI 8485
Quarry face	$P = 37.1 \times SD_3^{-0.97}$	$P = 1.32 \times SD_3^{-0.97}$	Best Fit	USBM RI 8485
Metal Mine	$P = 14.3 \times SD_3^{-0.71}$	$P = 0.401 \times SD_3^{-0.71}$	Best Fit	USBM RI 8485
Construction (average)	$P = 24.8 \times SD_3^{-1.1}$	$P = 1 \times SD_3^{-1.1}$	Best Fit	Oriard (2005)
Construction (highly confined)	$P = 2.48 \times SD_3^{-1.1}$	$P = 0.1 \times SD_3^{-1.1}$	Best Fit	Oriard (2005)
Buried (total confinement)	$P = 1.73 \times SD_3^{-0.96}$	$P = 0.061 \times SD_3^{-0.96}$	Best Fit	USBM RI 8485

Decibels (Linear)

$P_s = 20 * \log(P / P_0)$

P =	0.0072 psi	
P_0 =	2.9E-09 pascals	Reference value: $2.9 * 10^{-9}$ lbs/inch^2

P_s = 127.95 dB