Appendix F

Noise Technical Report

Environmental Noise Analysis

PG&E Training Facility

Winters, California

BAC Job # 2014-022

Prepared For:

Abbott & Kinderman, LLP.

Attn: Ms. Kate Hart
2100 21st Street
Sacramento, CA 95818

Prepared By:

Bollard Acoustical Consultants, Inc.

Paul Bollard, President

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BOLLARD
Acoustical Consultants

3551 Bankhead Road < Loomis, CA 95650 < Phone: (916) 663-0500 < Fax: (916) 663-0501 < BACNOISE.COM

4.9 NOISE & VIBRATION

4.9.1 INTRODUCTION

PG&E proposes to construct, operate, and maintain the Winters Gas Operations Technical Training Center (GOTTC or Project). The Winters GOTTC will provide a new location for training students in all aspects of pipeline construction, maintenance, and repair, as well as customer service.

This section describes the existing noise and vibration setting of the project site, identifies associated regulatory requirements, evaluates potential impacts, and identifies mitigation measures related to the proposed project. This section was prepared by Bollard Acoustical Consultants, Inc. (BAC) with supplemental information obtained from an assessment of project noise generation prepared by The Acoustics and Vibration Group (TAVG, January 23, 2014).

4.9.2 ENVIRONMENTAL SETTING

4.9.2.1 Noise Fundamentals and Terminology

Sound is technically described in terms of amplitude (loudness) and frequency (pitch). The standard unit of sound amplitude measurement is the decibel (dB). The decibel scale is a logarithmic scale that describes the physical intensity of the pressure vibrations that make up any sound. The pitch of the sound is related to the frequency of the pressure vibration. Since the human ear is not equally sensitive to a given sound level at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale provides this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear. All noise levels referenced in this report are A-weighted, even though denoted dB, rather than dBA.

Noise is typically defined as unwanted sound. A typical noise environment consists of a base of steady ambient noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this background noise is the sound from individual local sources, such as an occasional aircraft or train passing by to virtually continuous noise sources like traffic on a major highway. Table 4.9-1 illustrates representative noise levels in the environment.

Several rating scales have been developed to analyze the adverse effect of community noise on people. Since environmental noise fluctuates over time, these scales consider that the effects of noise upon people is largely dependent upon the total acoustical energy content of the noise, as well as the time of day when the noise occurs. Appendix A contains a listing of acoustical terminology. Definitions that are most applicable to this analysis are as follows:

- L_{eq} – The equivalent energy noise level is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.

- L_{dn} – The equivalent noise level for a continuous 24-hour period with a 10-decibel penalty imposed during nighttime and morning hours (10:00 PM to 7:00 AM).

- L_{min} – The minimum instantaneous noise level experienced during a given period of time.

- L_{max} – The maximum instantaneous noise level experienced during a given period of time.

- CNEL – The Community Noise Equivalent Level is a 24-hour average L_{eq} with a 10 dB "penalty" added to noise during the hours of 10:00 P.M. to 7:00 A.M., and an additional 5 dB penalty during the hours of 7:00 P.M. to 10:00 P.M. to account for noise sensitivity in the evening and nighttime. The logarithmic effect of these additions is that a 60 dB 24-hour L_{eq} would result in a measurement of 66.7 dB CNEL.

Noise environments and consequences of human activities are usually well represented by median noise levels during the day, night, or over a 24-hour period. Environmental noise levels are generally considered low when the CNEL is below 60 dBA, moderate in the 60–70 dB range, and high above 70 dBA. Noise levels greater than 85 dB can cause temporary or permanent hearing loss. Examples of low daytime levels are isolated, natural settings with noise levels as low as 20 dB and quiet suburban residential streets with noise levels around 40 dBA. Noise levels above 45 dB at night can disrupt sleep. Examples of moderate level noise environments are urban residential or semi-commercial areas (typically 55–60 dBA) and commercial locations (typically 60 dBA).

When evaluating changes in 24-hour community noise levels, a difference of 3 dB is a barely perceptible increase to most people. A 5 dB increase is readily noticeable, while a difference of 10 dB would be perceived as a doubling of loudness.

Noise levels from a particular source decline as distance to the receptor increases. Other factors, such as the weather and reflecting or shielding, also help intensify or reduce the noise level at any given location. A commonly used rule of thumb for roadway noise is that for every doubling of distance from the source, the noise level is reduced by about 3 dB at acoustically "hard" locations (i.e., the area between the noise source and the receptor is nearly complete asphalt, concrete, hard-packed soil, or other solid materials) and 4.5 dB at acoustically "soft" locations (i.e., the area between the source and receptor is earth or has vegetation, including grass). Noise from stationary or point sources is reduced by about 6 to 7.5 dB for every doubling of distance at acoustically hard and soft locations, respectively. Noise levels may also be reduced by intervening structures; generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm reduces noise levels by 5 to 10 dBA. The manner in which older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dB with closed windows. The exterior-to-interior reduction of newer homes is generally 25 to 30 dBA.

Table 4.9-1
Typical Noise Levels in the Environment

Common Outdoor Noise Source	Noise Level (dBA)	Common Indoor Noise Source
	110 dBA	Rock band
Jet fly-over at 1,000 feet	100 dBA	
Gas lawn mower at 3 feet	90 dBA	
Diesel truck at 50 feet at 50 mph		Food blender
	80 dBA	Garbage disposal
Noisy urban area, daytime		
Gas lawn mower at 30 feet	70 dBA	Vacuum cleaner
Commercial area		Normal speech face to face
Heavy traffic at 300 feet	60 dBA	
		Large business office
Quiet urban daytime	50 dBA	Dishwasher in next room
Quiet urban nighttime	40 dBA	Theater, large conference room
Quiet suburban nighttime		
	30 dBA	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20 dBA	
		Broadcast/recording studio
	10 dBA	
	0 dBA	
Source: Technical Noise Supplement (TeNS), Caltrans, November 2009		

4.9.2.2 Vibration Fundamentals and Terminology

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 noise is generally considered to be pressure waves transmitted through air, while vibration is usually associated with transmission through the ground or structures. As with noise, vibration consists of an amplitude and frequency. A person's response to vibration will depend on their individual sensitivity as well as the amplitude and frequency of the source.

Vibration can be described in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities (inches/second). Standards pertaining to perception as well as damage to structures have been developed for vibration in terms of peak particle velocity.

According to the Transportation and Construction-Induced Vibration Guidance Manual (Caltrans, June 2004), operation of construction equipment and construction techniques generate ground vibration. At high enough amplitudes, ground vibration has the potential to damage structures and/or cause cosmetic damage (e.g., crack plaster). Ground vibration can also be a source of annoyance to individuals who live or work close to vibration-generating activities.

As vibrations travel outward from the source, they excite the particles of rock and soil through which they pass and cause them to oscillate. Differences in subsurface geologic conditions and distance from the source of vibration will result in different vibration levels characterized by different frequencies and intensities. In all cases, vibration amplitudes will decrease with increasing distance. The maximum rate or velocity of particle movement is the commonly accepted descriptor of the vibration "strength."

Human response to vibration is difficult to quantify. Vibration can be felt or heard well below the levels that produce any damage to structures. The duration of the event has an effect on human response, as does frequency. Generally, as the duration and vibration frequency increase, the potential for adverse human response increases. Table 4.9-2 summarizes the average human response to vibration that may be anticipated when a person is at rest in quiet surroundings. If the person is engaged in any type of physical activity, the level required for the responses indicated is increased considerably.

Table 4.9-2
Human Response to Ground Vibration

Response	Ground Vibration Range ppv (inches per second)
Barely to distinctly perceptible	0.02–0.10
Distinctly perceptible to strongly perceptible	0.10–0.50
Strongly perceptible to mildly unpleasant	0.50–1.00
Mildly unpleasant to distinctly unpleasant	1.00–2.00
Distinctly unpleasant to intolerable	2.00–10.00
Source: Caltrans 2004.	

4.9.2.3 Description of Project Site & Surrounding Area

The Project site consists of approximately 38 acres of primarily open agricultural land located on East Grant Avenue (SR 128) at the SW corner of I-505 in the City of Winters, California. Of the approximately 38 acres, the southern-most 3.75 acres would be dedicated for open space uses along Putah Creek, and the western-most 4 acres would be dedicated to the City and developed as a regional drainage channel along the western boundary of the Project development area.

The site is bordered on the north by East Grant Avenue (SR 128), beyond which are two existing residences, commercial uses (gas station/mini mart) and agricultural land, to the south by Putah Creek, beyond which are agricultural lands, to the east by I-505 and an industrial use further east, and to the west by an existing single-family residential development, including the McClish houses and a vacant lot, and the McClish Remainder parcels. The project site is bordered by Putah Creek to the south, beyond which are agricultural lands. These residences, as well as the users of the Putah Creek Parkway trails, constitute the nearest noise-sensitive receptors to the project site. The distances from the 19 project-related noise sources located in 11 discrete areas of the project site to these nearest receptors varies from 200 to over 2,200 feet. Wildlife in the Putah Creek area is also recognized as having varying degrees of sensitivity to noise but this analysis assumes that satisfaction of the City's noise criteria for humans would provide adequate protection to wildlife. As a result, impacts upon trail users of the Putah Creek are evaluated in this section but impacts to wildlife are not separately addressed. The site is bordered to the east by Interstate 505.

The Project site is comprised of multiple parcels, which are generally known as the McClish and Jordan properties. The McClish property is currently designated by the Winters General Plan as Business/Industrial Park (BIP) and the Jordan property is currently designated Highway Service Commercial (HSC). The McClish property is zoned Business/Industrial Park with a Planned Development Overlay (BIP/PD) and the Jordan property is zoned Highway Service Commercial with a Planned Development Overlay (C-H/PD). The applicant proposes redesignation and rezoning of each of the proposed parcels to Public Quasi Public or PQP with text amendments

required to the Zoning Code to allow vocational training facilities within the PQP zone district by conditional use permit.

4.9.2.4 Existing General Ambient Noise Environment in the Project Vicinity

The project area noise environment is defined primarily by noise from traffic on I-505 and SR 128. The nearest residences to the west of the project site are also influenced by neighborhood noises, including local traffic, yard maintenance, periodic barking dogs, etc.

To quantify existing ambient noise conditions in the immediate project vicinity, a long-term (72-hour) noise monitoring program was conducted at four locations on the projects site. Those locations, which are identified on Figure 4.9-1, represent locations near all four project borders. The continuous noise monitoring survey covered the period of Friday, January 31 through Sunday, February 2, 2014.

Weather conditions present during the monitoring program were typical for the season, with cool morning temperatures, variable skies, high relative humidity, and calm to moderate winds. There were no adverse conditions which would have resulted in anomalies in the ambient noise survey results.

Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meters were used for the noise level measurement survey. The meters were calibrated before and after use with an LDL Model CAL200 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). The numerical summaries of the ambient noise level measurements are provided in Table 4.9-3. Complete graphs of the ambient noise level results are provided in Appendix B. Appendix C shows noise photographs of ambient noise measurement locations.

Table 4.9-3
Ambient Noise Monitoring Results – GOTTC Vicinity – January 31 – February 2, 2014

Site – P/L	Date	Day of Week	Daytime Leq[1]	Daytime Lmax	L_{dn}, dBA
1 – West	1-31-14	Friday	50	58-70	55
	2-1-14	Saturday	50	57-79	54
	2-2-14	Sunday	51	57-71	54
2 – North	1-31-14	Friday	69	78-87	72
	2-1-14	Saturday	69	77-95	71
	2-2-14	Sunday	69	79-86	70
3 – East	1-31-14	Friday	54	60-81	59
	2-1-14	Saturday	55	62-81	58
	2-2-14	Sunday	56	59-70	60
4 - South	1-31-14	Friday	53	59-78	59
	2-1-14	Saturday	53	60-76	58
	2-2-14	Sunday	54	57-72	60

Source: Bollard Acoustical Consultants 2013
1. The daytime Leq is the average noise level for the entire daytime period of 7 am to 10 pm.

4.9.2.5 Existing Traffic Noise Environment in the Project Vicinity

The local roadways which will primarily be utilized by project traffic include East Grant Avenue/Russell Boulevard (SR128) and Interstate 505. The Federal Highway Administration Highway Traffic Noise Prediction Model was used to predict baseline traffic noise exposure along SR 128. Traffic volumes in the form of AM and PM peak hour turning movements were obtained from the project traffic study. To obtain daily segment volumes, the AM and PM peak hour volumes were averaged and multiplied by 10. Other FHWA Model inputs, including heavy truck percentages, day/night distribution of traffic, and vehicle speeds were obtained from published Caltrans Truck Classification Counts (http://traffic-counts.dot.ca.gov/), BAC 24-hour noise measurement data, and observed traffic speeds. Appendix D-1 contains the baseline traffic noise modeling assumptions. The modeled existing traffic noise levels along the local roadways are provided in Table 4.9-4.

Table 4.9-4
Baseline SR-128 Traffic Noise Levels

Segment	Segment Description	Baseline Ldn @ 100 feet from C/L	Distance to 60 dB Ldn Contours
1	West of E Main St.	64.9	212
2	E Main St. - Timber Crest Rd.	65.2	221
3	Timber Crest Rd. - Co. Rd. 90	65.2	221
4	Co. Rd. 90 - I-505 SB Ramps	65.2	222
5	I-505 SB Ramps - I-505 NB Ramps	64.2	192
6	East of I-505 NB Ramps	63.1	160
Source: FHWA-RD-77-108 with inputs shown in Appendix D-1.			

The Table 4.9-4 data indicate that existing traffic noise levels along SR-128 range from 63 to 65 dB L_{dn} at a standardized distance of 100 feet from the roadway centerline. After adjusting the ambient noise measurement results at measurement site #2 in Table 4.9-3 from the measurement distance of 50 feet to the reference distance of 100 feet (-5 dB), those measurement data show very good agreement with the levels predicted in Table 4.9-4.

4.9.2.6 Existing Ambient Vibration Environment

No appreciable sources of vibration were identified either on the project site or on neighboring properties during BAC field surveys of the area. Existing ambient vibration levels were subjectively evaluated as being below the threshold of perception. Nonetheless, to quantify baseline vibration levels in the immediate project vicinity, BAC conducted ambient vibration measurements in terms of peak particle velocities (PPV), on January 30, 2014. The vibration measurements were conducted at the same four locations at the long-term ambient noise monitoring sites. Those locations are identified on Figure 4.9-1.

The vibration measurements were conducted using a Larson-Davis Laboratories Model HVM-100 Vibration Analyzer with a PCB Electronics Model 353B51 ICP Vibration Transducer. The test system is a Type I instrument designed for use in assessing vibration as perceived by humans, and meets the full requirements of ISO 8041:1990(E). Atmospheric conditions present during the tests were within the operating parameters of the instrument. Photographs of the vibration measurement equipment are provided in Appendix C. A summary of the vibration measurement results is provided in Table 4.9-5.

Table 4.9-5
Measured Ambient Vibration Levels – PG&E Training Facility – January 30, 2014

Site[1]	Time	Peak Particle Velocity (In/Sec)
1	2:06 pm	0.0038
2	2:25 pm	0.0147
3	2:43 pm	0.0107
4	2:59 pm	0.0040

1. Vibration measurement locations are shown on Figure 4.9-1

Source: Bollard Acoustical Consultants, Inc. (BAC)

4.9.3 REGULATORY SETTING

4.9.3.1 Federal

There are no federal standards that are applicable to the proposed project.

4.9.3.2 State

Government Code Section 65302

Each planning agency shall prepare and the legislative body of each county and city shall adopt a comprehensive, long-term general plan for the physical development of the county or city, and of any land outside its boundaries which in the planning agency's judgment bears relation to its planning. Chartered cities shall adopt general plans which contain the mandatory elements specified in Section 65302.

(f) (1) A noise element that shall identify and appraise noise problems in the community. The noise element shall recognize the guidelines established by the Office of Noise Control and shall analyze and quantify, to the extent practicable, as determined by the legislative body, current and projected noise levels for all of the following sources:

(A) Highways and freeways.

(B) Primary arterials and major local streets.

(C) Passenger and freight online railroad operations and ground rapid transit systems.

(D) Commercial, general aviation, heliport, helistop, and military airport operations, aircraft overflights, jet engine test stands, and all other ground facilities and maintenance functions related to airport operation.

(E) Local industrial plants, including, but not limited to, railroad classification yards.

(F) Other ground stationary noise sources, including, but not limited to, military installations, identified by local agencies as contributing to the community noise environment.

(2) Noise contours shall be shown for all of these sources and stated in terms of community noise equivalent level (CNEL) or day-night average level (L_{dn}). The noise contours shall be prepared on the basis of noise monitoring or following generally accepted noise modeling techniques for the various sources identified in paragraphs (1) to (6), inclusive.

(3) The noise contours shall be used as a guide for establishing a pattern of land uses in the land use element that minimizes the exposure of community residents to excessive noise.

(4) The noise element shall include implementation measures and possible solutions that address existing and foreseeable noise problems, if any. The adopted noise element shall serve as a guideline for compliance with the state's noise insulation standards.

Pursuant to this State requirement, the City of Winters has adopted a General Plan Noise Element which contains policies with respect to acceptable noise exposure in the City. The City's Noise Element is presented under the "Local" regulation section of this report.

California Department of Transportation

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. The Caltrans publication, *Transportation-and Construction-Induced Vibration Guidance Manual*, June 2004, provides guidelines for acceptable vibration limits for transportation and construction projects in terms of the induced peak particle velocity (PPV). Those standards are reproduced in Table 4.9-6. Although the Table 4.9-6 criteria are not necessarily applicable to this project they are considered in this analysis because they relate to human response to various vibration levels as well as potential damage to residential structures.

Table 4.9-6
Vibration Criteria

Response	Ground Vibration Range ppv (inches per second)
Barely to distinctly perceptible	0.02–0.10
Distinctly perceptible to strongly perceptible	0.10–0.50
Strongly perceptible to mildly unpleasant	0.50–1.00
Mildly unpleasant to distinctly unpleasant	1.00–2.00
Distinctly unpleasant to intolerable	2.00–10.00
Threshold for damage to older buildings	0.5
Threshold for damage to newer residences	1.0
Source: Caltrans 2004.	

4.9.3.3 Local

City of Winters General Plan

The Goals and Policies of the City of Winters General Plan Health and Safety Element which pertain to noise and/or vibration and are relevant to the project are presented below:

Goal VII.E: To protect city residents from the harmful and undesirable effects of excessive noise.

Policies:

VII.E.1. The City shall evaluate the compatibility of various land uses with nearby noise sources based on the standards in Table II-3. (Note: This table is reprinted as Table 4.9-7 herein)

VII.E.4. Non-transportation noise sources which are potentially intrusive shall be evaluated in terms of the noise level limits in Tables II-4 and II-5. In applying these limits, the corrections in Table II-6 shall be added to account for the nature of the noise. (Note: These tables are included as Tables 4.9-8, 4.9-9 and 4.9-10 respectively).

VII.E.6. Any project that would cause existing traffic-related noise levels in existing residential areas to increase more than 3 dB shall be required to evaluate the feasibility of noise mitigation measures.

VII.E.7. The City may also require preparation of a noise study when L_{dn} standards are met or inapplicable, but 1) a potentially intrusive noise source is proposed near a noise sensitive area, or 2) a noise sensitive land use is proposed near a potentially intrusive noise source.

VII.E.8. Required noise studies shall be the responsibility of the project applicant, and shall be consistent with the state guidelines for noise study reports. Such studies shall be performed by a qualified consultant and shall include the following:

a) A summary of noise data collected, and/or descriptions of the methodologies used to determine existing and expected noise levels and noise descriptors such as L_{eq} or L_{dn}.

b) Figures or maps showing the locations of noise sources and noise sensitive areas.

c) A description of the impacts of existing and future (20 years hence) noise levels on the project and/or impacts due to the project on the surrounding area. The standards in this section of the *General Plan Policy Document* shall form the basis for impact assessment.

d) Specifications of any noise mitigation measures recommended to ensure compliance with the standards in this *General Plan Policy Document*.

e) Description of the expected effects of the mitigation measures.

VII.E.9. The City shall encourage county, state, and federal agencies to actively enforce regulations dealing with noise.

VII.E.10. Vehicles and other equipment operated by or on behalf of the City shall comply with all applicable noise performance standards. Noise emission shall be a consideration in the purchase of any new equipment or vehicles.

VII.E.11. The City shall encourage development designers to minimize noise levels through such measures as the following:

a) Locating outdoor activity spaces such as yards, patios, and decks in areas where noise levels are low.

b) Locating and orienting buildings to place noise sensitive indoor spaces such as living rooms and bedrooms in areas with low noise levels.

c) Locating relatively non-noise sensitive structures such as commercial buildings to shield noise sensitive areas such as residences and care facilities from noise sources.

d) Using berms, walls, and setbacks to shield noise sensitive areas from noise sources. Walls shall only be used as a last resort.

e) Provide appropriate muffling devices or enclosures for new noise sources located near noise sensitive areas.

VII.E.12. Deviations from City noise standards may be approved only in extreme and/or unusual circumstances.

Table 4.9-7
Land Use Compatibility Standards (Winters General Plan Table II-3)

Land Use Category	Exterior Ldn (dBA)			
	60 or Less	60-65	65-70	70-75
Residential Single and multiple family dwellings, including mobile homes, duplexes, apartments, condominiums, hotels and motels	+	o	-	--
Outdoor Public Facilities Neighborhood parks, playgrounds (including school playgrounds), picnic areas, amphitheaters, golf courses, riding stables and trails, water recreation, cemeteries	+	o	-	--
Public Buildings School buildings, libraries, churches, hospitals, nursing homes, auditoriums, concert halls, sports arenas	++	+	o	-
Commercial Office Buildings, retail, business and professional facilities	++	+	o	-
Industrial Manufacturing, utilities, and agriculture facilities	++	++	+	o

Symbols

++ Clearly Acceptable. The activities-associated with the specified uses can be carried out with virtually no interference from noise.

+ Normally Acceptable - Little interference with outdoor activities is expected. Conventional-structures will insure that interior Ldn values are compatible with indoor activities.

o Conditionally Acceptable - The indicated noise levels will cause moderate interference with outdoor activities, and with indoor activities when windows are open. New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made. Noise reduction features should be included in the project design which upgrade the environment to the Normally Acceptable" category over a substantial portion of the project site.

- Normally Unacceptable - Noise will create substantial interference with both outdoor and indoor activities. Noise intrusion on indoor activities can be mitigated with special noise insulating construction. New construction or development should be generally discouraged. If construction or development does proceed, noise mitigation measures should be required to upgrade the acoustic environment to approach the "Normally Acceptable" category with respect to exterior noise, and to insure that interior noise levels comply with the state noise insulation standards.

- - Clearly Unacceptable - Unacceptable noise intrusion upon land use activities will occur. Adequate structural noise insulation may not be practical in many cases, or may involve high noise barriers visually incompatible with a suburban area. New construction or development should generally not be undertaken.

Source: Winters General Plan Policy Document, Table II-3, page II-60.

Table 4.9-8
Exterior Noise Level Limits (Winters General Plan Table II-4)

	Exterior Limit in dBA	
	Daytime	Nighttime
Use Zone	**7 a.m. – 10 p.m.**	**10 p.m. – 7 a.m.**
Rural (OS)	50	40
Residential (R-1, R-2, R-3, R-4)	50	45
Parks & Recreation (P-R)	50	45
Commercial (C-1, C-2, NC, CH, CS)	63	45
Manufacturing/Industrial (M-1, M-2, PI)	73	70

These limits on intrusive noise are to be applied at any point within the boundaries of a property zoned as indicated.

Each limit is the noise level which is not to be exceeded continuously during any five minute period. If the noise level varies above and below the limit, the limit shall not be exceeded during more than one time interval in any five minute period. Noise levels higher than the applicable limit plus 15 dB are prohibited at all times.

Source: Winters General Plan Policy Document, Table II-4, page II-61.

Table 4.9-9
Interior Noise Level Limits (Winters General Plan Table II-5)

	Interior Limit in dBA	
	Daytime	Nighttime
Use Zone	**7 a.m. – 10 p.m.**	**10 p.m. – 7 a.m.**
Residential (R-1, R-2, R-3, R-4)	45	35

These levels of intrusive noise are not to be exceeded at any point within a dwelling.

Each limit is the noise level which is not to be exceeded continuously during any five minute period. If the noise level varies above and below the limit, the limit shall not be exceeded during more than one time interval in any five minute period. Noise levels higher than the applicable limit plus 15 dB are prohibited at all times.

Source: Winters General Plan Policy Document, Table II-5, page II-61.

Table 4.9-10
Corrections to Noise Levels Due to Potentially Intrusive Non-Transportation Noise Sources (Winters General Plan Table II-6)

Type of Correction	Circumstances Under Which the Correction is Applicable	Correction to be added to The Measured or Predicted Noise Level Due to a Potentially Intrusive Noise Source (dBA)
Seasonal Corrections	Summer (or year-round operation)	0
	Winter only (or windows always closed)	-5
Corrections for Character of Noise	No tonal, impulsive, or information content	0
	Tonal components present	+5
	Impulsive Noise	+5
	Information content (e.g., speech, song lyrics)	+5
Correction for Previous Exposure and Community Attitudes	No prior experience with the subject noise	0
	Some previous exposure to subject noise, but little effort made to control noise.	0
	No previous exposure, but community is aware that serious noise control efforts are being made.	0
	Considerable previous exposure to subject noise and noise maker has good relations with community.	-5
	Community is aware that the subject noise source is very necessary, and will not operate indefinitely.	-10
These corrections are to be used in conjunction with the standards specified in Policy VII.E.4 Source: Winters General Plan Policy Document, Table II-6, page II-62.		

City of Winters Noise Ordinance

Chapter 8.20 of the City of Winters Municipal Code pertains to noise. The pertinent sections of that Code are presented below:

Section 8.20.060 General noise regulations and factors.

Notwithstanding any other provision of this chapter, and in addition thereto, it shall be unlawful for any person to willfully or negligently make or continue, or cause to be made or continued, any loud, unnecessary, or unusual noise which disturbs the peace and quiet of any neighborhood or which causes discomfort or annoyance to any reasonable person of normal sensitiveness residing in the area.

The factors which shall be considered by the noise control office in determining whether a violation of the provisions of this chapter exists shall include, but not be limited to, the following:

A. The sound level of the objectionable noise;

B. The sound level of the ambient noise;

C. The proximity of the noise to residential sleeping facilities;

D. The nature and zoning of the area within which the noise emanates, and the area affected by the noise;

E. The number of the persons affected by the noise source;

F. The time of day or night the noise occurs;

G. The duration of the noise and its tonal, informational, or musical content;

H. Whether the noise is continuous, recurrent, or intermittent.

Section 8.20.070 Noise measurement procedure.

The measurement procedure presented below assumes that personnel performing the noise measurements have been trained in the use of the instruments and in the interpretation of measured data.

Upon receipt of a complaint from a citizen, the noise control office representative, equipped with sound level measurement equipment satisfying the requirements specified in 6-7.04(ff), may investigate the complaint. Any investigation shall consist of a measurement and the gathering of data to adequately define the noise problem (as indicated in Section 8.20.030 "Sound level meter") and shall include the following:

A. Non-acoustic data.

1. Type of noise source;

2. Location and zoning of noise source relative to complainant's property;

3. Time period during which noise source is considered by complainant to be intrusive;

4. Total duration of noise produced by noise source;

5. Date and time of noise measurement survey.

B. Utilizing the A weighting scale of the sound level meter and the slow meter response (use fast response for impulsive type sounds), the noise level shall be measured at a position or positions at any point on the receivers property.

In general, the microphone shall be located four to five feet above the ground; ten (10) feet or more from the nearest reflective surface, where possible. However, in those cases where another elevation is deemed appropriate, the later shall be utilized. If the noise complaint is related to interior noise levels, interior noise measurements shall be made within the affected residential unit. The measurements shall be made at a point at least four feet from the wall, ceiling, or floor nearest the noise source, with doors and windows closed. Calibration of the measurement equipment, utilizing acoustic calibrator, shall be performed immediately prior to recording any noise data. (Ord. 89-04 (part): prior code § 6-7.08)

Section 8.20.080 Exterior noise limits.

A. Maximum permissible sound levels by receiving land use.

1. The exterior noise standards for the various categories of land uses identified by the noise control office as presented in Table 4.9-11 shall, unless otherwise specifically indicated, apply to all such property within a designated zone. No person shall allow creation of any noise which exceeds the standards.

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

B. Correction for character of sound.

In the event the alleged offensive noise, as judged by the noise control officer, contains a steady, audible tone such as whine, screech, or hum, or is a repetitive noise such as hammering or riveting, or contains music or speech conveying informational content, the standard exterior noise limits set forth in Table 4.9-11 shall be reduced by five db.

Table 4.9-11
Exterior Noise Level Limits

	Exterior Limit in dBA	
	Daytime	**Nighttime**
Type of Zone	**7 a.m. – 10 p.m.**	**10 p.m. – 7 a.m.**
Rural (OS)	50	40
Residential	50	45
Parks & Recreation (P-R)	50	45
Commercial (C-1, C-2, NC, CH, CS)	63	45
Manufacturing/Industrial (M-1, M-2, PI)	73	70

These noise level limits in dB are not to be exceeded continuously during any five-minute period of, if the noise level varies above and below the limit, for more than one time interval during any five-minute period.

These noise levels are not to be exceeded at any point within the boundaries of a property zone as indicated. (Ord. 2003-04 § 16 (part); Ord. 89-04 (part): prior code § 6-7.09)

8.20.090 Interior noise limits.

A. Maximum permissible dwelling interior sound levels.

The interior noise standards for residential dwellings as presented in Table 4.9-12 shall apply, unless otherwise specifically indicated, within all such dwellings, with doors and windows closed. No person shall allow creation of any noise which exceeds the standards.

Table 4.9-12
Interior Noise Level Limits

Type of Zone	Time Interval	Allowable Interior Noise Level (dBA)
Any residential zone	7 a.m. – 7 p.m.	45
	7 p.m. – 10 p.m.	45
	10 p.m. – 7 a.m.	35

These noise level limits in dB are not to be exceeded continuously during any five minute period or, if the noise level varies above and below the limit for more than one time interval during any five-minute period.

B. Correction for character of sound.

In the event the alleged offensive noise, as judged by the noise control office, contains a steady, audible tone such as a whine, screech, or hum, or is a repetitive noise such as hammering or riveting, or contains music or speech conveying informational content, the standard limits set forth in Table 4.9-12 shall be reduced by five dB. (Ord. 89-04 (part): prior code § 6- 7.10)

Section 8.20.100 Prohibited Acts

B. Specific Prohibitions

6. Construction/Demolition

a. Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration, or demolition work between weekday hours of seven p.m. and seven a.m. or at any time on Sundays, weekends, or holidays, such that the sound therefrom creates a noise disturbance across a residential or commercial real property line, except for emergency work of public service utilities or by variance granted by the planning commission.

b. Noise Restrictions at Affected Properties. Where technologically and economically feasible, construction and demolition activities shall be conducted in such a manner that the maximum noise levels at affected properties shall not

exceed ninety (90) dB measured at a distance of a least fifty (50) feet (fifteen (15) meters) from any single machine or vehicle between the hours of seven a.m. and seven p.m. weekdays. Sundays and holidays shall be subject to the exterior noise level standards as set forth in Table 4.9-11 (Section 8.20.080);

7. Vibration

   Operating or permitting the operation of any device that creates a vibration which is above the vibration perception threshold of an individual at or beyond the property boundary of the source if on private property or at one hundred fifty (15) feet (forty-six (46) meters) form the source if on a public space or public right-of-way.

4.9.4 IMPACTS AND MITIGATION MEASURES

4.9.4.1 Standards of Significance

The following standards of significance, which are based on the California Environmental Quality Act Guidelines (State CEQA Guidelines) in conjunction with interpretation of adopted local noise policy and appropriate noise standards as described above, are applied to this project. NOTE: This project is not located within an airport land use plan or within two miles of a public airport or private airstrip. Accordingly, no analysis of exposure of people within the project is required and is scoped out of this discussion.

A. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

1. For assessing impacts of the external noise environment upon the proposed project, the Land Use Compatibility Standards shown in Table 4.9-7 are utilized. Specifically, the proposed classroom facilities, which are noise-sensitive, would be subject to the "Public Buildings" standards (normally acceptable below 65 dB L_{dn} and conditionally acceptable below 70 dB L_{dn}). The outdoor training areas, which are noise-generating, would be subject to the "Industrial" standards (normally acceptable below 70 dB L_{dn}). Impacts at the adjacent Business Industrial Park (BIP) parcel to the west are assessed relative to the City's General Plan Noise Element standards applicable to commercial uses. Specifically, commercial uses, including office buildings, retail, business and professional uses, are considered normally acceptable in exterior environments up to 65 dB L_{dn}, and conditionally acceptable in exterior noise environments up to 70 dB L_{dn}.

2. For assessing impacts of noise generated by on-site activities at exterior areas of existing noise-sensitive land uses (i.e. residential outdoor activity areas and the Putah Creek open space), the noise standards of Tables 4.9-8 (General Plan), and 4.9-11 (Noise Ordinance), are used. For assessing impacts at the existing

commercial and industrial uses to the north and east, the standards of Table 4.9-8 and 4.9-11 are also used. Although the numeric standards contained in these tables are identical, the application of these standards requires interpretation. Specifically, adjustments to the standards where two different zoning districts abut, for character of noise, for seasonal variations, and for previous exposure and community attitudes are not consistent between the General Plan and Noise Ordinance. In addition, the noise level descriptor and time interval to be monitored for compliance are not defined.

For the purposes of assessing noise impacts associated with this project, the City of Winters noise standards have been interpreted as follows:

a. Although the zoning of the project site and neighboring noise-sensitive areas differ, the more conservative General Plan standards are used to assess impacts for this study, rather than the Noise Ordinance standard which applies the noise standard applicable to the quieter land use plus 5 dB.

b. The noise standards of Tables 4.9-10 and 4.9-12 are logically assumed to represent hourly average noise levels (L_{eq}), because they are consistent with similar L_{eq} standards of many California cities and counties. In addition, the magnitude of those standards is such that it is unrealistic that the daytime residential standard of 50 is a maximum standard because it would be unduly restrictive and virtually every noise source within the City of Winters would exceed such a low maximum noise standard.

c. The specific daytime noise standard applied to this project is 50 dB L_{eq} at both the nearby residential land uses and open space areas (Putah Creek). Because no nighttime (10 pm – 7 am) operations are proposed at the project site, the City's nighttime noise standards would not apply.

d. For on-site noise sources containing a steady, audible tone such as whine, screech, or hum, or is a repetitive noise such as hammering or riveting, or contains music or speech conveying informational content, the exterior noise limits are reduced by 5 dB. For this project, such sources include back-up beepers on mobile equipment and jack hammers. The hourly average noise level standard applied to these sources is 45 dB L_{eq}.

e. According to City's Noise Element and Ordinance, Maximum (L_{max}) noise standards shall not exceed the average noise level limits by more than 15 dB at any time. For this analysis, the maximum noise level standard applicable to the nearest residences is 65 dB L_{max}. For the tonal and impulsive noise

sources (back up beepers, impact wrenches, and jack hammers), the maximum noise level limit at the nearest residences and Putah Creek open space is 60 dB L_{max}.

f. Provided the aforementioned exterior noise level standards are satisfied by the project, the project would also be in compliance with the City's interior noise level standards. This is because the noise reduction provided by the existing residential structures is adequate to ensure that interior noise levels would be acceptable provided the exterior noise environment is mitigated to acceptable levels. As a result, this impact analysis focuses on exterior noise exposure at the nearby residential and open space land uses.

3. For assessing impacts of project-generated traffic noise upon existing residences located near SR 128, the Land Use Compatibility Standards shown in Table 4.9-7 are utilized. Specifically, if project-generated traffic results in exterior noise exposure in excess of 60 dB L_{dn} at existing residences located along SR-128, a significant noise impact is identified.

B. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

1. The City's Noise Ordinance (Section 8.20.100.B.7) states that vibration levels shall be held below the threshold of perception at sensitive locations. The vibration criteria shown in Table 4.9-6 indicate that threshold of perception is 0.1 in/sec peak particle velocity. As a result, the standard used to assess vibration impacts in this section is 0.1 in/sec ppv.

C. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

1. Substantial increases are defined using the 3 dB threshold identified in General Plan Noise Element Policy VII.E.6.

   The ambient noise monitoring results shown in Table 4.9-3 also indicate that average daytime noise levels at the nearest residences to the west were approximately 50-51 dB L_{eq}. After applying the 3 dB over ambient threshold to those ambient conditions, the resulting daytime noise standard at those residences would be 53-54 dB L_{eq}, which is consistent with noise standards described above for threshold A.

   While CEQA requires that noise impacts be assessed relative to ambient noise levels that are present without the project, it should be noted that audibility is not a test of significance according to CEQA. If this were the case, any project that added any audible amount of noise to the environment would be considered an adverse impact

according to CEQA. CEQA requires a *substantial* increase in noise levels before noise impacts are identified, not simply an audible change. As noted previously, the City of Winters General Plan Policy VII.E.6 identifies 3 dB as the threshold at which project-related noise impacts are identified.

D. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above level existing without the project.

1. The ambient noise monitoring results shown in Table 4.9-3 also indicate that average daytime noise levels at the nearest residences to the west were approximately 50-51 dB L_{eq}. After applying the 3 dB over ambient threshold to those ambient conditions, the resulting daytime noise standard at those residences would be 53-54 dB L_{eq}, which is consistent with noise standards described above for threshold A.

   While CEQA requires that noise impacts be assessed relative to ambient noise levels that are present without the project, it should be noted that audibility is not a test of significance according to CEQA. If this were the case, any project that added any audible amount of noise to the environment would be considered an adverse impact according to CEQA. CEQA requires a *substantial* increase in noise levels before noise impacts are identified, not simply an audible change.

2. As presented above, City Noise Ordinance Section 8.20.100.B.6 recognizes that short-term construction activities generate elevated noise levels. Pursuant to the provisions of that Section, provided the temporary increases in noise generated by project construction are limited to weekday hours of 7 am to 7 pm (with no weekend or holiday construction), and provided maximum noise levels resulting from project construction do not exceed 90 dB at a distance of 50 feet during those hours, noise impacts associated with short-term increases in ambient noise levels due to project construction shall be considered less than significant. In light of this City policy, the criteria applied to short-term construction noise is 90 dB at a distance of 50 feet.

4.9.4.2 Methodology

A combination of noise and vibration level measurements, use of reference noise and vibration levels, and application of accepted noise and vibration prediction methodologies was utilized to predict noise and vibration impacts resulting from construction and/or operation of the proposed project.

4.9.4.4 Project-Specific Noise and Vibration Impacts and Mitigation

Impact 4.9-1

Project-generated traffic could result in permanent increases in traffic noise levels in the project vicinity. This is considered to be a less than significant impact (LTS).

The Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model was used to predict project-generated traffic noise exposure along SR 128. Traffic volumes in the form of AM and PM peak hour turning movements were obtained from the project traffic study. To obtain daily segment volumes, the AM and PM peak hour volumes were averaged and multiplied by 10. Other FHWA Model inputs, including heavy truck percentages, day/night distribution of traffic, and vehicle speeds were obtained from published Caltrans Truck Classification Counts (http://traffic-counts.dot.ca.gov/), BAC 24-hour noise measurement data, and observed traffic speeds. Appendix D contains the traffic noise modeling assumptions for all project scenarios. Unlike stationary noise sources, for which sound decays due to spherical spreading at a rate of 6 dB per doubling of distance from the source, traffic noise generally decays at a rate of 4.5 dB per doubling of distance from the noise source. This is because the traffic noise source appears as a moving point to the receiver, rather than a stationary point. The modeled existing and future, project and no-project, traffic noise levels along SR 128 are provided in Table 4.9-13.

Because Interstate 505 currently carries approximately 21,000 daily vehicles south of SR 128 and approximately 17,000 vehicles north of SR 128, the addition of low project traffic to that roadway will not result in an audible increase in traffic noise on that roadway. More specifically, the project would need to create a doubling of traffic on I-505 in order to result in the 3 dB increase in traffic noise levels considered significant relative to the City of Winters General Plan Noise Element. Because the project traffic generation is predicted to be less than 2,000 daily vehicles on I-505, a 3 dB increase in I-505 traffic noise would not result from the project. Therefore, a more detailed analysis of changes to I-505 traffic noise levels was not warranted for this project as the project related increase on that roadway is predicted to be less than significant.

Impact 4.9-2

Users of the facility could be exposed to traffic noise levels from State Route 128 and Interstate 505 in excess of standards established in the general plan or noise ordinance. This is considered to be a less than significant impact (LTS).

The nearest noise-sensitive area on the project site to SR 128 is the proposed learning center building. This building is proposed to be located approximately 400 feet from the SR 128 centerline. Extrapolation of the Table 4.9-13 traffic noise levels to that 400-foot distance using an attenuation rate of 4.5 dB per doubling of distance from the roadway results in a future exterior noise level of 61 dB L_{dn}. Although an attenuation rate of 6 dB per doubling of distance is used to predict propagation of stationary noise sources, for moving noise sources such as traffic, an attenuation rate of 4.5 dB per doubling of distance is used (Caltrans FHWA-RD-77-108). The resulting level is within the normally acceptable range for public buildings shown in

Table 4.9-7. As a result, no noise impacts are identified for users of the training center from existing or future SR 128 traffic noise.

The nearest outdoor training area on the project site to I-505 is the proposed equipment (excavation) area. Ambient noise measurement Site 3, which was located within this area, reported existing noise levels ranging from 58 to 60 dB L_{dn}. Future traffic noise levels would be approximately 3 dB higher than existing I-505 traffic noise levels assuming a doubling of traffic in the future. This is because a doubling of the sound energy resulting from a doubling of traffic volume equates to a 3 dB increase (Noise Increase = 10*Logarithm [N_f/N_e], where N_f is future traffic and N_e is existing traffic). The resulting ambient noise environment within the proposed equipment area would be approximately 63 dB L_{dn}. Because this aspect of the onsite training is noise-generating rather than noise-sensitive, the 70 dB L_{dn} industrial noise standard shown in Table 4.9-7 would logically apply. The predicted noise environment within this training area would be below the 70 dB L_{dn} threshold. As a result, noise impacts identified for users of the equipment excavation area from existing or future I-505 traffic noise are predicted to be less than significant.

Table 4.9-13
Predicted SR-128 Traffic Noise Levels with and without the Proposed Project

Segment	Segment Description	Predicted Traffic Noise Level, Ldn, @ 100 feet from Roadway Centerline					
		Baseline No-Project[1]	Baseline + Project[2]	Increase	Cumulative No-Project[3]	Cumulative + Project[4]	Increase
1	West of E Main St.	64.9	64.9	0.0	68.0	68.1	0.1
2	E Main St. - Timber Crest Rd.	65.2	65.3	0.1	69.7	69.7	0.0
3	Timber Crest Rd. - Co. Rd. 90	65.2	66.1	0.9	69.7	69.8	0.1
4	Co. Rd. 90 - I-505 SB Ramps	65.2	66.2	1.0	69.7	69.9	0.2
5	I-505 SB Ramps - I-505 NB Ramps	64.2	65.0	0.8	68.3	68.4	0.1
6	East of I-505 NB Ramps	63.1	63.3	0.2	66.5	66.8	0.3

Source: FHWA-RD-77-108 with inputs shown in Appendix D.

Notes:

1. Baseline No-Project conditions represent noise levels resulting from the existing traffic on the area roadways with the project site undeveloped.
2. Baseline + Project conditions represent traffic noise levels along the area roadways resulting from existing traffic plus additional traffic which would be generated by the proposed project.
3. Cumulative No-Project conditions represent noise levels resulting from the future traffic on the area roadways with the project site remaining in agricultural use.
4. Cumulative +Project conditions represent traffic noise levels along the area roadways resulting from future traffic plus additional traffic which would be generated by the proposed project.

Table 4.9-13 indicates that the project-related increase in traffic noise levels is predicted to range from 0.0 to 1.0 dB L_{dn} relative to existing conditions, and from 0.0 to 0.3 dB L_{dn} relative to future conditions without the project. Because the predicted, project-related, noise level increase is below the City of Winters 3 dB threshold, noise impacts for this aspect of the project are identified as being Less than Significant.

Impact 4.9-3

Project Construction and Equipment used at the project site would generate vibration. This is considered to be a less than significant impact (LTS).

The proposed project will introduce new vibration sources which could affect the local ambient noise environment. Most of the activities proposed at the site generate very little vibration. The equipment that will generate the highest vibration levels at the project site is to be jack hammers. The Federal Transit Administration noise and vibration impact assessment manual (FTA-VA-90-1003-06), reports vibration levels for a variety of construction-related equipment (Table 12-2 of FTA Manual). The portions of that table which are applicable to this project are reproduced in Table 4.9-14.

Table 4.9-14
Vibration Source Levels from Construction Equipment

Equipment Type	PPV at 25 ft. (In/Sec)
Vibratory Roller	0.210
Loaded Trucks	0.076
Jack Hammer	0.035
Bulldozer	0.089
Source: FTA-VA-90-1003-06	

With the exception of the vibratory roller, vibration generated by each of the equipment types in Table 4.9-14 are below 0.1 inches/second peak particle velocity (PPV) at the reference distance of 25 feet. The nearest proximity of any of the vibration-generating equipment to be used at the project site to the adjacent sensitive areas during project construction and ongoing training operations is in excess of 150 and 300 feet, respectively.

Given the substantial setback between vibration-generating activities proposed at the project site and the nearest sensitive receptor areas, including temporary project construction activities, project-generated vibration levels are predicted to be well below the 0.1 inches per second peak particle velocity threshold established by the City of Winters at those sensitive locations. As a result, construction and project-generated operational vibration levels are predicted to be imperceptible at off-site locations and vibration impacts identified for the project are identified as less than significant.

Impact 4.9-4

> **Equipment used at the project site will cause an increase in ambient noise levels at the nearest sensitive receptors to the project site in excess of standards established in the general plan or noise ordinance. This is considered to be a significant impact (S).**

The proposed project will introduce new noise sources which will affect the local ambient noise environment. For example, noise-generating equipment associated with training activities to be conducted at the project site would include such sources as back hoes, compactors, concrete mixers, cranes, generators, grinders, impact wrenches, jack hammers, service trucks, and asphalt/concrete saws.

To predict the noise generation of the on-site noise sources at the nearest sensitive receptor locations (residences, park users within the Putah Creek open space area to the south, commercial uses to the north, and the existing industrial use to the east – See Figure 4.9-2), reference noise level data collected by The Acoustics and Vibration Group (TAVG) and Bollard Acoustical Consultants, Inc. at the existing PG&E training facility in Livermore California were used. The measured noise level data were adjusted to account for the duration of time each source would typically be used at the Winters training facility during a typical hour in order to predict hourly average noise levels (L_{eq}) at the nearby sensitive areas. The reference sound levels at a standardized distance of 100 feet from the source are provided in Appendix E.

While it is recognized that training activities conducted at the project site will occur throughout the course of the day, a 1-hour period is used to assess project noise impacts because the City of Winters average (L_{eq}) noise standards are interpreted as being applicable to a 1-hour period, as described previously in this report.

The reference data were also corrected for distance to the nearest sensitive receptors based on the locations on the project site where the noise-generating equipment would be used. Figure 4.9-2 shows the project site plan. The distances used to predict maximum noise levels (L_{max}) were the closest points where the various on-site activities would occur to the nearest sensitive areas. For the prediction of average noise levels (L_{eq}), the distances from the approximate noise center of the locations where the various on-site activities will occur to the nearest sensitive receptors were used. The distances from each project-related noise source to each receptor analyzed in this study are provided in Appendix E.

Sound levels decay at a rate of 6 dB per each doubling of distance from a point source of noise based on spherical spreading of sound waves alone (Handbook of Acoustical Measurements and Noise Control, Harris, Chapter 3). In addition, sound is absorbed in the atmosphere and by the ground as it travels over distance. Although the rates of atmospheric absorption and ground absorption vary depending on weather conditions and ground cover, these effects can be generally estimated for standard atmospheric conditions by applying an additional decay rate of 1.5 dB per thousand feet from the noise source. These sound propagation characteristics (6 dB per doubling of distance and 1.5 dB per thousand feet), were utilized in this analysis to project the reference sound pressure level data collected elsewhere to the locations of the nearest sensitive receptors to the Winters project site.

In addition to decreases with sound which occur with increasing distance from the noise source, sound propagation is also affected by the presence of noise barriers such as structures or topography. For this project, the Learning Center, M&C Tech Center, and T&D Tech Center will provide shielding of certain on-site noise sources in the direction of sensitive residential receptors R1, R2 & R3 shown on Figure 4.9-2. These buildings represent tall solid noise barriers and the noise reduction resulting from this shielding is predicted to be 15 dB at shielded locations.

The project also proposes the construction of a solid 7-foot tall masonry wall the locations shown on Figure 4.9-2. Once a noise barrier intercepts line-of-sight between a noise source and receptor, a sound pressure level decrease of 5 dB is obtained. As a rule of thumb, each additional foot of wall height above that necessary to intercept line of sight typically provides one (1) additional dB decrease in noise levels. The noise reduction of the proposed solid noise barrier was included in the computations of project noise exposure at the receivers analyzed in this study.

Although Putah Creek is approximately 20 feet below the elevation of the project site, a future trail along the creek is envisioned near the top of the creek embankment. So while trail users would be shielded from project noise by the proposed 8-foot tall masonry sound barrier proposed at the locations shown on Figure 4.9-2, they would not be shielded by intervening topography unless the trail is constructed at least 5 feet below the top of the embankment. For this assessment, only shielding provided by the proposed 7-foot barrier was considered along the future Putah Creek trail area since it was assumed the future trail would be constructed near, or at, the top of the embankment.

Average (L_{eq}) noise levels for users of the future Putah Creek Trail would depend on the duration of time a trail user would be exposed to project noise levels. Based on a typical walking speed of 3 mph and 600 feet of project frontage along the future trail, the typical trail walker would be adjacent to the project site for less than 3 minutes, with the duration for runners and cyclists considerably lower. Predicted hourly average noise levels for future trail users were conservatively adjusted downward by 10 dB to account for this limited duration of exposure to project noise generation. Because maximum noise levels occur instantaneously and are not a function of the duration of exposure of the trail users to project-generated noise levels, no adjustments to predicted project-generated maximum noise levels along the future Putah Creek trail were applied.

Table 4.9-15 shows the predicted average (L_{eq}) and maximum (L_{max}) on-site noise source noise levels at the nearest sensitive receptors to the project site as well as the Putah Creek open space to the south.

Table 4.9-15
Predicted On-Site Source Noise Levels at Nearest Sensitive Receptors

Noise Source	Source Location[1]	Leq Standard[2]	Predicted Leq, dBA[3]					Lmax Standard	Predicted Lmax, dBA[3]				
			R1	R2	R3	R4	Creek		R1	R2	R3	R4	Creek
Back Hoe (beeper)	Equipment Training	45	26	31	32	28	26	60	42	46	48	44	58
Back Hoe (beeper)	T&D	45	19	16	16	22	16	60	33	30	30	36	40
Back Hoe (digging)	Equipment Training	50	33	33	39	35	33	65	42	41	48	44	58
Back Hoe (digging)	T&D	50	26	23	23	29	23	65	33	30	30	36	40
Blow Downs	Cold Pits	50	23	36	31	25	20	65	32	45	40	34	39
Blow Downs	Hydrotest Platform	50	22	31	31	25	21	65	41	50	50	44	50
Blow Downs	Indoor Flow Lab	50	**59**	**54**	**53**	46	39	65	61	56	55	48	51
Blow Downs	Mock Well Head	50	22	30	31	24	19	65	41	49	50	43	48
Blow Downs	Pipe Inspection	50	22	31	31	26	22	65	41	50	50	45	51
Blow Downs	Trans M&C	50	22	31	31	25	21	65	41	50	50	44	50
Blowing Air	Indoor Flow Lab	50	**59**	**54**	**53**	46	39	65	**66**	61	60	53	56
Blowing Air	Utility Village	50	24	25	26	17	4	65	57	58	59	50	47
Compactor, Large	Equipment Training	50	36	36	43	39	36	65	44	43	50	46	60
Compactor, Large	T&D	50	30	27	27	32	27	65	35	32	32	37	42
Compactor, Small	Equipment Training	50	34	34	41	37	34	65	43	42	49	45	59
Compactor, Small	T&D	50	34	31	31	36	31	65	37	34	34	39	44
Conc Mixer HT	Equipment Training	50	40	38	39	36	32	65	50	48	49	46	52
Conc Mixer HT	T&D	50	32	30	30	35	30	65	42	40	40	45	50
Cranes, Hydraulics	Crane	50	28	36	36	32	27	65	38	46	46	41	46
Cranes, Setup/Beeping	Crane	50	25	33	33	29	24	65	38	46	46	41	46
Field Generator	Cold Pits	50	16	29	24	18	13	65	26	39	34	28	33
Field Generator	Equipment Training	50	21	26	28	24	22	65	34	38	40	36	50
Field Generator	Hydrotest Platform	50	15	29	24	18	14	65	25	39	34	28	34
Field Generator	T&D	50	15	12	12	17	12	65	25	22	22	27	32
Field Generator	Utility Village	50	31	32	28	19	6	65	41	42	38	29	26
Grinder	Crane	50	14	27	22	18	13	65	25	38	33	28	33
Grinder	T&D	50	15	12	12	17	12	65	25	22	22	27	32
Hoe Ram - Breaker	Equipment Training	45	36	34	35	32	29	60	47	45	46	43	50
Hoe Ram - Idle	Equipment Training	45	22	25	21	18	14	60	27	30	26	23	29
Impact Wrench	Cold Pits	50	21	34	29	23	18	65	34	47	42	36	41
Impact Wrench	Pipe Inspection	50	20	34	29	24	20	65	33	47	42	37	43
Impact Wrench	T&D	50	20	17	17	22	17	65	33	30	30	35	40

Table 4.9-15
Predicted On-Site Source Noise Levels at Nearest Sensitive Receptors

Noise Source	Source Location[1]	Leq Standard[2]	Predicted Leq, dBA[3]					Lmax Standard	Predicted Lmax, dBA[3]				
			R1	R2	R3	R4	Creek		R1	R2	R3	R4	Creek
Impact Wrench	Trans M&C	50	20	34	29	24	19	65	33	47	42	37	42
Jack Hammer - Concrete	T&D	45	41	38	38	43	38	60	47	44	44	49	54
Md & Hvy Trucks - Loaded	Commercial Driving	50	37	33	35	29	26	65	48	44	48	40	48
Md & Hvy Trucks - Loaded	Hydrotest Platform	50	24	33	33	27	23	65	33	42	42	36	42
Md & Hvy Trucks - Loaded	Parking	50	26	32	30	28	19	65	35	41	39	37	38
Md & Hvy Trucks - Loaded	T&D	50	29	26	26	31	26	65	33	30	30	35	40
Md & Hvy Trucks - Loaded	Trans M&C	50	29	38	38	32	28	65	33	42	42	36	42
Md & Hvy Trucks - Loaded	Utility Village	50	40	36	37	28	15	65	49	45	46	37	34
Md & Hvy Trucks - Slow	Commercial Driving	50	36	32	34	28	25	65	44	41	45	37	45
Md & Hvy Trucks - Slow	Parking	50	20	31	24	22	12	65	32	43	36	34	34
Md & Hvy Trucks - Slow	T&D	50	22	20	20	25	20	65	29	27	27	32	37
Md & Hvy Trucks - Slow	Trans M&C	50	22	32	32	26	22	65	29	39	39	33	39
Truck Backup Beeper	Commercial Driving	45	27	23	25	19	16	60	48	44	48	40	48
Truck Backup Beeper	Equipment Training	45	20	25	27	23	21	60	42	46	48	44	58
Truck Backup Beeper	T&D	45	14	11	11	16	11	60	33	30	30	35	40
Vehicle Horn	Commercial Driving	45	27	23	25	19	16	60	49	45	49	41	49
Vehicle Horn	Equipment Training	45	20	25	27	23	21	60	43	47	49	45	59
Vehicle Horn	T&D	45	14	11	11	16	11	60	41	38	38	43	48
Vehicle Horn	Utility Village	45	30	31	27	18	5	60	57	58	54	45	42
All Sources Concurrently	All Source Locations	50	**62**	**57**	**57**	**51**	46	N/A					

1. The locations on the project site where the various noise sources would operate are shown on Figure 4.9-2.
2. Pursuant to the City of Winters noise criteria, the daytime average (Leq) and maximum (Lmax) standards at the nearby sensitive receptors (residences and Putah Creek) are 50 dB and 65 dB, respectively, for all on-site noise sources which are not tonal or impulsive in nature. The daytime standards applicable to tonal or impulsive noise sources are 45 dB Leq and 60 dB Lmax.
3. Predicted average and maximum noise levels at the four nearest residences and Putah Creek area were predicted based on reference noise level data collected at the PG&E training center in Livermore California using a sound level decay rate of 6 dB per doubling of distance from the source and an atmospheric absorption rate of 1.5 dB per thousand feet. The distances to the residences was assumed to be the property line for the residences to the west, and to the residential structures for the residences constructed on agriculturally-zoned lands. This is because there is no sensitivity associated with the agricultural property itself, but there is sensitivity at the residence constructed on the agricultural property. In addition, a -5 dB offset was applied for locations screened by the proposed masonry noise barrier and a -15 dB offset was applied to areas shielded by structures.
4. **Noise levels shown in Bold Red exceed the applicable noise standard and would require additional mitigation.**

Source: Bollard Acoustical Consultants with reference data provided by TAVG and BAC noise measurement data.

Table 4.9-15 indicates that project-generated noise levels resulting from some on-site activities would exceed the project standards of significance at the nearest existing residences to the west.[1] Specifically, noise levels generated by the venting of air blow-downs and blowing air (separate activities generating differing sound levels), occurring at the indoor flow lab are predicted to exceed their respective significance thresholds at one or more of the nearest noise-sensitive receptors to the project site. In addition, the combined noise generation of all sources, in the unlikely event that all sources would occur concurrently during the same hour, would also exceed the project standards of significance. As a result, this impact is identified as being potentially significant and noise mitigation measures would be required for this aspect of the project, as follows:

Hours of Operation Noise Mitigation

Mitigation Measure 4.9-1a

All exterior training activities occurring on the project site shall adhere to the hours of hours of 7 am to 7pm consistent with City of Winters Municipal Code requirements. Weekend operations at the facility can occur provided they are limited to these hours and noise levels satisfy the project standards of significance with respect to noise.

Blow Down and Blowing Air Noise Mitigation Measure

Mitigation Measure 4.9-1b

High-pressure air releases through the roof of the indoor flow lab shall be fitted with silencers capable of providing 20 dB of noise reduction.

Jack Hammer Noise Mitigation

Mitigation Measure 4.9-1c

Jack hammer training activities shall be conducted only within the T&D area as proposed.

Mitigation Measure 4.9-1d

Solid noise barriers 6-feet in height shall be constructed adjacent to the north side of the northern T&D training pad and along the south side of the southern T&D training pad at the locations shown on Figure 4.9-2. Due to the proximity of these barriers to the noise source, and the low height of the jackhammer noise source, the noise reduction of this measure is estimated to be 8 dB.

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[1] No noise standards would be exceeded for the agricultural, industrial and commercial uses located to the north and east of the project site as these receptors have lower sensitivity to noise than residential and open space uses, have higher noise standards (See Tables 4.9-8 and 4.9-11), and generally comparable setbacks as the nearest existing residences to the project site.

Implementation of these mitigation measures would mitigate noise impacts from both individual noise sources as well as combined noise generation of multiple noise sources occurring concurrently to a less-than-significant (LTS) level.

Impact 4.9-5

The project site is not located within the vicinity of nearby airfields or airports. This is considered to be a less than significant impact (LTS).

There are no nearby airports in the project vicinity. As a result, the project site is not adversely affected by aircraft noise and no further evaluation of aircraft noise impacts associated with public airports is warranted for this project. In addition, no private airstrips were identified in the project vicinity so an evaluation of aircraft noise impacts associated with such facilities is not warranted for this project. Therefore, this impact is considered less than significant (LTS).

Impact 4.9-6

Equipment used at the project site during site grading and project construction will cause an increase in ambient noise levels at the nearest existing sensitive receptors to the project site. This is considered to be a significant impact (S).

During the construction phases of the project, noise from construction activities would add to the noise environment in the immediate project vicinity. Activities involved in construction would generate maximum noise levels, as indicated in Table 4.9-16, ranging from 70 to 90 dB at a distance of 50 feet.

As noted in the Regulatory Setting Section of this report, Section 8.20.100 of the City's Noise Ordinance (Prohibited Acts) specifies that the following acts are prohibited:

a. Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration, or demolition work between weekday hours of seven p.m. and seven a.m. or at any time on Sundays, weekends, or holidays, such that the sound therefrom creates a noise disturbance across a residential or commercial real property line, except for emergency work of public service utilities or by variance granted by the planning commission.

b. Noise Restrictions at Affected Properties. Where technologically and economically feasible, construction and demolition activities shall be conducted in such a manner that the maximum noise levels at affected properties shall not exceed ninety (90) dB measured at a distance of a least fifty (50) feet (fifteen (15) meters) from any single machine or vehicle between the hours of seven a.m. and seven p.m. weekdays. Sundays and holidays shall be subject to the exterior noise level standards as set forth in Table 4.9-11 (Section 8.20.080);

To summarize the Noise Ordinance provisions cited above, construction activities occurring during weekday periods between 7 am and 7 pm shall not exceed 90 dB at a distance of 50 feet from any single machine or vehicle. Because project construction activities would not occur within 50 feet of an existing noise sensitive receptor, provided construction activities are

limited to the hours shown above, the Table 4.9-16 data indicate that provisions of the Noise Ordinance would be satisfied and this impact would be considered less than significant (LTS). If, however, weekend, holiday or evening/nighttime (7 pm – 7 am) construction activities are to occur that the project site, such activities would exceed the Noise Ordinance criteria cited above at the nearest noise sensitive receptors or result in a noise disturbance. As a result, this impact is considered significant (S).

Table 4.9-16
Typical Construction Equipment Noise

Equipment Description	Maximum Noise Level at 50 feet, dBA
Auger drill rig	85
Backhoe	80
Bar bender	80
Boring jack power unit	80
Chain saw	85
Compactor (ground)	80
Compressor (air)	80
Concrete batch plant	83
Concrete mixer truck	85
Concrete pump truck	82
Concrete saw	90
Crane (mobile or stationary)	85
Dozer	85
Dump truck	84
Excavator	85
Flat bed truck	84
Front end loader	80
Generator (25 kilovoltamperes [kVA] or less)	70
Generator (more than 25 kVA)	82
Grader	85
Hydra break ram	90
Jackhammer	85
Mounted impact hammer (hoe ram)	90
Paver	85
Pickup truck	55
Pneumatic tools	85
Pumps	77
Rock drill	85
Scraper	85
Soil mix drill rig	80
Tractor	84
Vacuum street sweeper	80
Vibratory concrete mixer	80
Welder/Torch	73

Source: Federal Highway Administration 2006.

Because construction activities occurring during weekend, holiday, or evening/nighttime hours (7 pm – 7 am) could result in a significant noise impact, noise mitigation measures would be required for this aspect of the project, as follows:

Mitigation Measure 4.9-2

All project construction activities shall be limited to the hours of 7 am to 7 pm, Monday through Friday, excluding holidays, unless a variance is obtained from the Town of Winters allowing construction outside of those hours.

Implementation of this mitigation measure would mitigate this impact to a less-than-significant (LTS) level.

CUMULATIVE NOISE & VIBRATION IMPACTS

Impact 4.9-7

Project-generated traffic could result in permanent increases in cumulative traffic noise levels in the project vicinity. This is considered to be a less than significant impact (LTS).

The modeled future (cumulative), project and no-project, traffic noise levels along SR 128 are provided in Table 4.9-13. That table indicates that the project-related increase in cumulative traffic noise levels is predicted to range from 0.0 to 0.3 dB L_{dn}. Because this range of cumulative traffic noise level increases is well below the City of Winters 3 dB threshold for a finding of significant noise impact, this impact is considered less than significant.

Impact 4.9-8

Users of the facility could be exposed to future (cumulative) traffic noise levels from State Route 128 and Interstate 505 in excess of standards established in the general plan or noise ordinance. This is considered to be a less than significant impact (LTS).

The nearest noise-sensitive area on the project site to SR 128 is the proposed learning center building. This building is proposed to be located approximately 400 feet from the SR 128 centerline. Extrapolation of the Table 4.9-13 traffic noise levels to that 400-foot distance using an attenuation rate of 4.5 dB per doubling of distance from the roadway results in a future exterior noise level of 61 dB L_{dn}. Although an attenuation rate of 6 dB per doubling of distance is used to predict propagation of stationary noise sources, for moving noise sources such as traffic, an attenuation rate of 4.5 dB per doubling of distance is used (Caltrans FHWA-RD-77-108). The resulting level is within the normally acceptable range for public buildings shown in Table 4.9-7. As a result, no noise impacts are identified for users of the training center from existing or future SR 128 traffic noise.

The nearest outdoor training area on the project site to I-505 is the proposed equipment (excavation) area. Ambient noise measurement Site 3, which was located within this area, reported existing noise levels ranging from 58 to 60 dB L_{dn}. Future traffic noise levels would be approximately 3 dB higher than existing I-505 traffic noise levels assuming a doubling of traffic in the future. This is because a doubling of the sound energy resulting from a doubling of traffic volume equates to a 3 dB increase (Noise Increase = 10*Logarithm [N_f/N_e], where N_f is future traffic and N_e is existing traffic). The resulting ambient noise environment within the proposed equipment area would be approximately 63 dB L_{dn}. Because this aspect of the onsite training is

noise-generating rather than noise-sensitive, the 70 dB L_{dn} industrial noise standard shown in Table 4.9-7 would logically apply. The predicted noise environment within this training area would be below the 70 dB L_{dn} threshold. As a result, noise impacts identified for users of the equipment excavation area from existing or future I-505 traffic noise are predicted to be less than significant.

Impact 4.9-9

Equipment used at the project site would generate vibration when considered cumulatively with other sources of vibration is predicted to be below the threshold of perception at nearby sensitive receptors. This is considered to be a less than significant impact (LTS).

Impact 4.9-3 concluded that vibration impacts from the project alone would be less than significant. Because monitoring of baseline vibration levels and field surveys revealed there were no existing perceptible sources of vibration in the project vicinity, the cumulative impact of negligible project vibration added to negligible baseline vibration would remain negligible. As a result, this impact is considered less than significant.

Impact 4.9-10

Following implementation of Mitigation measure 4.9-1, project-related non-transportation noise sources associated with training activities will not cause a cumulative increase in ambient noise levels at the nearest sensitive receptors to the project site. This is considered to be a less than significant impact (LTS).

Impact 4.9-4 concluded that noise impacts associated with ongoing training activities at the project site would be significant and recommended noise mitigation measures. Implementation of Mitigation Measure 4.9-1 would mitigate that impact to a less than significant level. With the exception of off-site traffic, for which the cumulative effects are evaluated separately in Impacts 4.9-7 and 4.9-8, there are no other substantial sources of noise in the immediate project vicinity. Because it is infeasible to predict the noise generation of future uses constructed between the project site and the existing residences to the west, an evaluation of cumulative noise impacts associated with that future development cannot be provided. However, at such time as that property is developed, any noise impacts of that development, including cumulative impacts of that development in conjunction with this project, would be required to be mitigated by the developer of that neighboring project. As a result, this impact is considered less than significant.

Figure 4.9 - 1

PG&E Training Facility - Winters, California

Project Area and Measurement Locations

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Scale (feet)
0 250 500

Figure 4.9 - 2

PG&E Training Facility - Winters, California

Project Site Plan and Nearest Noise-Sensitive Receivers

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Scale (feet)

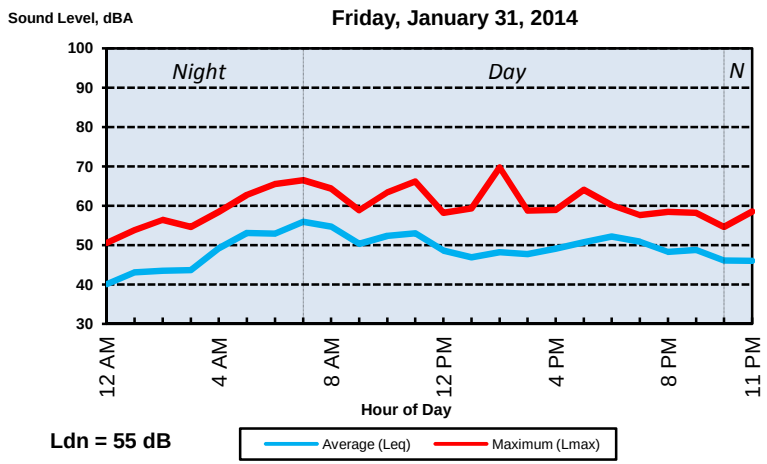
0 250 500

Appendix A

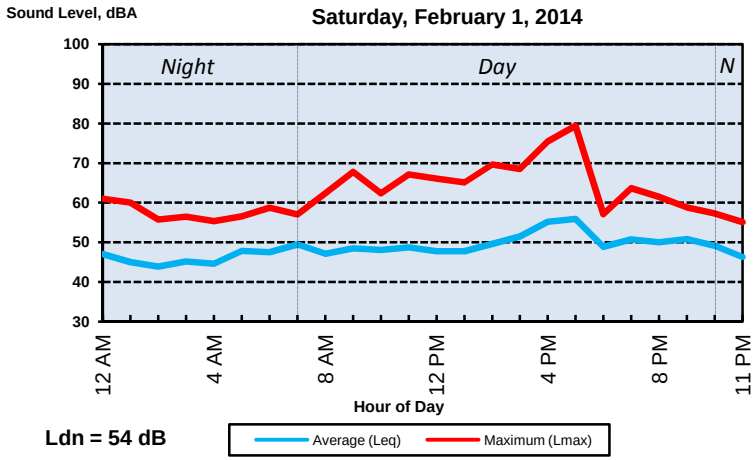
Acoustical Terminology

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.
Loudness	A subjective term for the sensation of the magnitude of sound.
Masking	The amount (or the process) by which the threshold of audibility is for one sound is raised by the presence of another (masking) 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.
SEL	A rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy of the event into a 1-s time period.
Threshold of Hearing	The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.
Threshold of Pain	Approximately 120 dB above the threshold of hearing.

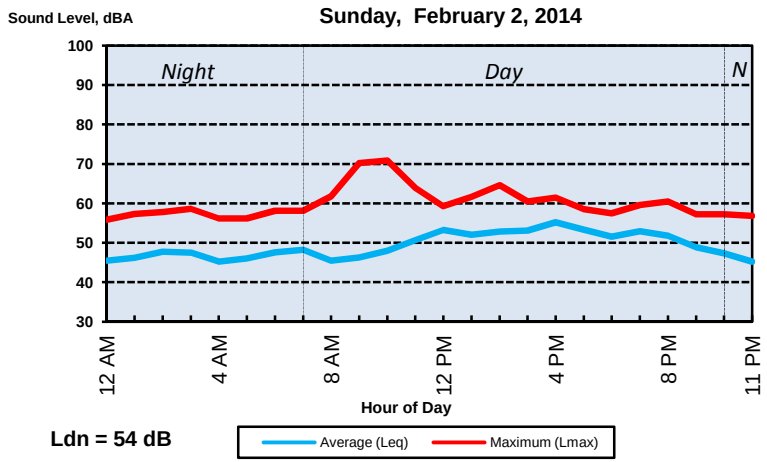
Appendix B-1
Continuous Ambient Noise Monitoring Results
PG&E Training Facility - Site #1 - Western Property Boundary



Ldn = 55 dB



Ldn = 54 dB



Ldn = 54 dB

	Daytime	Nighttime
Mean Maximum (Lmax):	63	57
Mean Average (Leq):	50	46

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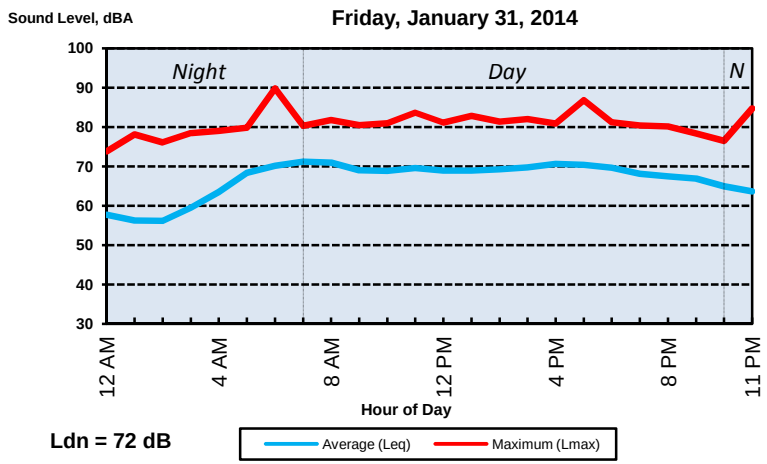
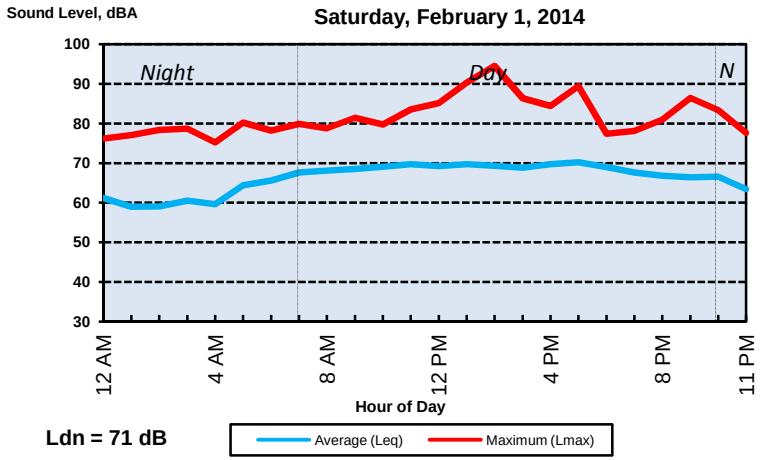
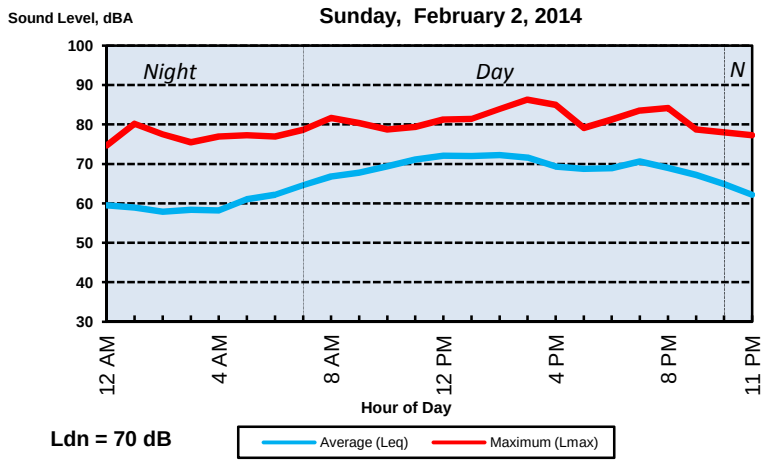
Appendix B-2
Continuous Ambient Noise Monitoring Results
PG&E Training Facility - Site #2 - Northern Property Boundary



Ldn = 72 dB



Ldn = 71 dB



Ldn = 70 dB

	Daytime	Nighttime
Mean Maximum (Lmax):	82	78
Mean Average (Leq):	69	62

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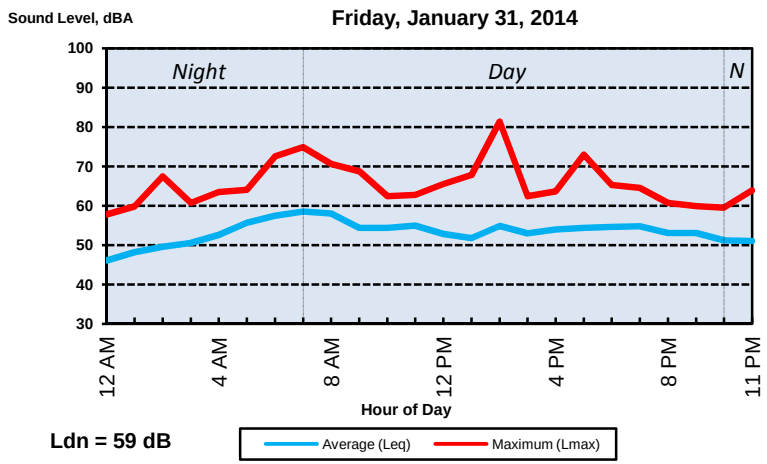
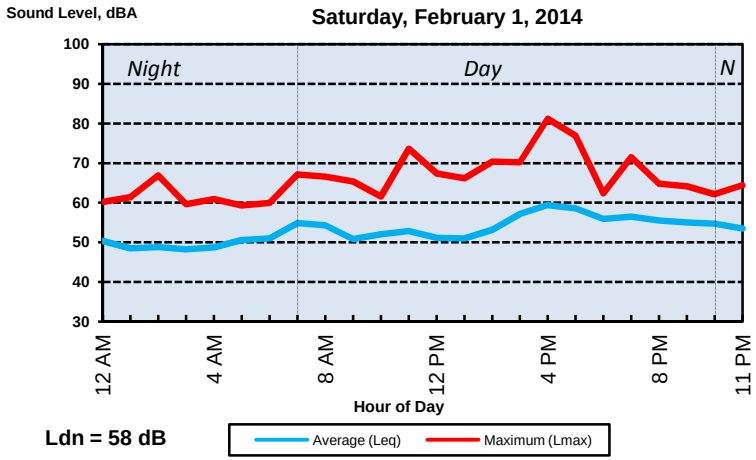
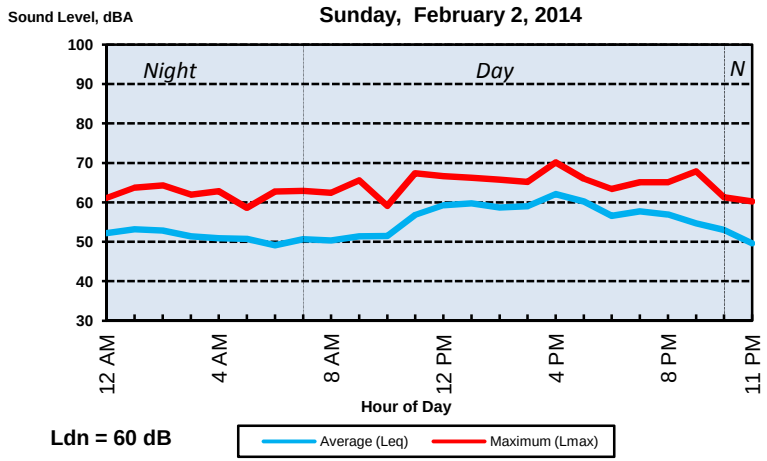
Appendix B-3
Continuous Ambient Noise Monitoring Results
PG&E Training Facility - Site #3 - Eastern Property Boundary



Ldn = 59 dB



Ldn = 58 dB



Ldn = 60 dB

	Daytime	Nighttime
Mean Maximum (Lmax):	67	62
Mean Average (Leq):	55	51

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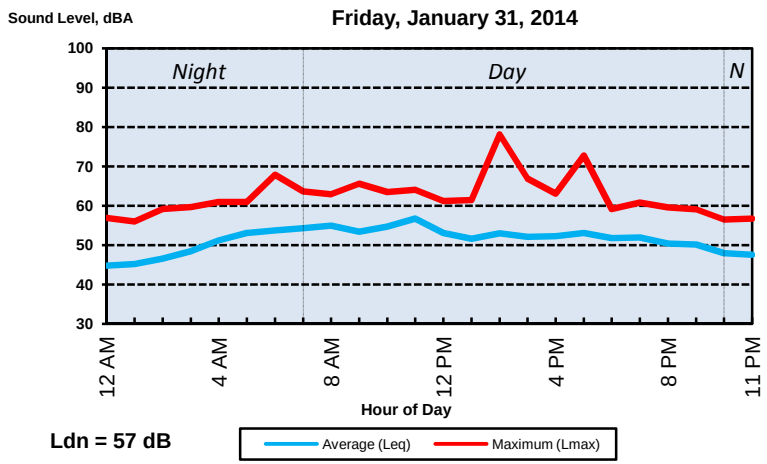
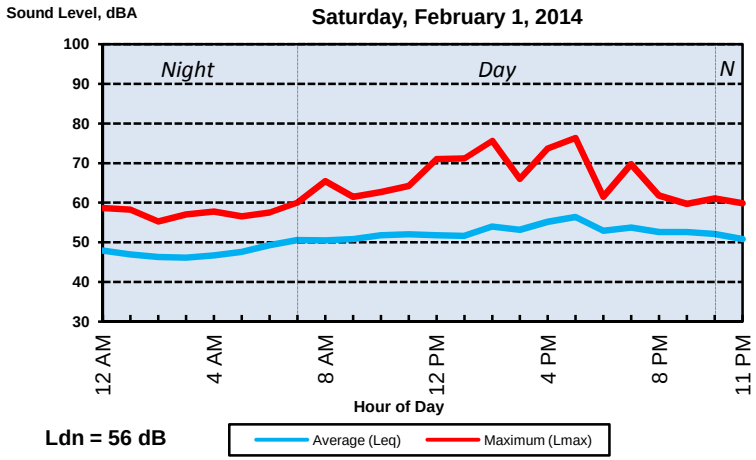
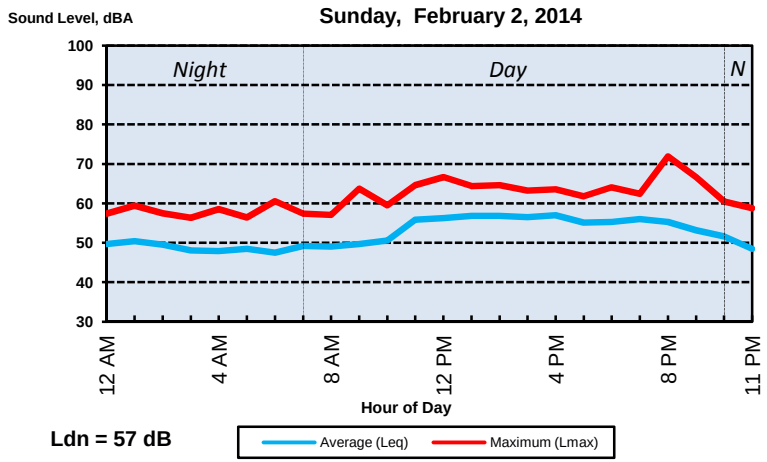
Appendix B-4
Continuous Ambient Noise Monitoring Results
PG&E Training Facility - Site #4 - Southern Property Boundary



Ldn = 57 dB



Ldn = 56 dB



Ldn = 57 dB

	Daytime	Nighttime
Mean Maximum (Lmax):	65	59
Mean Average (Leq):	53	49

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Appendix C
Winters PG&E Training Facility Noise and Vibration Monitoring Photos

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Appendix D-1

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

Project #: 2014-022 PG&E Training Facility in Winters
Description: Existing Conditions
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Grant Ave.	West of E Main St.	8925	83		17	1	6.5	45	100	
2	Grant Ave.	E Main St. - Timber Crest Rd.	9,480	83		17	1	6.5	45	100	
3	Grant Ave.	Timber Crest Rd. - Co. Rd. 90	9,480	83		17	1	6.5	45	100	
4	Grant Ave.	Co. Rd. 90 - I-505 SB Ramps	9600	83		17	1	6.5	45	100	
5	Grant Ave.	I-505 SB Ramps - I-505 NB Ramps	7675	83		17	1	6.5	45	100	
6	Russell Blvd.	East of I-505 NB Ramps	5850	83		17	1	6.5	45	100	

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Appendix D-2

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

Project #: 2014-022 PG&E Training Facility in Winters
Description: Existing + Project Conditions
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Grant Ave.	West of E Main St.	9020	83		17	1	6.5	45	100	
2	Grant Ave.	E Main St. - Timber Crest Rd.	9780	83		17	1	6.5	45	100	
3	Grant Ave.	Timber Crest Rd. - Co. Rd. 90	11855	83		17	1	6.5	45	100	
4	Grant Ave.	Co. Rd. 90 - I-505 SB Ramps	11965	83		17	1	6.5	45	100	
5	Grant Ave.	I-505 SB Ramps - I-505 NB Ramps	9230	83		17	1	6.5	45	100	
6	Russell Blvd.	East of I-505 NB Ramps	6160	83		17	1	6.5	45	100	

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Appendix D-3

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

Project #: 2014-022 PG&E Training Facility in Winters
Description: Existing + Approved Conditions
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Grant Ave.	West of E Main St.	15550	83		17	1	6.5	45	100	
2	Grant Ave.	E Main St. - Timber Crest Rd.	16225	83		17	1	6.5	45	100	
3	Grant Ave.	Timber Crest Rd. - Co. Rd. 90	17520	83		17	1	6.5	45	100	
4	Grant Ave.	Co. Rd. 90 - I-505 SB Ramps	16975	83		17	1	6.5	45	100	
5	Grant Ave.	I-505 SB Ramps - I-505 NB Ramps	13225	83		17	1	6.5	45	100	
6	Russell Blvd.	East of I-505 NB Ramps	9325	83		17	1	6.5	45	100	

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Appendix D-4

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

Project #: 2014-022 PG&E Training Facility in Winters
Description: Existing + Approved Conditions + Project Conditions
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Grant Ave.	West of E Main St.	15640	83		17	1	6.5	45	100	
2	Grant Ave.	E Main St. - Timber Crest Rd.	16275	83		17	1	6.5	45	100	
3	Grant Ave.	Timber Crest Rd. - Co. Rd. 90	18855	83		17	1	6.5	45	100	
4	Grant Ave.	Co. Rd. 90 - I-505 SB Ramps	19350	83		17	1	6.5	45	100	
5	Grant Ave.	I-505 SB Ramps - I-505 NB Ramps	14780	83		17	1	6.5	45	100	
6	Russell Blvd.	East of I-505 NB Ramps	9870	83		17	1	6.5	45	100	

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Appendix D-5

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

Project #: 2014-022 PG&E Training Facility in Winters
Description: Cumulative No Project Conditions
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Grant Ave.	West of E Main St.	18320	83		17	1	6.5	45	100	
2	Grant Ave.	E Main St. - Timber Crest Rd.	26720	83		17	1	6.5	45	100	
3	Grant Ave.	Timber Crest Rd. - Co. Rd. 90	26720	83		17	1	6.5	45	100	
4	Grant Ave.	Co. Rd. 90 - I-505 SB Ramps	27040	83		17	1	6.5	45	100	
5	Grant Ave.	I-505 SB Ramps - I-505 NB Ramps	19565	83		17	1	6.5	45	100	
6	Russell Blvd.	East of I-505 NB Ramps	12860	83		17	1	6.5	45	100	

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Appendix D-6

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

Project #: 2014-022 PG&E Training Facility in Winters
Description: Cumulative + Project Conditions
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Grant Ave.	West of E Main St.	18675	83		17	1	6.5	45	100	
2	Grant Ave.	E Main St. - Timber Crest Rd.	26975	83		17	1	6.5	45	100	
3	Grant Ave.	Timber Crest Rd. - Co. Rd. 90	27865	83		17	1	6.5	45	100	
4	Grant Ave.	Co. Rd. 90 - I-505 SB Ramps	27985	83		17	1	6.5	45	100	
5	Grant Ave.	I-505 SB Ramps - I-505 NB Ramps	19965	83		17	1	6.5	45	100	
6	Russell Blvd.	East of I-505 NB Ramps	13810	83		17	1	6.5	45	100	

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Acoustical Consultants

Appendix E

Reference Noise Source Sound Levels, Locations, and Distances to Analyzed Receptors

PG&E Winters Training Facility

		SPL @ 100 ft.		Leq Distance								Lmax Distance							
Source	**Location**	**Leq**	**Lmax**	**R1**	**R2**	**R3**	**R4**	**OS1**	**C1**	**C2**	**I1**	**R1**	**R2**	**R3**	**R4**	**OS1**	**C1**	**C2**	**I1**
Back Hoe (beeper)	Equipment Training	66	70	1400	1400	750	1100	500	1200	1200	900	1100	1200	600	900	200	1000	1000	800
Back Hoe (beeper)	T&D	66	70	1000	1300	1300	2000	1300	800	800	1100	1000	1300	1300	2000	1300	800	800	1100
Back Hoe (digging)	Equipment Training	63	70	1400	1400	750	1100	500	1200	1200	900	1100	1200	600	900	200	1000	1000	800
Back Hoe (digging)	T&D	63	70	1000	1300	1300	2000	1300	800	800	1100	1000	1300	1300	2000	1300	800	800	1100
Blow Downs	Cold Pits	73	77	900	1100	1100	1900	1200	800	800	1300	900	1100	1100	1900	1200	800	800	1300
Blow Downs	Hydrotest Platform	73	77	1000	1100	1100	1800	1100	900	1000	1300	1000	1100	1100	1800	1100	900	1000	1300
Blow Downs	Indoor Flow Lab	73	77	600	1000	1100	2100	1500	500	600	1500	600	1000	1100	2100	1500	500	600	1500
Blow Downs	Mock Well Head	73	77	1000	1200	1100	2000	1300	700	800	1400	1000	1200	1100	2000	1300	700	800	1400
Blow Downs	Pipe Inspection	73	77	1000	1100	1100	1700	1000	1000	1000	1200	1000	1100	1100	1700	1000	1000	1000	1200
Blow Downs	Trans M&C	73	77	1000	1100	1100	1800	1100	1000	1000	1300	1000	1100	1100	1800	1100	1000	1000	1300
Blowing Air	Indoor Flow Lab	80	82	600	1000	1100	2100	1500	500	600	1500	600	1000	1100	2100	1500	500	600	1500
Blowing Air	Utility Village	80	82	900	800	700	1700	2200	900	1100	1600	900	800	700	1700	2200	900	1100	1600
Compactor, Large	Equipment Training	66	71	1400	1400	750	1100	500	1200	1200	900	1100	1200	600	900	200	1000	1000	800
Compactor, Large	T&D	66	71	1000	1300	1300	2000	1300	800	800	1100	1000	1300	1300	2000	1300	800	800	1100
Compactor, Small	Equipment Training	70	73	1400	1400	750	1100	500	1200	1200	900	1100	1200	600	900	200	1000	1000	800
Compactor, Small	T&D	70	73	1000	1300	1300	2000	1300	800	800	1100	1000	1300	1300	2000	1300	800	800	1100
Conc Mixer HT	Equipment Training	74	79	1300	1500	1400	1800	1000	1100	1100	900	1300	1500	1400	1800	1000	1100	1100	900
Conc Mixer HT	T&D	74	79	1000	1300	1300	2000	1300	800	800	1100	1000	1300	1300	2000	1300	800	800	1100
Cranes, Hydraulics	Crane	65	74	1100	1300	1300	1900	1200	900	900	1000	1000	1200	1200	1900	1200	900	900	900
Cranes, Setup/Beeping	Crane	67	74	1100	1300	1300	1900	1200	900	900	1000	1000	1200	1200	1900	1200	900	900	900
Field Generator	Cold Pits	51	61	900	1100	1100	1900	1200	800	800	1300	900	1100	1100	1900	1200	800	800	1300
Field Generator	Equipment Training	51	61	1400	1400	750	1100	500	1200	1200	900	1100	1200	600	900	200	1000	1000	800
Field Generator	Hydrotest Platform	51	61	1000	1100	1100	1800	1100	900	1000	1300	1000	1100	1100	1800	1100	900	1000	1300
Field Generator	T&D	51	61	1000	1300	1300	2000	1300	800	800	1100	1000	1300	1300	2000	1300	800	800	1100
Field Generator	Utility Village	51	61	900	800	700	1700	2200	900	1100	1600	900	800	700	1700	2200	900	1100	1600
Grinder	Crane	51	61	1100	1300	1300	1900	1200	900	900	1000	1000	1200	1200	1900	1200	900	900	900
Grinder	T&D	51	61	1000	1300	1300	2000	1300	800	800	1100	1000	1300	1300	2000	1300	800	800	1100
Hoe Ram - Breaker	Equipment Training	68	76	1300	1500	1400	1800	1000	1100	1100	900	1300	1500	1400	1800	1000	1100	1100	900
Hoe Ram - Idle	Equipment Training	56	56	1300	1500	1400	1800	1000	1100	1100	900	1300	1500	1400	1800	1000	1100	1100	900
Impact Wrench	Cold Pits	66	69	900	1100	1100	1900	1200	800	800	1300	900	1100	1100	1900	1200	800	800	1300
Impact Wrench	Pipe Inspection	66	69	1000	1100	1100	1700	1000	1000	1000	1200	1000	1100	1100	1700	1000	1000	1000	1200
Impact Wrench	T&D	66	69	1000	1300	1300	2000	1300	800	800	1100	1000	1300	1300	2000	1300	800	800	1100
Impact Wrench	Trans M&C	66	69	1000	1100	1100	1800	1100	1000	1000	1300	1000	1100	1100	1800	1100	1000	1000	1300
Jack Hammer - Concrete	T&D	80	83	1000	1300	1300	2000	1300	800	800	1100	1000	1300	1300	2000	1300	800	800	1100
Md & Hvy Trucks - Loaded	Commercial Driving	65	69	1200	1100	900	1500	800	1200	1300	1300	1000	900	600	1300	600	1000	1000	1000
Md & Hvy Trucks - Loaded	Hydrotest Platform	65	69	1000	1100	1100	1800	1100	900	1000	1300	1000	1100	1100	1800	1100	900	1000	1300
Md & Hvy Trucks - Loaded	Parking	65	69	800	1200	1400	1700	1600	1000	1000	1000	800	1200	1400	1700	1600	1000	1000	1000
Md & Hvy Trucks - Loaded	T&D	65	69	1000	1300	1300	2000	1300	800	800	1100	1000	1300	1300	2000	1300	800	800	1100
Md & Hvy Trucks - Loaded	Trans M&C	65	69	1000	1100	1100	1800	1100	1000	1000	1300	1000	1100	1100	1800	1100	1000	1000	1300
Md & Hvy Trucks - Loaded	Utility Village	65	69	900	800	700	1700	2200	900	1100	1600	900	800	700	1700	2200	900	1100	1600
Md & Hvy Trucks - Slow	Commercial Driving	59	66	1200	1100	900	1500	800	1200	1300	1300	1000	900	600	1300	600	1000	1000	1000
Md & Hvy Trucks - Slow	Parking	59	66	800	1200	1400	1700	1600	1000	1000	1000	800	1200	1400	1700	1600	1000	1000	1000
Md & Hvy Trucks - Slow	T&D	59	66	1000	1300	1300	2000	1300	800	800	1100	1000	1300	1300	2000	1300	800	800	1100
Md & Hvy Trucks - Slow	Trans M&C	59	66	1000	1100	1100	1800	1100	1000	1000	1300	1000	1100	1100	1800	1100	1000	1000	1300
Truck Backup Beeper	Commercial Driving	60	69	1200	1100	900	1500	800	1200	1300	1300	1000	900	600	1300	600	1000	1000	1000
Truck Backup Beeper	Equipment Training	60	69	1400	1400	750	1100	500	1200	1200	900	1100	1200	600	900	200	1000	1000	800
Truck Backup Beeper	T&D	60	69	1000	1300	1300	2000	1300	800	800	1100	1000	1300	1300	2000	1300	800	800	1100
Vehicle Horn	Commercial Driving	70	70	1200	1100	900	1500	800	1200	1300	1300	1000	900	600	1300	600	1000	1000	1000
Vehicle Horn	Equipment Training	70	70	1400	1400	750	1100	500	1200	1200	900	1100	1200	600	900	200	1000	1000	800
Vehicle Horn	T&D	70	77	1000	1300	1300	2000	1300	800	800	1100	1000	1300	1300	2000	1300	800	800	1100
Vehicle Horn	Utility Village	70	77	900	800	700	1700	2200	900	1100	1600	900	800	700	1700	2200	900	1100	1600