APPENDIX N

3.10 Noise

INTRODUCTION

This section discusses the existing noise environment in the project vicinity, and identifies potential noise impacts and mitigation measures related to development of the Knighton and Churn Creek Commons Retail Center Development project. Specifically, this section analyzes potential noise impacts due to and upon development of the project relative to applicable noise criteria and to the existing ambient noise environment.

3.101 ENVIRONMENTAL SETTING

Acoustical Terminology

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective: one person's music is another's headache.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels, but are expressed as dB, unless otherwise noted.

The decibel scale is logarithmic, not linear. In other words, two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-

weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70 dBA sound is half as loud as an 80 dBA sound, and twice as loud as a 60 dBA sound.

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

The day/night average level (L_{dn}) is based upon the average noise level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment.

Table 3.10-1 lists several examples of the noise levels associated with common situations. Appendix A provides a summary of acoustical terms used in this report.

Effects of Noise on People

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

- Subjective effects of annoyance, nuisance, and dissatisfaction
- Interference with activities such as speech, sleep, and learning
- Physiological effects such as hearing loss or sudden startling

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

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

Table 310-1
Typical Nose Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source: Caltrans, Technical Noise Supplement, Traffic Noise Analysis Protocol. October 1998.

With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference;
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10 dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6 dB per doubling of distance from the source, depending on environmental conditions (i.e. atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

Project Description, Location, and Existing Land Uses in the Project Vicinity

The proposed project is located at the northeast corner of the Interstate 5 (I-5) and Knighton Road interchange in the Churn Creek Bottom area south of the City of Redding. Figure 3.10-1 shows the project conceptual design and regional location. The project site is bound by I-5 to the west, Knighton Road to the south, Churn Creek Road to the east, and low density residential to the north.

Land uses in the vicinity of the project site include: Travel Associates Travel Center to the south, rural residential neighborhoods to the north, west, and east of the project site, Pacheco Elementary School, and a mobile home/trailer park to the southeast. A portion of the project site is bordered by East Niles Lane to the north.

The project proposes to develop and operate a commercial retail, dining, entertainment and lodging center on approximately 92 acres. When completed the project would include approximately 740,000 square feet of mixed commercial development (which may include retail shops, restaurants, lodging, food supplies, recreation activities and equipment, traveler services and entertainment-related facilities) to be phased in over three to four years. There will be approximately 3,400 parking spaces. The northern most 18 acres of the project site would serve as an open space buffer between the proposed commercial development and existing low-density residential uses to the north, and would contain the wastewater treatment facilities

Existing Noise Environment in the Project Vicinity

The project area noise environment is subjectively considered fairly loud, as it is located directly east of Interstate 5 (I-5). Noise sources audible at the project site during the noise measurement surveys consisted of traffic noise from I-5 and Knighton Road, Churn Creek Road, typical elementary school noise, such as, school bells, kids playing at recess and truck traffic associated with the TA Travel Center along Knighton Road. To quantify typical noise levels in the immediate project vicinity, continuous 24-hour ambient noise surveys were conducted on February 4, 2009.

Site A was located in the front yard of a single family residence at 7775 Churn Creek Road.

Noise measurement equipment consisted of Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meters. The meters were calibrated before and after use with an LDL Model CA200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4).

A summary of the noise measurement data for the 24-hour continuous noise measurement site is shown in Table 3.10-2. The results of the noise measurements are shown graphically on Figure 3.10-2. Noise measurement locations are shown on Figure 3.10-1.

Table 3.10-2
Summary of Continuous Measured Ambient Noise Levels at Site A
Residential Front Yard to the East of the Project Site

Ldn	Average Hourly Daytime (7:00am - 10:00pm)			Average Hourly Nighttime (10:00pm – 7:00am)		
	Leq	L50	Lmax	Leq	L50	Lmax
66.7 dBA	65.0 dB	57 dB	80.1 dB	58.5 dB	52 dB	76.9 dB
Source: j.c. brennan & associates, Inc. - 2005						

In addition to the 24-hr continuous noise measurement, short-term ambient noise measurements were conducted at three locations on and in the vicinity of the project site on February 3rd and 4th, 2009. The noise measurement sites are designated as Sites #1 through #3.

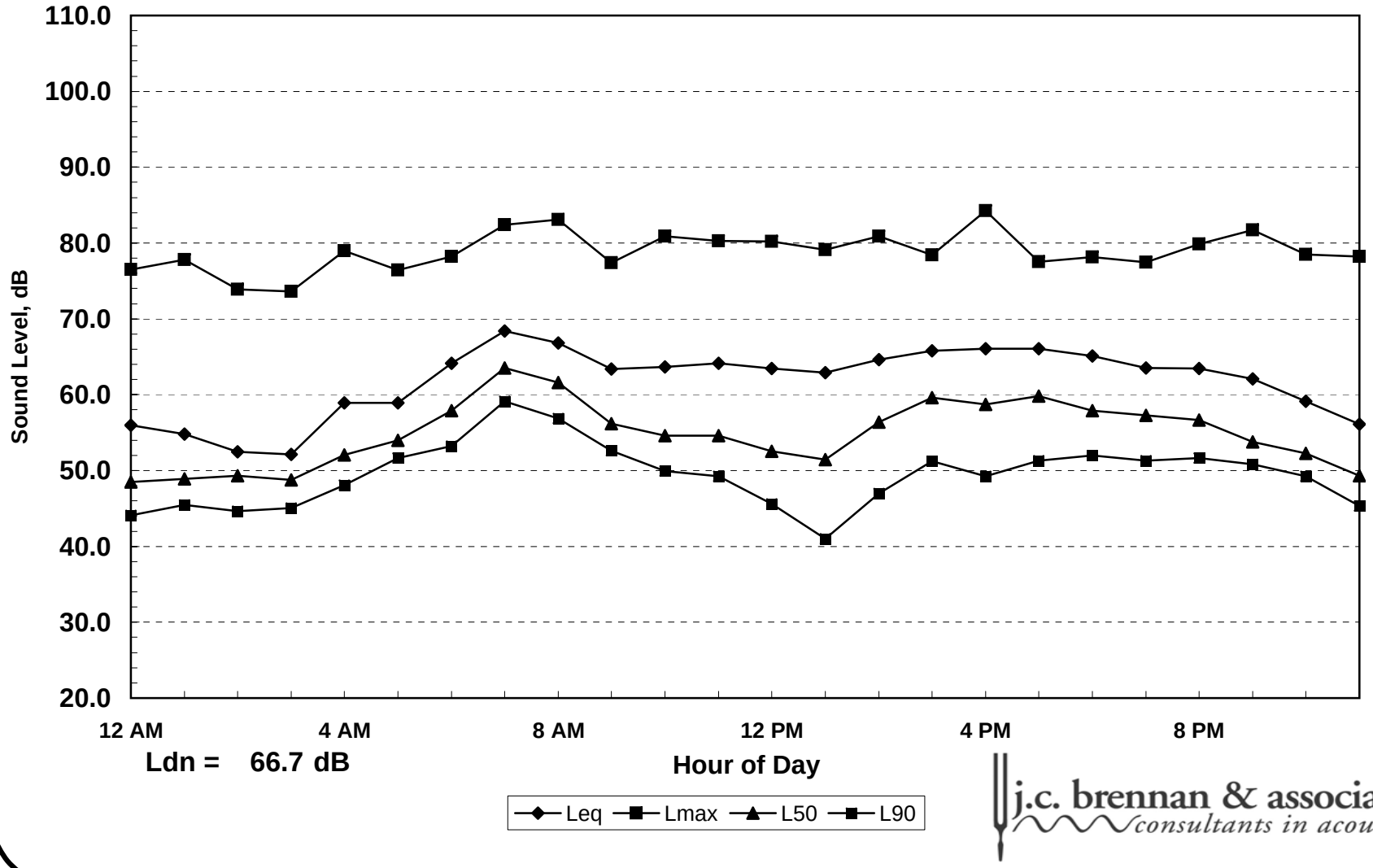
Figure 3.10-1
Project Site Plan & Noise Measurement Locations

Source: Quad Knopf

△ **Noise Measurement Sites**

j.c. brennan & associates
consultants in acoustics

Figure 3.9-2
Knighton and Churn Creek Commons Retail Center
24hr Continuous Noise Monitoring - Site A
Wednesday, February 04, 2009



Ldn = 66.7 dB

j.c. brennan & associates
consultants in acoustics

Noise measurement equipment consisted of Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meters. The meters were calibrated before and after use with an LDL Model CA200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4).

A summary of the noise measurement data for the short-term ambient noise measurement sites are shown in Table 3.10-2. Noise measurement locations are shown on Figure 3.10-1.

Table 3.10-2
Existing Ambient Noise Monitoring Results

Site	Location	Time	Date	Duration (Min)	Average Measured Hourly Noise Levels, dBA	
					Leq	Lmax
1	Western Boundary of Project Site	3:45 pm	2/3/09	15	73.2	82.5
		9:40 am	2/4/09		71.1	82.3
2	Southeast Corner of Knighton and Churn Creek	2:53 pm	2/3/09	15	64.1	77.5
		10:20 am	2/4/09		63,6	74.2
3	North of Pacheco School Road	3:07 pm	2/3/09	15	59.1	76.9
		11:10 am	2/4/09		58.2	75.9
Source: j.c. brennan & associates, Inc., 2006						

Existing Roadway Traffic Noise Levels

To describe existing traffic noise levels on the area roadways, j.c. brennan & associates, Inc. used the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108). The FHWA model is the analytical method currently favored for highway traffic noise prediction by most state and local agencies, including the California Department of Transportation (Caltrans).

The FHWA model is based upon the Calveno reference noise emission factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA model was developed to predict hourly Leq values for free-flowing traffic conditions. To predict Ldn values, it is necessary to determine the day/night distribution of traffic and adjust the traffic volume input data to yield an equivalent hourly traffic volume.

Average daily traffic (ADT) volumes for existing conditions were obtained from the traffic study prepared for the project by Fehr and Peers. The FHWA Model inputs are contained in Appendix B. Tables 3.10-3 and 3.10-4 show the predicted existing traffic noise levels at a reference distance of 100 feet from the roadway centerlines. Table 3.10-3 and 3.10-4 represent the weekend and weekday traffic noise levels, respectively.

Table 3.10-3
Existing Weekend
Traffic Noise Levels and Distances to Noise Contours

Roadway	Segment	ADT	Ldn @ 100 feet	Distance to Ldn Contour (feet)[1]		
				60 dB	65 dB	70 dB
Knighton Road	I-5 NB Ramp to I-5 SB Ramp	4,466	61 dB	120	56	26
Knighton Road	I-5 NB Ramp to Churn Creek Road	4,772	58 dB	73	34	16
Knighton Road	Churn Creek Road to Airport Road	2,379	54 dB	40	19	9
Churn Creek Road	Knighton Road to E. Niles Lane	1,946	56 dB	52	24	11
Churn Creek Road	E Niles Lane to Rancho Road	3,336	58 dB	74	34	16
Churn Creek Road	Rancho Road to I-5	12,824	64 dB	182	84	39
I-5	Churn Creek Rd to Knighton Rd	56,000	78 dB	1,558	737	342
I-5	Knighton Road to Riverside Ave	56,000	78 dB	1,558	737	342

[1] Distances to traffic noise contours are measured in feet from the centerlines of the roadways.
Source: FHWA-RD-77-108 with inputs from Fehr and Peers Transportation Consultants, Caltrans and j.c. brennan & associates, Inc.

Table 3.10-4
Existing Weekday
Traffic Noise Levels and Distances to Noise Contours

Roadway	Segment	ADT	Ldn @ 100 feet	Distance to Ldn Contour (feet)[1]		
				60 dB	65 dB	70 dB
Knighton Road	I-5 NB Ramp to I-5 SB Ramp	5,572	62 dB	3139	65	30
Knighton Road	I-5 NB Ramp to Churn Creek Road	6,705	59 dB	92	43	20
Knighton Road	Churn Creek Road to Airport Road	3,756	56 dB	54	25	12
Churn Creek Road	Knighton Road to E. Niles Lane	2,753	57 dB	65	30	14
Churn Creek Road	E Niles Lane to Rancho Road	4,100	59 dB	85	39	18
Churn Creek Road	Rancho Road to I-5	15,296	65 dB	205	95	44
I-5	Churn Creek Rd to Knighton Rd	56,000	78 dB	1,558	737	342
I-5	Knighton Road to Riverside Ave	56,000	78 dB	1,558	737	342

[1] Distances to traffic noise contours are measured in feet from the centerlines of the roadways.
Source: FHWA-RD-77-108 with inputs from Fehr and Peers Transportation Consultants, Caltrans and j.c. brennan & associates, Inc.

3.10-2 REGULATORY SETTING

Federal

There are no federal noise requirements or regulations that bear directly on local actions of Shasta County. The Noise Control Act of 1972 directed the United States Environmental Protection Agency (EPA) to develop noise guidelines that would protect the population from the adverse effects of environmental noise. The EPA published a guideline, entitled EPA Levels Document, Report No. 556/9-74-664, containing recommendations for noise levels affecting residential land use of 55 Ldn dBA for outdoors and 45 Ldn dBA for indoors. The agency is careful to stress that the recommendations contain a factor of safety and do not consider technical or economic feasibility issues, and therefore, should not be construed as standards or regulations.

The Federal Department of Housing and Urban Development (HUD) standards (24 CFR Part 51, subpart B) define the 65 Ldn dBA as an acceptable outdoor noise level for residential uses. If outdoor noise levels exceed 75 dBA Ldn, the interior noise level in residential homes could exceed 45 dBA, however, with proper insulation and other construction techniques, the interior noise level can be reduced to the 45 dBA level.

State of California

California encourages each local jurisdiction to perform noise studies and implement a noise element as part of its general plan. The Governor's Office of Planning and Research (in conjunction with the California Department of Health Services) has published guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. The Department of Health guidelines indicate that residential land uses and other noise-sensitive uses would generally be acceptable without special noise insulation requirements in areas where exterior ambient noise levels do not exceed approximately 60 dBA (day-night noise levels, Ldn or CNEL). Residential uses in areas with an Ldn between 60 and 65 dBA would generally be acceptable with noise reduction measures or insulation, and residential uses should generally be discouraged in areas where noise levels are above 65 dBA Ldn.

California Environmental Quality Act (CEQA) Standards:

Criteria for determining the significance of noise impacts were developed based on information contained in the California Environmental Quality Act Guidelines (State CEQA Guidelines). According to those guidelines, a project may have a significant effect on the environment if it will satisfy the following conditions:

A. Exposure of persons to or generation of noise levels in excess of standards established in the local jurisdiction General Plan. Specifically, exterior noise levels of 60 dB Ldn for traffic noise sources and the standards shown in Table 3.10-4 for on-site activities.
B. A substantial permanent increase in ambient noise levels in the project vicinity

above levels existing without the project. For this project, a substantial increase is considered to be more than 4 dB.

C. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. For this project, a substantial increase is considered to be more than 4 dB.

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

E. For a project within the vicinity of a private airstrip, where the project would expose people residing or working in the project area to excessive noise levels.

Shasta County General Plan

The goals of the Shasta County General Plan Noise Element are:

1. To protect County residents from the harmful and annoying effects of exposure to excessive noise.

2. To protect the economic base of the County by preventing incompatible land uses from encroaching upon existing or planned noise-producing uses.

3. To encourage the application of state of the art land use planning methodologies in areas of potential noise conflicts.

The following specific policies which would be applicable to this project were adopted by the Shasta County General Plan to accomplish the goals of the Noise Element:

1. Noise created by new proposed non-transportation noise sources shall be mitigated so as not to exceed the noise level standards of Table 3.10-4 (of this report) as measured immediately within the property line of lands designated for noise-sensitive uses.

Note: For the purposes of the Noise Element, transportation noise sources are defined as traffic on public roadways, railroad line operations and aircraft in flight. Control of noise from these sources is preempted by Federal and State regulations. Other noise sources are presumed to be subject to local regulations, such as a noise control ordinance. Non-transportation noise sources may include industrial operations, outdoor recreation facilities, HVAC units, loading docks, etc.

3. Where proposed non-residential land uses are likely to produce noise levels exceeding the performance standards of Table 3.10-5 (of this report) existing or

planned noise-sensitive uses, an acoustical analysis shall be required as part of the environmental review process so that noise mitigation may be included in the project design.

Table 3.10-5
Noise Level Performance Standards for New Projects
Affected by or Including Non-transportation Sources

Noise Level Descriptor	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly L_{eq}, dB	55	50
Maximum level, dB	75	65

Each of the noise levels specified above shall be lowered by five dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises (e.g., humming sounds, outdoor speaker systems). These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings).

The County can impose noise level standards which are more restrictive than those specified above based upon determination of existing low ambient noise levels.

In rural areas where large lots exist, the exterior noise level standard shall be applied at a point 100' away from the residence.

Industrial, light industrial, commercial and public service facilities which have the potential for producing objectionable noise levels at nearby noise-sensitive uses are dispersed throughout the County. Fixed noise sources which are typically of concern include, but are not limited to the following:

HVAC Systems	Cooling Towers/Evaporative Condensers
Pump Stations	Lift Stations
Emergency Generators	Boilers
Steam Valves	Steam Turbines
Generators	Fans
Air Compressors	Heavy Equipment
Conveyor Systems	Transformers
Pile Drivers	Grinders
Drill Rigs	Gas or Diesel Motors
Welders	Cutting Equipment
Outdoor Speakers	Blowers

The types of uses which may typically produce the noise sources described above include but are not limited to: industrial facilities including lumber mills, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, car washes, loading docks, public works projects, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, landfills, sand and gravel operations, and athletic fields.

6a. Noise created by new transportation noise sources shall be mitigated so as not to exceed the levels specified in Table 3.10-6 (of this report) at outdoor activity areas or interior spaces of existing noise-sensitive land uses.

8. Where noise mitigation measures are required to achieve the County's noise standards, the emphasis of such measures shall be placed upon site planning and project design. The use of noise barriers shall be considered a means of achieving the noise standards only after all other practical design-related noise mitigation measures have been integrated into the project.

Table 3.10-6
Maximum Allowable Noise Exposure
Transportation Noise Sources

Land Use	Outdoor Activity Areas[1] L_{dn}/CNEL, dB	Interior Spaces	
		L_{dn}/CNEL,dB	L_{eq}, dB[2]
Residential	60[3]	45	--
Transient Lodging	60[4]	45	--
Hospitals, Nursing Homes	60[3]	45	--
Theaters, Auditoriums, Music Halls	--	--	35
Churches, Meeting Halls	60[3]	--	40
Office Buildings	--	--	45
Schools, Libraries, Museums	--	--	45
Playgrounds, Neighborhood Parks	70	--	--

[1] Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use. Where it is not practical to mitigate exterior noise levels at patio or balconies of apartment complexes, a common area such as a pool or recreation area may be designated as the outdoor activity area.

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

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

[4] In the case of hotel/motel facilities or other transient lodging, outdoor activity areas such as pool areas may not be included in the project design. In these cases, only the interior noise level criterion will apply.

Vibration Impact Criteria

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to the vibration will depend on their individual

sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating. Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities in inches per second. Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of peak particle velocities.

Shasta County does not contain specific policies pertaining to vibration levels. However, vibration levels associated with construction activities are discussed in this report.

Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Table 3.10-7, which was developed by Caltrans, shows the vibration levels which would normally be required to result in damage to structures. The vibration levels are presented in terms of peak particle velocity in inches per second.

Table 3.10-7 indicates that the threshold for damage to structures ranges from 2 to 6 in/sec. One-half this minimum threshold or 1 in/sec p.p.v. is considered a safe criterion that would protect against architectural or structural damage. The general threshold at which human annoyance could occur is notes as 0.1 in/sec p.p.v.

Table 3.10-7
Effects of Vibration on People and Buildings

Peak Particle Velocity inches/second	Peak Particle Velocity mm/second	Human Reaction	Effect on Buildings
0-.006	0.15	Imperceptible by people	Vibrations unlikely to cause damage of any type
.006-.02	0.5	Range of Threshold of perception	Vibrations unlikely to cause damage of any type
.08	2.0	Vibrations clearly perceptible	Recommended upper level of which ruins and ancient monuments should be subjected
0.1	2.54	Level at which continuous vibrations begin to annoy people	Virtually no risk of architectural damage to normal buildings
0.2	5.0	Vibrations annoying to people in buildings	Threshold at which there is a risk of architectural damage to normal dwellings
1.0	25.4		Architectural Damage
2.0	50.4		Structural Damage to Residential Buildings
6.0	151.0		Structural Damage to Commercial Buildings

Source: Survey of Earth-borne Vibrations due to Highway Construction and Highway Traffic, Caltrans 1976.

Significance of Changes in Ambient Noise Levels

The potential increase in traffic noise from the project is a factor in determining significance. Research into the human perception of changes in sound level indicates the following:

- A 3 dB change is barely perceptible,
- A 5 dB change is clearly perceptible, and
- A 10 dB change is perceived as being twice or half as loud.

3.10-3 METHODOLOGY

The analysis of noise impacts for this project focuses on the following areas:

1. Noise impacts due to increased traffic;
2. Noise impacts due to on-site truck deliveries and loading dock operations;
3. Noise impacts due to roof-top HVAC equipment;
4. Noise impacts due to construction activities;
5. Vibration impacts due to construction activities

Noise Impact Assessment Methodology for Traffic Noise

To describe future noise levels due to traffic, the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108) was used. The FHWA model is based upon the Calveno reference noise factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site.

The FHWA model was developed to predict hourly Leq values for free-flowing traffic conditions. To predict Ldn/CNEL values, it is necessary to determine the day/night distribution of traffic and adjust the traffic volume input data to yield an equivalent hourly traffic volume.

Table 3.10-8 shows the results of the traffic noise analysis for the Existing Plus Project scenario during a weekend day. Table 3.10-9 shows the results of the traffic noise analysis for the Existing Plus Project scenario during a week day

Table 3.10-8
Existing Plus Project Weekend
Traffic Noise Levels and Distances to Noise Contours

Roadway	Segment	ADT	Ldn @ 100 feet	Δ[1]	Distance to Contour (feet)[2]	
					60 dB	65 dB
Knighton Road	I-5 NB Ramp to I-5 SB Ramp	17,086	67 dB	**6 dB**	294	136
Knighton Road	I-5 NB Ramp to Churn Creek Road	29,697	66 dB	**8 dB**	248	115
Knighton Road	Churn Creek Road to Airport Road	6,481	58 dB	4 dB	78	36
Churn Creek Road	Knighton Road to E. Niles Lane	4,155	59 dB	3 dB	86	40
Churn Creek Road	E Niles Lane to Rancho Road	5,229	60 dB	2 dB	100	46
Churn Creek Road	Rancho Road to I-5	13,140	64 dB	0 dB	185	86
I-5	Churn Creek Rd to Knighton Rd	NA	--	--	--	--
I-5	Knighton Road to Riverside Ave	NA	--	--	--	--

[1] Denotes change in dB.
[2] Distances to traffic noise contours are measured in feet from the centerlines of the roadways.
Source: FHWA-RD-77-108 with inputs from Fehr and Peers Transportation Consultants, Caltrans and j.c. brennan & associates, Inc.
NA-Traffic volumes were not available for the analysis.
Bold represents a significant increase in traffic noise levels.

Table 3.10-9
Existing Plus Project Weekday
Traffic Noise Levels and Distances to Noise Contours

Roadway	Segment	ADT	Ldn @ 100 feet	Δ[1]	Distance to Contour (feet)[2]	
					60 dB	65 dB
Knighton Road	I-5 NB Ramp to I-5 SB Ramp	15,492	67 dB	**5 dB**	275	128
Knighton Road	I-5 NB Ramp to Churn Creek Road	26,298	65 dB	**6 dB**	229	106
Knighton Road	Churn Creek Road to Airport Road	6,980	59 dB	3 dB	82	38
Churn Creek Road	Knighton Road to E. Niles Lane	4,489	59 dB	2 dB	90	42
Churn Creek Road	E Niles Lane to Rancho Road	5,588	60 dB	1 dB	105	49
Churn Creek Road	Rancho Road to I-5	15,544	65 dB	0 dB	207	96
I-5	Churn Creek Rd to Knighton Rd	NA	--	--	--	--
I-5	Knighton Road to Riverside Ave	NA	--	--	--	--

[1] Denotes change in dB.
[2] Distances to traffic noise contours are measured in feet from the centerlines of the roadways.
Source: FHWA-RD-77-108 with inputs from Fehr and Peers Transportation Consultants, Caltrans and j.c. brennan & associates, Inc.
NA-Traffic volumes were not available for the analysis.
Bold represents a significant increase in traffic noise levels.

Table 3.10-10
Cumulative No Project Weekend
Traffic Noise Levels and Distances to Noise Contours

Roadway	Segment	ADT	Ldn @ 100 feet	Distance to Ldn Contour (feet) [1]		
				60 dB	65 dB	70 dB
Knighton Road	I-5 NB Ramp to I-5 SB Ramp	6,300	63 dB	151	70	33
Knighton Road	I-5 NB Ramp to Churn Creek Road	9,200	61 dB	113	53	24
Knighton Road	Churn Creek Road to Airport Road	4,500	57 dB	61	28	13
Churn Creek Road	Knighton Road to E. Niles Lane	3,900	59 dB	82	38	18
Churn Creek Road	E Niles Lane to Rancho Road	4,300	59 dB	88	41	19
Churn Creek Road	Rancho Road to I-5	13,300	64 dB	186	87	40
I-5	Churn Creek Rd to Knighton Rd	79,000	80 dB	1997	927	430
I-5	Knighton Road to Riverside Ave	77,000	79 dB	1963	911	423

[1] Distances to traffic noise contours are measured in feet from the centerlines of the roadways.
Source: FHWA-RD-77-108 with inputs from Fehr and Peers Transportation Consultants, Caltrans and j.c. brennan & associates, Inc.

Table 3.10-11
Cumulative No Project Weekday
Traffic Noise Levels and Distances to Noise Contours

Roadway	Segment	ADT	Ldn @ 100 feet	Distance to Ldn Contour (feet) [1]		
				60 dB	65 dB	70 dB
Knighton Road	I-5 NB Ramp to I-5 SB Ramp	7,500	63 dB	170	79	37
Knighton Road	I-5 NB Ramp to Churn Creek Road	11,100	62 dB	129	60	28
Knighton Road	Churn Creek Road to Airport Road	5,600	58 dB	71	33	15
Churn Creek Road	Knighton Road to E. Niles Lane	4,800	60 dB	95	44	20
Churn Creek Road	E Niles Lane to Rancho Road	5,000	60 dB	97	45	21
Churn Creek Road	Rancho Road to I-5	17,000	65 dB	220	102	47
I-5	Churn Creek Rd to Knighton Rd	79,000	80 dB	1997	927	430
I-5	Knighton Road to Riverside Ave	77,000	79 dB	1963	911	423

[1] Distances to traffic noise contours are measured in feet from the centerlines of the roadways.
Source: FHWA-RD-77-108 with inputs from Fehr and Peers Transportation Consultants, Caltrans and j.c. brennan & associates, Inc.

Table 3.10-12
Cumulative Plus Project Weekend
Traffic Noise Levels and Distances to Noise Contours

Roadway	Segment	ADT	Ldn @ 100 feet	Δ[1]	Distance to Contour (feet)[2]	
					60 dB	65 dB
Knighton Road	I-5 NB Ramp to I-5 SB Ramp	18,920	67 dB	4 dB	314	146
Knighton Road	I-5 NB Ramp to Churn Creek Road	34,125	67 dB	**6 dB**	272	126
Knighton Road	Churn Creek Road to Airport Road	8,602	60 dB	3 dB	94	44
Churn Creek Road	Knighton Road to E. Niles Lane	6,109	61 dB	2 dB	111	52
Churn Creek Road	E Niles Lane to Rancho Road	6,193	61 dB	2 dB	112	52
Churn Creek Road	Rancho Road to I-5	13,616	64 dB	0 dB	189	88
I-5	Churn Creek Rd to Knighton Rd	NA	--	--	--	--
I-5	Knighton Road to Riverside Ave	NA	--	--	--	--

[1] Denotes change in dB.
[2] Distances to traffic noise contours are measured in feet from the centerlines of the roadways.
Source: FHWA-RD-77-108 with inputs from Fehr and Peers Transportation Consultants, Caltrans and j.c. brennan & associates, Inc.
NA- Traffic volumes were not available for the analysis.
Bold represents a significant increase in traffic noise levels.

Table 3.10-13
Cumulative Plus Project Weekday
Traffic Noise Levels and Distances to Noise Contours

Roadway	Segment	ADT	Ldn @ 100 feet	Δ[1]	Distance to Contour (feet)[2]	
					60 dB	65 dB
Knighton Road	I-5 NB Ramp to I-5 SB Ramp	17,420	67 dB	4 dB	297	138
Knighton Road	I-5 NB Ramp to Churn Creek Road	30,693	66 dB	4 dB	253	118
Knighton Road	Churn Creek Road to Airport Road	8,824	60 dB	2 dB	96	44
Churn Creek Road	Knighton Road to E. Niles Lane	6,536	61 dB	1 dB	116	54
Churn Creek Road	E Niles Lane to Rancho Road	6,488	61 dB	1 dB	116	54
Churn Creek Road	Rancho Road to I-5	17,248	65 dB	0 dB	222	103
I-5	Churn Creek Rd to Knighton Rd	NA	--	--	--	--
I-5	Knighton Road to Riverside Ave	NA	--	--	--	--

[1] Denotes change in dB.
[2] Distances to traffic noise contours are measured in feet from the centerlines of the roadways.
Source: FHWA-RD-77-108 with inputs from Fehr and Peers Transportation Consultants, Caltrans and j.c. brennan & associates, Inc.
NA- Traffic volumes were not available for the analysis

Noise Impact Assessment Methodology for On-Site Project Truck Circulation and Loading Dock Noise

Noise impacts due to the loading dock activities include truck traffic arrivals and departures, and loading dock noise levels at the loading dock. The proposed project designates loading dock areas along the east, and west sides of the project, as well as the northeast portion of the site.

To determine typical loading dock and truck circulation noise levels associated with the proposed project, j.c. brennan, Inc. used noise level measurement data collected on at a Safeway Store loading dock during a peak morning hour. Noise level measurements were conducted at a distance of 50 feet from the loading dock. During the one hour sample of loading dock noise levels, there were 3 semi truck arrivals and 4 semi truck departures, unloading activities, 1 semi truck passby on the service road, and 4 step side delivery trucks at the adjacent delivery area.

The noise level measurements were conducted for a one hour period, and the noise measurements of the loading dock activities were confirmed to represent a typical busy hour of loading dock operations. The analysis indicated that during a busy hour of loading dock operations, the measured hourly Leq noise level was 60 dB at a distance of 50 feet from the loading dock. The measured maximum level was 81 dB.

The location of the loading docks along the east side of the project site are approximately 75 feet from the nearest residential property line across Churn Creek Road. Therefore, the predicted noise levels at the property line are 56.5 dB Leq and 77.5 dB Lmax.

The location of the loading docks on the west side of the project site are located within approximately 125 feet from the nearest residential property line, which is located near the northwest corner of the project site. The predicted noise levels at the residential property line are 52 dB Leq and 73 dB Lmax.

Noise Impact Assessment Methodology for On-Site HVAC Mechanical Equipment Noise

The primary HVAC noise associated with large commercial building include air-conditioning equipment and cooling towers located on roof tops. For the Major stores j.c. brennan & associates, Inc. utilized the roof-top HVAC equipment noise level data provided for a Home Depot store. Based upon the Home Depot Store in Auburn California, 20 packaged rooftop air conditioning systems with 15 to 20 tons of refrigeration each are required. The roof-top HVAC units are predicted to generate noise levels of approximately 55 dB per unit, at a reference distance of 100.

When these units are spaced out across a roof top, they will produce a sound level of approximately 60 dB at a distance of 100 feet from the edge of the roof-top.

Noise Impact Assessment Methodology for Construction Noise

Construction noise was analyzed using data compiled by the Federal Highway Administration Roadway Construction Noise Model User's Guide.

Activities involved in construction would generate maximum noise levels, as indicated in Table 3.10-14, ranging from 76 to 90 dB at a distance of 50 feet. Construction activities would be temporary in nature and are anticipated to occur during normal daytime working hours.

Table 3.10-14
Construction Equipment Noise

Type of Equipment	Maximum Level, dB at 50 feet
Backhoe	78
Compactor	83
Compressor (air)	78
Concrete Saw	90
Dozer	82
Dump Truck	76
Excavator	81
Generator	81
Jackhammer	89
Pneumatic Tools	85

Source: *Roadway Construction Noise Model User's Guide*. Federal Highway Administration. FHWA-HEP-05-054. January 2006.

Vibration Impact Assessment Methodology for Construction-related Vibration

The types of construction vibration impacts include human annoyance and building structural damage. The analysis of construction vibration impacts will utilize vibration data for various pieces of construction equipment compiled by the Federal Transit Administration. Table 3.10-15 provides a list of vibration levels expected from various types of construction equipment.

Table 3.10-15 Vibration Levels for Varying Construction Equipment		
Type of Equipment	Peak Particle Velocity @ 25 feet (inches/second)	Approximate Velocity Level @ 25 feet (VdB)
Large Bulldozer	0.089	87
Loaded Trucks	0.076	86
Small Bulldozer	0.003	58
Auger/drill Rigs	0.089	87
Jackhammer	0.035	79
Vibratory Hammer	0.070	85
Vibratory Compactor/roller	0.210	94
Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Guidelines, May 2006		

Noise Impact Methodology for the Wastewater Treatment Plant Operations

A wastewater treatment plant is proposed along the northern portion of the project site. Noise level data collected for a packaged wastewater treatment plants in Sutter Creek and Roseville, California was used to determine the potential noise impacts associated with the project.

3.10-4 SPECIFIC IMPACTS AND MITIGATION MEASURES

Traffic Noise Impacts

Impact 1: Traffic Noise Level Increases at Existing Land Uses in the Project Area.

Existing residences located along Knighton Road and Churn Creek Road may experience a significant increase in traffic noise levels due to the project-related traffic. In review of Tables 3.10-8 and 3.10-9, the predicted Existing Plus Project scenarios indicate that a significant increase in traffic noise levels will occur along Knighton Road along two roadway segments, between the northbound ramps and the southbound ramps, and between the northbound ramp and Churn Creek Road. This is expected to occur during both the weekend days and the weekdays.

In review of Tables 3.10-12 and 3.10-13, the predicted Cumulative Plus Project scenarios indicate that a significant increase in traffic noise levels will occur along Knighton Road between the northbound ramps and Churn Creek Road on the weekend days.

Since the roadway segment between the southbound and northbound ramps does not have any noise-sensitive land uses adjacent to Knighton Road, the increase in traffic noise is not considered significant for that segment.

The increase in traffic noise levels along the segment of Knighton Road between the northbound ramps and Churn Creek is considered to be significant.

Mitigation for Impact 1:

Implementation of the following noise mitigation measures would reduce this impact to a *less than significant level.*

MM 1: One of the means of reducing overall traffic noise levels along the cut through routes is to use a rubberized asphalt pavement or open gap pavement along Knighton Road between the northbound ramps and Churn Creek Road. Studies conducted for the Sacramento County Department of Environmental Review and Assessment and Transportation Department to determine the noise reduction provided by rubberized asphalt have been completed in recent years. Those studies indicate that the use of rubberized asphalt on Sacramento County roadways appears to have resulted in an average traffic noise level reduction of approximately 4 dB over that provided by conventional asphalt.

Significance after Mitigation: Less than Significant

<u>Truck Circulation and Loading Dock Noise Impacts</u>

Impact 2: On-Site truck circulation and loading dock activity may result in an exceedance of the Shasta County General Plan noise level criteria for non-transportation noise sources.

Based upon the analysis, the location of the loading docks along the east side of the project site are approximately 75 feet from the nearest residential property line across Churn Creek Road. The predicted noise levels at the property line are 56.5 dB Leq and 77.5 dB Lmax. The predicted noise levels will exceed the daytime and nighttime noise level criteria. This is a significant noise impact.

The location of the loading docks on the west side of the project site are located within approximately 125 feet from the nearest residential property line, which is located near the northwest corner of the project site. The predicted loading dock noise levels at the residential property line are 52 dB Leq and 73 dB Lmax. The predicted noise levels will exceed the nighttime noise level criteria. Due to the proximity of I-5 adjacent to the loading docks on the west side of the project site, the loading dock operations are not expected to result in an increase in background noise levels at this location.

Mitigation for Impact 2:

Implementation of the following noise mitigation measures would reduce this impact to a *less than significant level.*

MM 2a: A barrier 8-feet in height should be constructed along the east property line, adjacent to the loading dock areas as shown on Figure 3.10-3.

MM 2b: Loading dock operations along the east side of the project site shall be restricted to the daytime hours of 7:00 a.m. to 10:00 p.m.

Significance after Mitigation: Less than Significant

HVAC Noise Impacts

Impact 3: Roof-top HVAC equipment may result in noise levels which exceed the Shasta County noise level criteria.

During the summer months HVAC equipment may run continually during the nighttime hours. Therefore, the HVAC equipment would be required to comply with the 45 dB Leq hourly noise level criterion. This is a potentially significant impact.

Mitigation for Impact 3:

Implementation of the following noise mitigation measures would reduce this impact to a *less than significant level.*

MM3a: Commercial building located along the perimeter of the project site will require parapets 4-feet in height along the facades facing residential uses. As an alternative to parapets, roof-top HVAC equipment can be fitted with exhaust silencers or individual barriers. Since roof-top plans are not available at this time, a supplemental noise study can be provided when the roof-top mechanical plan is available. In addition, as an alternative, HVAC equipment could be located on the ground and shielded from residences by building facades or wing walls.

Significance after Mitigation: Less than Significant

Figure 3.10-3
Project Site Plan & Noise Barrier Locations

Source: Quad Knopf

Location of 8-foot tall barrier

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Construction Noise Impacts

Impact 4: Activities associated with construction will result in temporary elevated noise levels within the immediate area.

Activities involved in construction would generate maximum noise levels, as indicated in Table 3.10-14, ranging from 76 to 90 dB at a distance of 50 feet. Construction activities would be temporary in nature and are anticipated to occur during normal daytime working hours.

Because construction activities could result in periods of elevated noise levels at existing residences, this impact is considered potentially significant.

Mitigation for Impact 4:

Implementation of the following noise mitigation measures would reduce this impact to a *less than significant level.*

MM 4: Construction activities should be restricted to daytime hours. Construction equipment should be equipped with proper mufflers and in good working order.

Locate fixed construction equipment such as compressors and generators as far as possible from sensitive receptors. Shroud or shield all impact tools, and muffle or shield all intakes and exhaust ports on power construction equipment.

Significance after Mitigation: Less than Significant

Construction Vibration Impacts

Impact 5: The primary construction activities associated with the project would occur when the infrastructure such as buildings and utilities are constructed. Comparing Table 3.10-7 which contains the criteria for acceptable vibration levels to Table 3.10-15, which shows potential vibration impacts, it is not expected that vibration impacts would occur which would cause any structural damage. This impact is considered to be less than significant.

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Mitigation for Impact 5: None Required

Wastewater Treatment Plant Noise Impacts

Impact 6: Activities associated with the wastewater treatment plant includes pumps, aerators, emergency generators and blowers which could result in noise impacts at nearby residences. Noise levels associated with influent pumps are in the range of 50 dB to 60 dB at a distance of 25 feet. Blowers and compressors which are generally located inside

block buildings can produce noise levels as high as 80 dB at 20 feet. Aerators which are located in oxidation ditches can produce noise levels of approximately 65 dB at 50 feet. This impact is potentially significant.

Mitigation for Impact 6:

Implementation of the following noise mitigation measures would reduce this impact to a *less than significant level.*

MM 6: All pumps shall be submersible pumps or located inside of enclosures. The blowers shall be located inside of a concrete block building. Aerators shall be located below ground level in the aeration basins. All equipment operations shall comply with the daytime exterior noise level criterion of 55 dB Leq, and the nighttime exterior noise level criterion of 45 dB Leq at the nearest residential property lines.

Significance after Mitigation: Less than Significant

Appendix A

Acoustical Terminology

Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
Attenuation	The reduction of an acoustic signal.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz.
Ldn	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
Leq	Equivalent or energy-averaged sound level.
Lmax	The highest root-mean-square (RMS) sound level measured over a given period of time.
L(n)	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L50 is the sound level exceeded 50% of the time during the one hour period.
Loudness	A subjective term for the sensation of the magnitude of sound.
Noise	Unwanted sound.
Peak Noise	The level corresponding to the highest (not RMS) sound pressure measured over a given period of time. This term is often confused with the "Maximum" level, which is the highest RMS level.
RT_{60}	The time it takes reverberant sound to decay by 60 dB once the source has been removed.
Sabin	The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 sabin.
Threshold of Hearing	The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.
Threshold of Pain	Approximately 120 dB above the threshold of hearing.
Impulsive	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
Simple Tone	Any sound which can be judged as audible as a single pitch or set of single pitches.

Appendix B-1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2009-102 Pocatello
Description: Existing Weekend Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Knighton Road	I-5 SB Ramp to I-5 NB Ramp	4,466	85		15	2.5	10	35	100	
2	Knighton Road	I-5 NB Ramp to Churn Creek Road	4,772	85		15	1.5	2.5	35	100	
3	Knighton Road	Churn Creek Road to Airport Road	2,379	85		15	2.5	1	35	100	
4	Churn Creek Road	Knighton Road to E. Niles Lane	1,946	85		15	2.5	1	45	100	
5	Churn Creek Road	E Niles Lane to Rancho Road	3,336	85		15	2.5	1	45	100	
6	Churn Creek Road	Rancho Road to I-5	12,824	85		15	2.5	1	45	100	
7	I-5	Churn Creek Rd to Knighton Rd	56,000	76		24	1	12	65	100	
8	I-5	Knighton road to Riverside Ave	56,000	76		24	1	12	65	100	
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Appendix B-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2009-102 Pocatello
Description: Existing Weekend Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Knighton Road	I-5 SB Ramp to I-5 NB Ramp	54.4	48.6	59.9	61
2	Knighton Road	I-5 NB Ramp to Churn Creek Road	55.1	46.7	54.1	58
3	Knighton Road	Churn Creek Road to Airport Road	52.1	45.9	47.1	54
4	Churn Creek Road	Knighton Road to E. Niles Lane	54.3	46.7	47.3	56
5	Churn Creek Road	E Niles Lane to Rancho Road	56.7	49.1	49.6	58
6	Churn Creek Road	Rancho Road to I-5	62.5	54.9	55.4	64
7	I-5	Churn Creek Rd to Knighton Rd	74.4	61.1	75.4	78
8	I-5	Knighton road to Riverside Ave	74.4	61.1	75.4	78

Appendix B-3

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2009-102 Pocatello
Description: Existing Weekend Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	-------- Distances to Traffic Noise Contours -------- 75	70	65	60	55
1	Knighton Road	I-5 SB Ramp to I-5 NB Ramp	12	26	56	120	259
2	Knighton Road	I-5 NB Ramp to Churn Creek Road	7	16	34	73	158
3	Knighton Road	Churn Creek Road to Airport Road	4	9	19	40	86
4	Churn Creek Road	Knighton Road to E. Niles Lane	5	11	24	52	112
5	Churn Creek Road	E Niles Lane to Rancho Road	7	16	34	74	160
6	Churn Creek Road	Rancho Road to I-5	18	39	84	182	392
7	I-5	Churn Creek Rd to Knighton Rd	159	342	737	1588	3420
8	I-5	Knighton road to Riverside Ave	159	342	737	1588	3420

Appendix C-1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2009-102 Pocatello
Description: Existing Plus Project Weekend Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Knighton Road	I-5 SB Ramp to I-5 NB Ramp	17,086	85		15	2.5	10	35	100	
2	Knighton Road	I-5 NB Ramp to Churn Creek Road	29,697	85		15	1.5	2.5	35	100	
3	Knighton Road	Churn Creek Road to Airport Road	6,481	85		15	2.5	1	35	100	
4	Churn Creek Road	Knighton Road to E. Niles Lane	4,155	85		15	2.5	1	45	100	
5	Churn Creek Road	E Niles Lane to Rancho Road	5,229	85		15	2.5	1	45	100	
6	Churn Creek Road	Rancho Road to I-5	13,140	85		15	2.5	1	45	100	
7	I-5	Churn Creek Rd to Knighton Rd	NA	76		24	1	12	65	100	
8	I-5	Knighton road to Riverside Ave	NA	76		24	1	12	65	100	
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Appendix C-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2009-102 Pocatello
Description: Existing Plus Project Weekend Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Knighton Road	I-5 SB Ramp to I-5 NB Ramp	60.2	54.5	65.7	67
2	Knighton Road	I-5 NB Ramp to Churn Creek Road	63.0	54.6	62.1	66
3	Knighton Road	Churn Creek Road to Airport Road	56.4	50.3	51.5	58
4	Churn Creek Road	Knighton Road to E. Niles Lane	57.6	50.0	50.5	59
5	Churn Creek Road	E Niles Lane to Rancho Road	58.6	51.0	51.5	60
6	Churn Creek Road	Rancho Road to I-5	62.6	55.0	55.5	64
7	I-5	Churn Creek Rd to Knighton Rd	#VALUE!	#VALUE!	#VALUE!	#VALUE!
8	I-5	Knighton road to Riverside Ave	#VALUE!	#VALUE!	#VALUE!	#VALUE!

Appendix C-3

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2009-102 Pocatello
Description: Existing Plus Project Weekend Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Knighton Road	I-5 SB Ramp to I-5 NB Ramp	29	63	136	294	632
2	Knighton Road	I-5 NB Ramp to Churn Creek Road	25	53	115	248	534
3	Knighton Road	Churn Creek Road to Airport Road	8	17	36	78	168
4	Churn Creek Road	Knighton Road to E. Niles Lane	9	18	40	86	185
5	Churn Creek Road	E Niles Lane to Rancho Road	10	22	46	100	216
6	Churn Creek Road	Rancho Road to I-5	18	40	86	185	398
7	I-5	Churn Creek Rd to Knighton Rd	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
8	I-5	Knighton road to Riverside Ave	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!

Appendix F-1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 2009-102 Pocatello
Description: Cumulative Weekend No Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Knighton Road	I-5 SB Ramp to I-5 NB Ramp	6,300	85		15	2.5	10	35	100	
2	Knighton Road	I-5 NB Ramp to Churn Creek Road	9,200	85		15	1.5	2.5	35	100	
3	Knighton Road	Churn Creek Road to Airport Road	4,500	85		15	2.5	1	35	100	
4	Churn Creek Road	Knighton Road to E. Niles Lane	3,900	85		15	2.5	1	45	100	
5	Churn Creek Road	E Niles Lane to Rancho Road	4,300	85		15	2.5	1	45	100	
6	Churn Creek Road	Rancho Road to I-5	13,300	85		15	2.5	1	45	100	
7	I-5	Churn Creek Rd to Knighton Rd	79,000	76		24	1	12	65	100	
8	I-5	Knighton road to Riverside Ave	77,000	76		24	1	12	65	100	
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Appendix F-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2009-102 Pocatello
Description: Cumulative Weekend No Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Knighton Road	I-5 SB Ramp to I-5 NB Ramp	55.9	50.1	61.3	63
2	Knighton Road	I-5 NB Ramp to Churn Creek Road	57.9	49.6	57.0	61
3	Knighton Road	Churn Creek Road to Airport Road	54.8	48.7	49.9	57
4	Churn Creek Road	Knighton Road to E. Niles Lane	57.4	49.8	50.3	59
5	Churn Creek Road	E Niles Lane to Rancho Road	57.8	50.2	50.7	59
6	Churn Creek Road	Rancho Road to I-5	62.7	55.1	55.6	64
7	I-5	Churn Creek Rd to Knighton Rd	75.9	62.6	76.9	80
8	I-5	Knighton road to Riverside Ave	75.8	62.5	76.8	79

Appendix F-3

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2009-102 Pocatello
Description: Cumulative Weekend No Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Knighton Road	I-5 SB Ramp to I-5 NB Ramp	15	33	70	151	325
2	Knighton Road	I-5 NB Ramp to Churn Creek Road	11	24	53	113	245
3	Knighton Road	Churn Creek Road to Airport Road	6	13	28	61	131
4	Churn Creek Road	Knighton Road to E. Niles Lane	8	18	38	82	177
5	Churn Creek Road	E Niles Lane to Rancho Road	9	19	41	88	189
6	Churn Creek Road	Rancho Road to I-5	19	40	87	186	402
7	I-5	Churn Creek Rd to Knighton Rd	200	430	927	1997	4302
8	I-5	Knighton road to Riverside Ave	196	423	911	1963	4229

Appendix G-1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 2009-102 Pocatello
Description: Cumulative Plus Project Weekend Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Knighton Road	I-5 SB Ramp to I-5 NB Ramp	18,920	85		15	2.5	10	35	100	
2	Knighton Road	I-5 NB Ramp to Churn Creek Road	34,125	85		15	1.5	2.5	35	100	
3	Knighton Road	Churn Creek Road to Airport Road	8,602	85		15	2.5	1	35	100	
4	Churn Creek Road	Knighton Road to E. Niles Lane	6,109	85		15	2.5	1	45	100	
5	Churn Creek Road	E Niles Lane to Rancho Road	6,193	85		15	2.5	1	45	100	
6	Churn Creek Road	Rancho Road to I-5	13,616	85		15	2.5	1	45	100	
7	I-5	Churn Creek Rd to Knighton Rd	NA	76		24	1	12	65	100	
8	I-5	Knighton road to Riverside Ave	NA	76		24	1	12	65	100	
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Appendix G-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2009-102 Pocatello
Description: Cumulative Plus Project Weekend Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Knighton Road	I-5 SB Ramp to I-5 NB Ramp	60.7	54.9	66.1	67
2	Knighton Road	I-5 NB Ramp to Churn Creek Road	63.6	55.3	62.7	67
3	Knighton Road	Churn Creek Road to Airport Road	57.7	51.5	52.7	60
4	Churn Creek Road	Knighton Road to E. Niles Lane	59.3	51.7	52.2	61
5	Churn Creek Road	E Niles Lane to Rancho Road	59.4	51.8	52.3	61
6	Churn Creek Road	Rancho Road to I-5	62.8	55.2	55.7	64
7	I-5	Churn Creek Rd to Knighton Rd	#VALUE!	#VALUE!	#VALUE!	#VALUE!
8	I-5	Knighton road to Riverside Ave	#VALUE!	#VALUE!	#VALUE!	#VALUE!

Appendix G-3

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2009-102 Pocatello
Description: Cumulative Plus Project Weekend Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Knighton Road	I-5 SB Ramp to I-5 NB Ramp	31	68	146	314	677
2	Knighton Road	I-5 NB Ramp to Churn Creek Road	27	59	126	272	586
3	Knighton Road	Churn Creek Road to Airport Road	9	20	44	94	202
4	Churn Creek Road	Knighton Road to E. Niles Lane	11	24	52	111	239
5	Churn Creek Road	E Niles Lane to Rancho Road	11	24	52	112	241
6	Churn Creek Road	Rancho Road to I-5	19	41	88	189	408
7	I-5	Churn Creek Rd to Knighton Rd	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
8	I-5	Knighton road to Riverside Ave	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!

Appendix B-1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 2009-102 Pocatello
Description: Existing Weekday Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Knighton Road	I-5 SB Ramp to I-5 NB Ramp	5,572	85		15	2.5	10	35	100	
2	Knighton Road	I-5 NB Ramp to Churn Creek Road	6,705	85		15	1.5	2.5	35	100	
3	Knighton Road	Churn Creek Road to Airport Road	3,756	85		15	2.5	1	35	100	
4	Churn Creek Road	Knighton Road to E. Niles Lane	2,753	85		15	2.5	1	45	100	
5	Churn Creek Road	E Niles Lane to Rancho Road	4,100	85		15	2.5	1	45	100	
6	Churn Creek Road	Rancho Road to I-5	15,296	85		15	2.5	1	45	100	
7	I-5	Churn Creek Rd to Knighton Rd	56,000	76		24	1	12	65	100	
8	I-5	Knighton road to Riverside Ave	56,000	76		24	1	12	65	100	
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Appendix B-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2009-102 Pocatello
Description: Existing Weekday Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Knighton Road	I-5 SB Ramp to I-5 NB Ramp	55.3	49.6	60.8	62
2	Knighton Road	I-5 NB Ramp to Churn Creek Road	56.6	48.2	55.6	59
3	Knighton Road	Churn Creek Road to Airport Road	54.1	47.9	49.1	56
4	Churn Creek Road	Knighton Road to E. Niles Lane	55.9	48.2	48.8	57
5	Churn Creek Road	E Niles Lane to Rancho Road	57.6	50.0	50.5	59
6	Churn Creek Road	Rancho Road to I-5	63.3	55.7	56.2	65
7	I-5	Churn Creek Rd to Knighton Rd	74.4	61.1	75.4	78
8	I-5	Knighton road to Riverside Ave	74.4	61.1	75.4	78

Appendix B-3

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2009-102 Pocatello
Description: Existing Weekday Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Knighton Road	I-5 SB Ramp to I-5 NB Ramp	14	30	65	139	300
2	Knighton Road	I-5 NB Ramp to Churn Creek Road	9	20	43	92	198
3	Knighton Road	Churn Creek Road to Airport Road	5	12	25	54	116
4	Churn Creek Road	Knighton Road to E. Niles Lane	7	14	30	65	141
5	Churn Creek Road	E Niles Lane to Rancho Road	9	18	39	85	183
6	Churn Creek Road	Rancho Road to I-5	20	44	95	205	441
7	I-5	Churn Creek Rd to Knighton Rd	159	342	737	1588	3420
8	I-5	Knighton road to Riverside Ave	159	342	737	1588	3420

Appendix C-1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 2009-102 Pocatello
Description: Existing Plus Project Weekday Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Knighton Road	I-5 SB Ramp to I-5 NB Ramp	15,492	85		15	2.5	10	35	100	
2	Knighton Road	I-5 NB Ramp to Churn Creek Road	26,298	85		15	1.5	2.5	35	100	
3	Knighton Road	Churn Creek Road to Airport Road	6,980	85		15	2.5	1	35	100	
4	Churn Creek Road	Knighton Road to E. Niles Lane	4,489	85		15	2.5	1	45	100	
5	Churn Creek Road	E Niles Lane to Rancho Road	5,588	85		15	2.5	1	45	100	
6	Churn Creek Road	Rancho Road to I-5	15,544	85		15	2.5	1	45	100	
7	I-5	Churn Creek Rd to Knighton Rd	NA	76		24	1	12	65	100	
8	I-5	Knighton road to Riverside Ave	NA	76		24	1	12	65	100	
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Appendix C-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2009-102 Pocatello
Description: Existing Plus Project Weekday Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Knighton Road	I-5 SB Ramp to I-5 NB Ramp	59.8	54.0	65.3	67
2	Knighton Road	I-5 NB Ramp to Churn Creek Road	62.5	54.1	61.5	65
3	Knighton Road	Churn Creek Road to Airport Road	56.8	50.6	51.8	59
4	Churn Creek Road	Knighton Road to E. Niles Lane	58.0	50.4	50.9	59
5	Churn Creek Road	E Niles Lane to Rancho Road	58.9	51.3	51.8	60
6	Churn Creek Road	Rancho Road to I-5	63.4	55.8	56.3	65
7	I-5	Churn Creek Rd to Knighton Rd	#VALUE!	#VALUE!	#VALUE!	#VALUE!
8	I-5	Knighton road to Riverside Ave	#VALUE!	#VALUE!	#VALUE!	#VALUE!

Appendix C-3

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2009-102 Pocatello
Description: Existing Plus Project Weekday Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	-------- Distances to Traffic Noise Contours -------- 75	70	65	60	55
1	Knighton Road	I-5 SB Ramp to I-5 NB Ramp	28	59	128	275	592
2	Knighton Road	I-5 NB Ramp to Churn Creek Road	23	49	106	229	493
3	Knighton Road	Churn Creek Road to Airport Road	8	18	38	82	176
4	Churn Creek Road	Knighton Road to E. Niles Lane	9	19	42	90	195
5	Churn Creek Road	E Niles Lane to Rancho Road	10	23	49	105	225
6	Churn Creek Road	Rancho Road to I-5	21	45	96	207	446
7	I-5	Churn Creek Rd to Knighton Rd	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
8	I-5	Knighton road to Riverside Ave	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!

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Appendix F-1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 2009-102 Pocatello
Description: Cumulative Weekday No Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Knighton Road	I-5 SB Ramp to I-5 NB Ramp	7,500	85		15	2.5	10	35	100	
2	Knighton Road	I-5 NB Ramp to Churn Creek Road	11,100	85		15	1.5	2.5	35	100	
3	Knighton Road	Churn Creek Road to Airport Road	5,600	85		15	2.5	1	35	100	
4	Churn Creek Road	Knighton Road to E. Niles Lane	4,800	85		15	2.5	1	45	100	
5	Churn Creek Road	E Niles Lane to Rancho Road	5,000	85		15	2.5	1	45	100	
6	Churn Creek Road	Rancho Road to I-5	17,000	85		15	2.5	1	45	100	
7	I-5	Churn Creek Rd to Knighton Rd	79,000	76		24	1	12	65	100	
8	I-5	Knighton road to Riverside Ave	77,000	76		24	1	12	65	100	
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Appendix F-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2009-102 Pocatello
Description: Cumulative Weekday No Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Knighton Road	I-5 SB Ramp to I-5 NB Ramp	56.6	50.9	62.1	63
2	Knighton Road	I-5 NB Ramp to Churn Creek Road	58.7	50.4	57.8	62
3	Knighton Road	Churn Creek Road to Airport Road	55.8	49.6	50.8	58
4	Churn Creek Road	Knighton Road to E. Niles Lane	58.3	50.7	51.2	60
5	Churn Creek Road	E Niles Lane to Rancho Road	58.4	50.8	51.3	60
6	Churn Creek Road	Rancho Road to I-5	63.8	56.1	56.7	65
7	I-5	Churn Creek Rd to Knighton Rd	75.9	62.6	76.9	80
8	I-5	Knighton road to Riverside Ave	75.8	62.5	76.8	79

Appendix F-3

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2009-102 Pocatello
Description: Cumulative Weekday No Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	-------- Distances to Traffic Noise Contours -------- 75	70	65	60	55
1	Knighton Road	I-5 SB Ramp to I-5 NB Ramp	17	37	79	170	365
2	Knighton Road	I-5 NB Ramp to Churn Creek Road	13	28	60	129	277
3	Knighton Road	Churn Creek Road to Airport Road	7	15	33	71	152
4	Churn Creek Road	Knighton Road to E. Niles Lane	9	20	44	95	204
5	Churn Creek Road	E Niles Lane to Rancho Road	10	21	45	97	209
6	Churn Creek Road	Rancho Road to I-5	22	47	102	220	473
7	I-5	Churn Creek Rd to Knighton Rd	200	430	927	1997	4302
8	I-5	Knighton road to Riverside Ave	196	423	911	1963	4229

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Appendix G-1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 2009-102 Pocatello
Description: Cumulative Plus Project Weekday Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Knighton Road	I-5 SB Ramp to I-5 NB Ramp	17,420	85		15	2.5	10	35	100	
2	Knighton Road	I-5 NB Ramp to Churn Creek Road	30,693	85		15	1.5	2.5	35	100	
3	Knighton Road	Churn Creek Road to Airport Road	8,824	85		15	2.5	1	35	100	
4	Churn Creek Road	Knighton Road to E. Niles Lane	6,536	85		15	2.5	1	45	100	
5	Churn Creek Road	E Niles Lane to Rancho Road	6,488	85		15	2.5	1	45	100	
6	Churn Creek Road	Rancho Road to I-5	17,248	85		15	2.5	1	45	100	
7	I-5	Churn Creek Rd to Knighton Rd	NA	76		24	1	12	65	100	
8	I-5	Knighton road to Riverside Ave	NA	76		24	1	12	65	100	
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Appendix G-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2009-102 Pocatello
Description: Cumulative Plus Project Weekday Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Knighton Road	I-5 SB Ramp to I-5 NB Ramp	60.3	54.5	65.8	67
2	Knighton Road	I-5 NB Ramp to Churn Creek Road	63.2	54.8	62.2	66
3	Knighton Road	Churn Creek Road to Airport Road	57.8	51.6	52.8	60
4	Churn Creek Road	Knighton Road to E. Niles Lane	59.6	52.0	52.5	61
5	Churn Creek Road	E Niles Lane to Rancho Road	59.6	52.0	52.5	61
6	Churn Creek Road	Rancho Road to I-5	63.8	56.2	56.7	65
7	I-5	Churn Creek Rd to Knighton Rd	#VALUE!	#VALUE!	#VALUE!	#VALUE!
8	I-5	Knighton road to Riverside Ave	#VALUE!	#VALUE!	#VALUE!	#VALUE!

Appendix G-3

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2009-102 Pocatello
Description: Cumulative Plus Project Weekday Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Knighton Road	I-5 SB Ramp to I-5 NB Ramp	30	64	138	297	641
2	Knighton Road	I-5 NB Ramp to Churn Creek Road	25	55	118	253	546
3	Knighton Road	Churn Creek Road to Airport Road	10	21	44	96	206
4	Churn Creek Road	Knighton Road to E. Niles Lane	12	25	54	116	250
5	Churn Creek Road	E Niles Lane to Rancho Road	12	25	54	116	249
6	Churn Creek Road	Rancho Road to I-5	22	48	103	222	478
7	I-5	Churn Creek Rd to Knighton Rd	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
8	I-5	Knighton road to Riverside Ave	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!

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