Environmental Noise Assessment Update

Kidder Creek Orchard Camp Use Permit Application – UP 11-15

Etna (Siskiyou County), California

BAC Job # 2017-047

Prepared For:

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CEQA Checklist

NOISE AND VIBRATION – **Would the Project Result in:**	**NA – Not Applicable**	**Potentially Significant Impact**	**Less than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Generation of substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			**X**		
b) Generation of excessive groundborne vibration or groundborne noise levels?				**X**	
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?					**X**

Introduction

Kidder Creek Orchard Camp (KCOC) is located at 2700 South Kidder Creek Road in Siskiyou County, CA. Figure 1 shows the KCOC boundaries. Currently KCOC is operating under permit number UP-95-12, which limits activities to a total occupancy of 165, an on-site parking limit of 215, and an average daily traffic volume of 131 vehicles.

Activities and programs currently occurring at KCOC include camping, equestrian riding, archery, crafts, a ropes course, rifle shooting, an adventure course, paintball, and swimming activities at the pond area. The existing camp configuration, which indicates the locations of these activities, is shown on Figure 2.

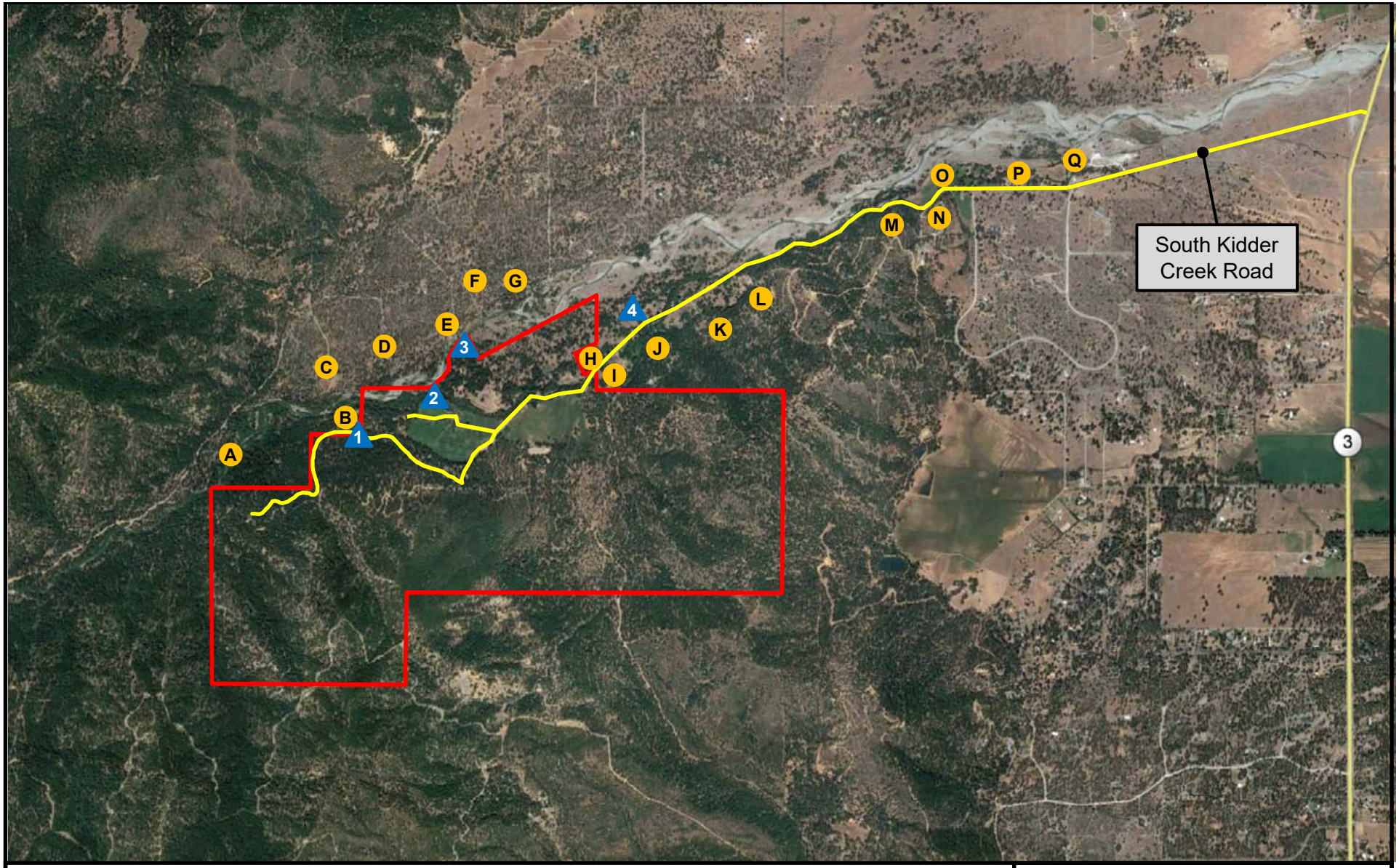
The strategic plan for the KCOC includes enhancing the activities and programs offered by providing improved facilities and accommodations, enhancing the visual appearance of the camp property, improving safety by separating vehicle and pedestrian traffic, and creating a flexible layout that accommodates phased construction. The proposed site plan is shown on Figure 3.

Comparison of the existing camp configuration on Figure 2 against the proposed configuration (project) shown on Figure 3 indicates the changes would primarily consist of the following:

- The creation of a new 7-acre pond for water recreation activities (no motorized watercraft)
- Moving and expanding the equestrian area, and construction of a covered riding arena
- Construction of new cabins
- Construction of two new RV parking areas
- Construction of a new welcome center/dining facility
- Creation of new base camp areas
- Creation of amphitheater areas
- Relocation of the existing sawmill area (to accommodate new pond)
- Installation of a Zip Line

Many of the activities occurring with the KCOC boundaries are not substantive noise sources. Examples of relatively quiet activities include equestrian activities, base camp area activities (with most campers using these areas for eating and sleeping while not engaged in off-site activities such as rafting, hiking, backpacking, etc.), archery, RV parking (generators are not used), ropes course, crafts, etc.

Noise sources associated with existing and proposed KCOC operations include kids playing/shouting while engaged in water activities in the existing pond area and anticipated increased activity in the proposed new pond area, playing field activities (soccer), future amphitheater usage for camp assemblies and/or activities (i.e. movie night), zip-line usage and project-generated traffic.



Legend

- # — Ambient Noise Measurement Sites
- X — Nearest Noise-Sensitive Receivers (Residences)
- Project Site Boundary (approximate)

N

Scale (miles)

0 0.25 0.5

KIDDER CREEK ORCHARD CAMP EXPANSION PROJECT

Siskiyou County, California

Project Area, Noise Measurement Locations, and Noise-Sensitive Receivers

Figure 1

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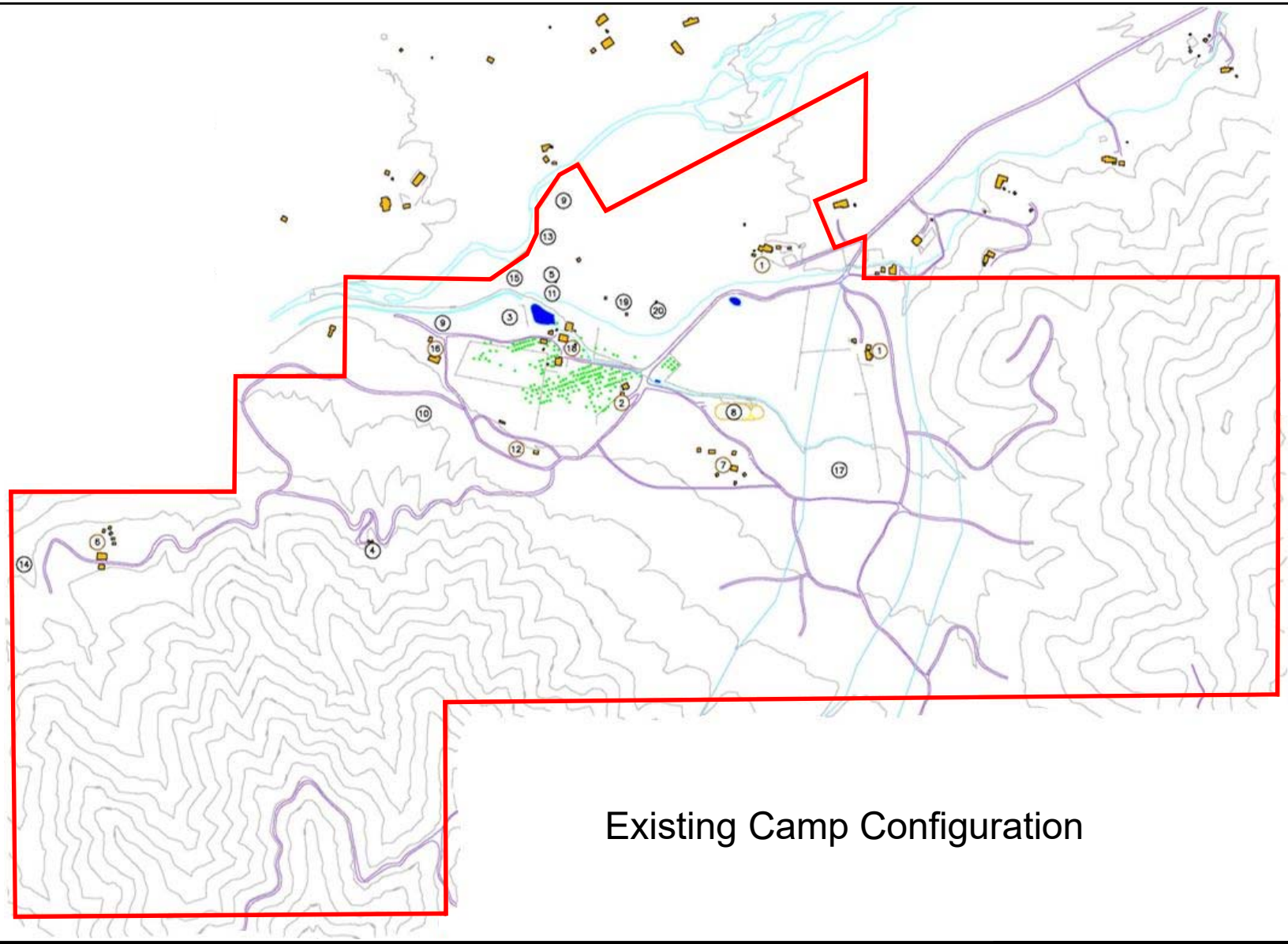

Existing Camp Configuration

Legend

1 – Staff Residence
2 – Welcome Center
3 – Small Pond & Rec Area
4 – Water Storage Tank
5 – Water Well
6 – Timber line Camp
7 – Ranch Camp
8 – Equestrian Area
9 – Base Camps (2)
10 – Archery Course
11 – Craft Area
12 – RV Area
13 – Ropes Course
14 – Rifle Range
15 – Adventure Course
16 – Staff House & Retreat
17 – Paintball Course
18 – Multi-Use Area
19 – Sawmill/Storage Area
20 – Fuel & Waste Disposal
Septics
Ponds, Ditches, Creeks
Existing Structures
Orchard
Roads
Project Boundary

Scale (Feet)
0 750 1,500

N

KIDDER CREEK ORCHARD CAMP EXPANSION
Siskiyou County, California
Project Site Plan - Existing

Figure 2

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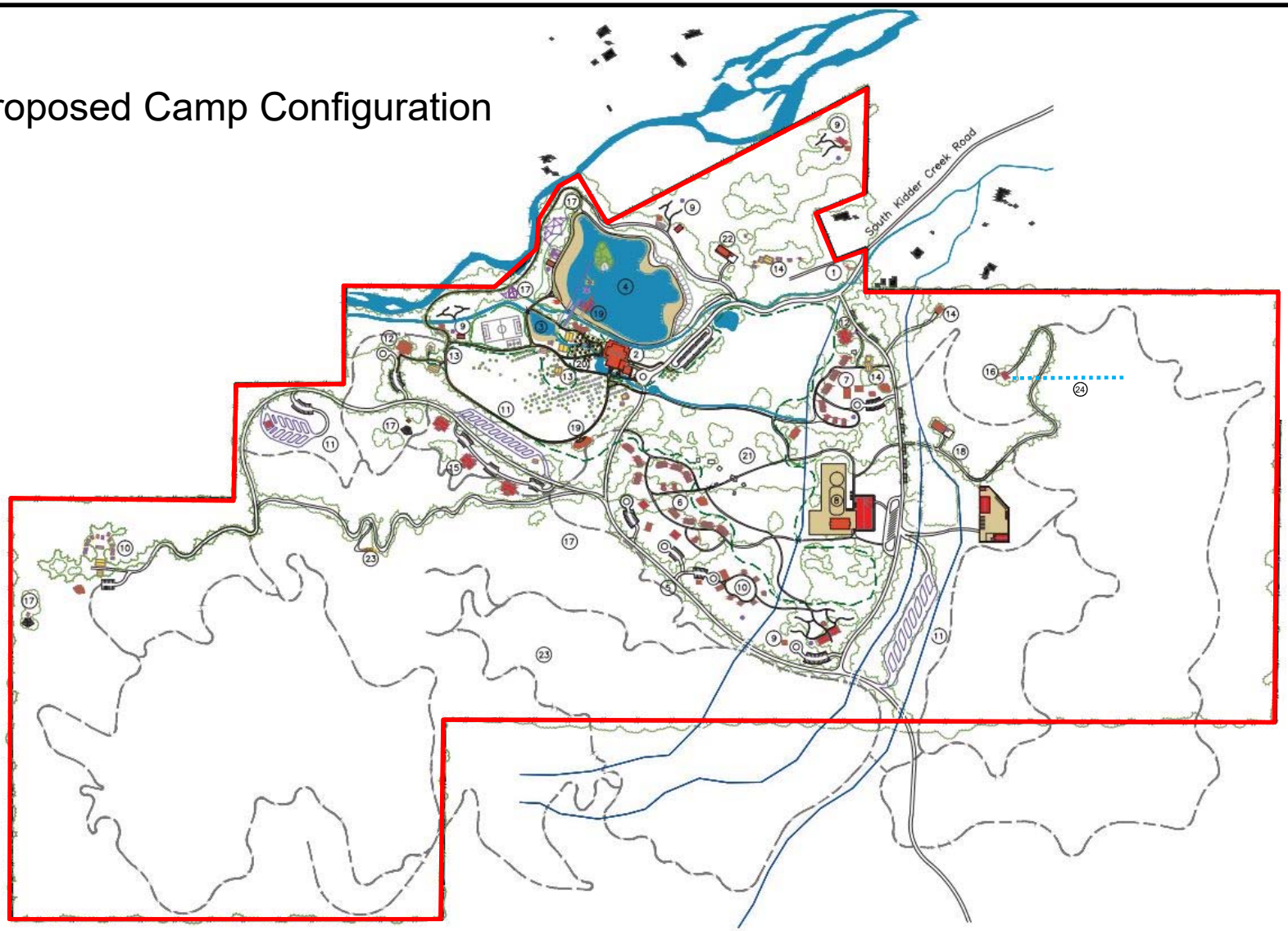
Proposed Camp Configuration



Legend

1 – Main Entrance
2 – Welcome Center
3 – Small Pond & Rec Area
4 – Large Pond & Rec Area
5 – Perimeter Road
6 – The Pines
7 – Ranch Camp
8 – Equestrian Area
9 – Base Camps (4)
10 – High Adventure Camps
11 – Craft Area
12 – RV Areas (3)
13 – Staff/Guest Houses (3)
14 – Staff Residences (3)
15 – Adult Retreat Centers (3)
16 – Worship Pavilion
17 – Rec Areas
18 – Maintenance Facility
19 – Amphitheatre (2)
20 – Picnic Area/Park
21 – Green Belt
22 – Sawmill/Storage Area
23 – Water Storage Tanks
24 – Zip Line
Project Boundaries

Scale (Feet)
0 750 1,500

N

KIDDER CREEK ORCHARD CAMP EXPANSION
Siskiyou County, California
Project Site Plan - Proposed

Figure 3

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Due to the substantial size of the project area, many of the camp facilities and activities are, or will be, located hundreds to thousands of feet from the nearest noise sensitive receptors (residences). However, some proposed camp facilities and activities, such as the proposed 7 acre pond, will be located in relatively close proximity to some existing residences. The existing residences are located primarily to the north of the KCOC boundaries, as well as along South Kidder Creek Road. The locations of the twelve (17) nearest residences to the project site and South Kidder Creek Road are shown on Figure 1.

Due to the potential noise generation of project construction and operations, and the potential vibration generation during project construction (no appreciable vibration generating activities occur at the project site), KCOC has retained Bollard Acoustical Consultants, Inc. (BAC) to prepare this analysis of potential noise and vibration impacts resulting from the proposed project. Specifically, the purposes of this analysis are to quantify existing ambient noise and vibration levels in the immediate project vicinity, to assess changes in noise and vibration levels which would result from the proposed project, to compare those changes against applicable CEQA and Siskiyou County criteria, and, if necessary, to recommend appropriate noise and/or vibration mitigation measures to reduce any identified impacts to a level of insignificance. The report contains the results of BAC's analysis.

It should be noted that this report represents a revision to the project noise and vibration analysis prepared for this project by BAC in October of 2017. The revisions were required due to recent changes in the California Environmental Quality Act (CEQA) noise guidelines and due to the inclusion of a Zip Line which was not proposed at the time of the 2017 report. In addition to these revisions, additional revisions are provided to address public comments on the 2017 noise study. The comments were contained within a September 20, 2019 letter from Dale La Forest & Associates. That comment letter is on file with Siskiyou County and is incorporated in this report by reference.

Noise & Vibration Fundamentals

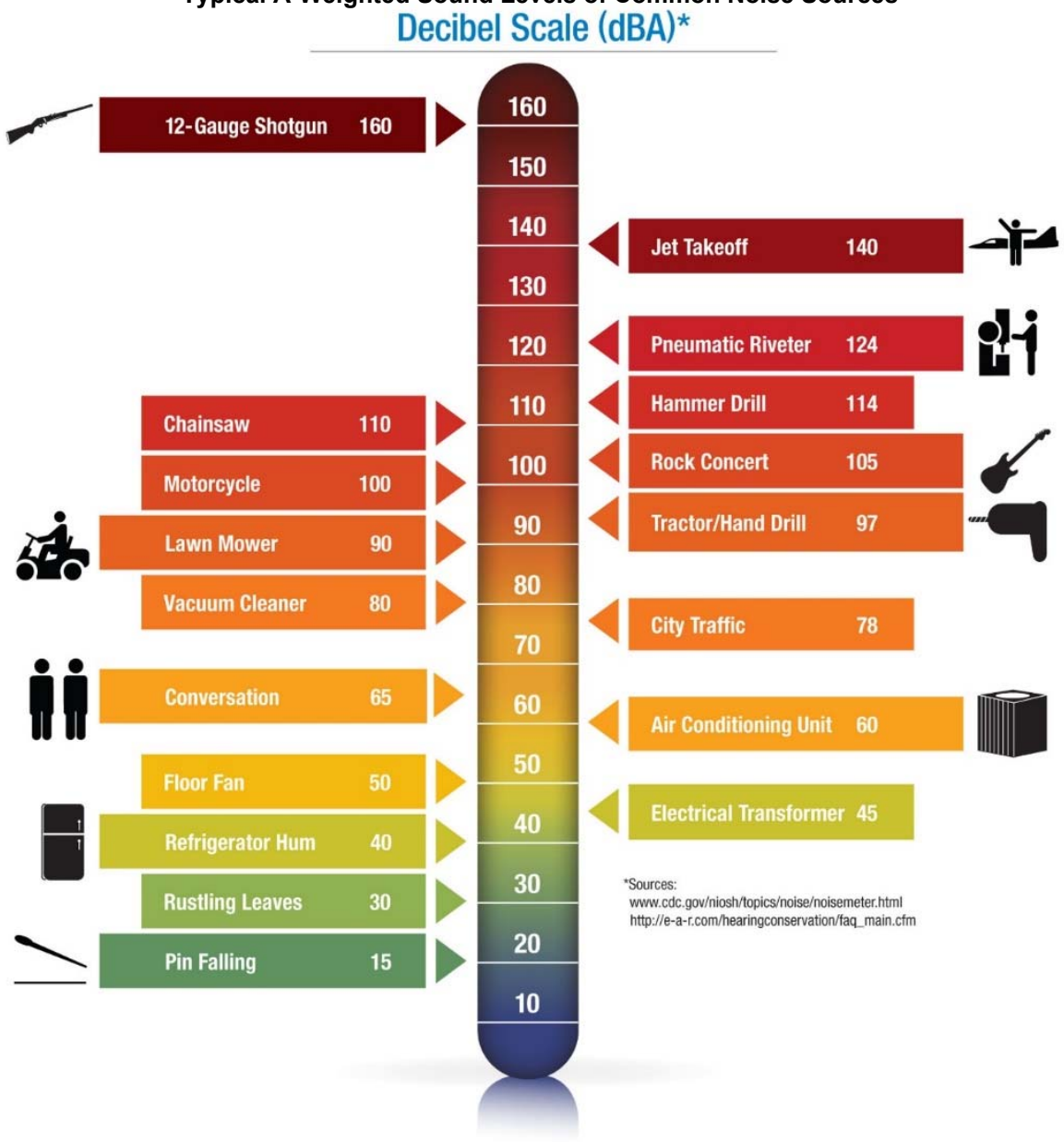
Noise

Noise is often described as unwanted sound. Sound is defined as any pressure variation in air that the human ear can detect. If the pressure variations occur frequently enough (at least 20 times per second), they can be heard and are called sound. Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. As a result, the decibel scale was devised. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB. Another useful aspect of the decibel scale is that changes in levels (dB) correspond closely to human perception of relative loudness. Appendix A contains definitions of Acoustical Terminology. Figure 4 shows common noise levels associated with various sources.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by weighing the frequency response of a sound level meter by means of the standardized A-weighing network.

There is a strong correlation between A-weighted sound levels (expressed as dBA) and community response to noise. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels in decibels.

Figure 4
Typical A-Weighted Sound Levels of Common Noise Sources



Community noise is commonly described in terms of the "ambient" noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}) over a given time period (usually one hour).The L_{eq} is the foundation of the Day-Night Average Level noise descriptor, DNL, and shows very good correlation with community response to noise generated by transportation noise sources.

The Day-Night Average Level (DNL) is based upon the average noise level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because DNL represents a 24-hour average, it tends to disguise short-term variations in the noise environment. DNL-based noise standards are commonly used to assess noise impacts associated with traffic, railroad and aircraft noise sources.

Vibration

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 velocity in inches per second. Standards pertaining to perception as well as damage to structures have been developed for vibration in terms of peak particle velocity as well as RMS velocities.

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.

According to the Transportation and Construction-Induced Vibration Guidance Manual (Caltrans, June 2004), operation of construction equipment and construction techniques generate ground vibration. Traffic traveling on roadways can be a source of vibration, but traffic rarely generates vibration amplitudes high enough to cause structural or cosmetic damage, or to reach thresholds of annoyance.

Regulatory Setting

State of California

California Environmental Quality Act (CEQA

The State of California has established regulatory criteria that are applicable to this assessment. Specifically, Appendix G of the State of California Environmental Quality Act (CEQA) Guidelines are used to assess the potential significance of impacts pursuant to local General Plan policies, Municipal Code standards, or the applicable standards of other agencies. According to Appendix G of the CEQA guidelines, the project would result in a significant noise or vibration impact if the following were to occur:

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

B. Generation of excessive groundborne vibration or groundborne noise levels?

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

The noise standards of Siskiyou County are presented in the following section. If the project were to result in exceedance of applicable Siskiyou County criteria, a significant noise and/or vibration impact is identified.

CEQA does not define what constitutes a substantial permanent or temporary noise level increase. However, it is generally recognized that a 3 dBA or greater increase in noise levels due to a project would be considered significant where exterior noise levels would exceed 60 dBA (for residential uses). Where pre-project ambient conditions are at or below 60 dB, a 5 dBA increase is commonly applied as the standard of significance.

Because the noise sources consisting primarily of speech or music have been shown to result in a higher degree of annoyance than broad-band noise, many jurisdictions apply a -5 dBA penalty to noise sources consisting primarily of speech or music. In order for project-related noise level increases to not exceed 5 dB, the new noise source cannot exceed existing ambient conditions by more than 3 dBA. For example, when a project noise source generating 53 dBA is added to a baseline ambient noise level of 50 dBA, the resulting baseline plus project noise level is 55 dBA, which constitutes a 5 dBA increase over ambient conditions.

When 5 dBA is subtracted from the allowable project noise level in this example to account for the noise source consisting of speech or music, the project noise generation could not exceed 48 dBA (53 dBA less 5 dBA for speech/music penalty). When the acceptable project noise level of

48 dBA is added to the baseline ambient level of 50 dBA, the resulting combined existing plus project noise level computes to 52 dBA, or a 2 dBA increase over ambient. As a result, for this project, noise impacts are considered potentially significant if the increase in ambient conditions resulting from a noise source consisting primarily of speech or music is 3 dBA or more. For all other noise sources, the threshold of significance used to evaluate project noise impacts is 5 dBA.

It is important to note that the proposed project is an expansion of the existing Kidder Creek Camp. As such, sounds of campers playing, swimming and engaging in various outdoor activities are currently part of the baseline noise environment. This includes periodic sounds consisting of speech and music. Nonetheless, given the sensitivity of the nearby residences, this analysis conservatively applies the more restrictive noise thresholds for sounds consisting of speech or music in evaluating project noise impacts at the nearest residential neighbors to the project site. It should also be noted that audibility is not a test of significance according to CEQA. If this were the case, any project which added any audible amount of noise to the environment would be considered unacceptable according to CEQA. However, CEQA requires a substantial increase in noise levels before noise impacts are identified, not simply an audible change.

The project is not located in the vicinity of either public or private use airports. As a result, CEQA criteria C would not apply to this project.

Siskiyou County General Plan Noise Standards

The Siskiyou County General Plan Noise Element was adopted in 1978. Because the background noise information contained in the Noise Element is 43 years old, it is reasonable to conclude that the ambient noise conditions in the County have increased substantially over that time. Because noise standards developed for General Plan Noise Elements are typically influenced by the ambient conditions present at the time the Noise Element is being prepared, it is also reasonable to conclude that the County's Noise Element policies and standards are conservatively low. Nonetheless, to provide a conservative approach to evaluating project noise impacts, the Siskiyou County General Plan standards and policies adopted in 1978 are used in this analysis.

Chapter 3 of the Siskiyou County General Plan Noise Element is titled "Noise Element Standards and Policy". Table 13 of Chapter 3 of the Siskiyou County General Plan Noise Element contains ranges of acceptable noise levels for a variety of land use types. That table, which is reproduced below as Table 1, identifies acceptable noise environments of 60 dBA DNL for residential land uses. In addition, the Noise Element also identifies that interior noise levels with windows closed, attributable to exterior sources, shall not exceed 45 dBA DNL in any habitable room.

As noted previously, a -5 dBA offset is applied to noise sources consisting primarily of speech or music. As a result, the exterior noise standard utilized to assess noise impacts for sources of noise consisting of speech or music is 55 dBA DNL. The corresponding interior noise standard within nearby residential receptors would be 40 dBA DNL. However, the exterior and interior noise standards applicable to all other noise sources not consisting of speech or music are 60 dBA and 45 dBA DNL, respectively.

Table 1
Land Use Compatibility for Exterior Community Noise

Land Use Category	Noise Ranges (DNL)			
	1	2	3	4
Auditoriums, concert halls, amphitheaters, music halls Passively-used open space (quiet or contemplation areas of public parks)	50	50-55	55-70	70
Residential. All Dwellings including single-family, multi-family, group quarters, mobile homes, etc. Transient lodging, hotels, motels. School classrooms, libraries, churches. Hospitals, convalescent homes, etc. Actively utilized playgrounds, neighborhood parks, golf courses.	60	60-65	65-75	75
Office buildings, personal business and professional services. Light commercial. Retail, movie theaters, restaurants. Heavy commercial. Wholesale, industrial, manufacturing, utilities, etc.	65	65-70	70-75	75

Notes:

Noise Range 1
Acceptable land use. No special noise insulation or noise abatement requirements unless the proposed development is itself considered a source of incompatible noise for a nearby land use (i.e., and industry locating next to residential uses).

Noise Range 2
New construction or development allowed only after necessary noise abatement features are included in design. Noise studies may be required if the proposed development is itself considered a source of incompatible noise for a nearby land use.

Noise Range 3
New construction or development should generally be avoided unless a detailed analysis of noise reduction requirements is completed and needed noise abatement features included in design.

Noise Range 4
New construction or development generally not allowed.

Source: Siskiyou County General Plan Noise Element, Table 13

A comment received on the 2017 noise study stated that the appropriate noise level standard which should be applied to this project is 55 dBA DNL not 60 dBA DNL. The rationale for this comment was a table included in the appendix to the General Plan (Table A-6) which references noise standards utilized in a 1975 General Plan for a different city (City of Richmond, California). This table is not referenced in the Standards and Policy section of the Siskiyou County General Plan, and is inconsistent with the Table 13 noise standards which are contained within the Standards and Policy section of the Siskiyou County General Plan Noise Element. Similar comments have been made regarding the applicability of the 55 dBA DNL standard on other noise studies prepared in Siskiyou County in recent years and the County has rejected that interpretation. As a result, the 60 dBA DNL noise standard is correctly applied in this assessment to sources of noise not consisting primarily of speech or music. As noted previously, where the noise source does consist of speech or music, this analysis applies a 55 dBA DNL exterior noise standard.

Comments received on the 2017 noise study assert that offsets to the County's adopted 60 dBA DNL noise standard (Noise Element Table 13) should be applied based on information contained in Table A-10 in the Technical Appendix to the Siskiyou County Noise Element. Table A-10 is referenced within the Noise Element Standards and Policy section (Noise Element Chapter 3) in paragraph (1) on page 53 of the County Noise Element. That paragraph states the following with respect to Table A-10:

"1. Determine the location of the project with respect to existing noise parameters. Refer to noise contour maps developed in this document for various communities. These maps identify noise effects created by significant generators such as freeways, highways, streets, airports, railroads, and stationary sources. Also note the areas of equal noisiness shown on the maps as existing median ambient levels. In order to accurately determine the existing noise climate it will be helpful to identify current land use. Such maps should be maintained in the Planning Department or field investigation may be required to document the noise climate. Use the estimated median ambient noise generation of various land uses and densities. Require current sound readings if growth appears to have changed the designated ambient noise level for the particular area. Note that corrections may be added to the measured community noise level (CNEL or DNL) according to ***Table A-10, Appendix document****.*

As indicated in the citation above, Table A-10 of the Appendix to the Noise Element is to be used to update and normalize the noise contour maps contained within the County's General Plan Noise Element in cases where growth has occurred which appears to have changed the designated ambient noise level for a particular area. Because the County's General Plan noise contour maps have not been updated since the Noise Element was adopted in 1978, this condition would be applicable to essentially the entire county should the County decide to update their noise contour maps.

It is important to recognize that, in the citation above which references Table A-10 of the Appendix to the Noise Element, there is no mention of using the Table A-10 offsets in the evaluation of a project's noise impacts. As a result, application of the Table A-10 offsets to this noise impact analysis is not warranted. To properly establish ambient noise conditions for this project, BAC relied upon actual ambient noise monitoring rather than outdated and apparently normalized noise contour maps. Because application of the CEQA guidelines requires identification of a noise impact if a project would result in a substantial increase in ambient noise exposure, the approach taken in this analysis (conducting baseline ambient noise measurements) is appropriate.

Vibration Criteria

The Siskiyou County General Plan does not have adopted vibration standards. As a result, Caltrans-recommended criteria are applied for this project, as described below. 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*, provides guidelines for acceptable vibration limits for transportation and construction projects in terms of the induced peak particle velocity (PPV). Those standards are reproduced below in Table 2.

Table 2
Vibration Criteria for Structures

	Maximum PPV (in/sec)	
Structure and Condition	**Transient Sources[1]**	**Continuous or Frequent Intermittent Sources[2]**
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.20	0.10
Historic and some old building	0.50	0.25
Older residential structures	0.50	0.30
New residential structures	1.00	0.50
Modern industrial/commercial building	2.00	0.50

Notes:
1 Transient sources create a single isolated vibration event.
2 Continuous/frequent intermittent sources include repetitive single events.

Current Caltrans research illustrates that there are different thresholds of perception for different types of vibration sources. Section XI(b) of Appendix G of the CEQA guidelines requires that a project result in exposure of persons to, or generation of, *excessive* groundborne vibration levels or groundborne noise levels, for the finding of a significant impact. The CEQA guidelines specifically mention “excessive” vibration, rather than just perceptible vibration. Because the general range at which vibration becomes distinctly to strongly perceptible ranges from 0.1 – 0.50 in/sec ppv (Caltrans 2004), project-generated vibration levels exceeding 0.1 inches/second PPV at the nearest residences are considered significant for this study.

Existing Noise Sources and Ambient Noise Levels

The existing noise environment within the overall project area varies depending on proximity to kidder creek (water noise), South Kidder Creek Road (traffic noise), or various camp activities. To quantify the existing ambient noise environment at locations representative of the noise environment on the project site and at the nearest sensitive receptors to the project site, BAC conducted long-term noise level measurements at four (4) locations indicated on Figure 1 at various times between June 15 and June 30, 2017. Photographs of the noise measurement sites and general camp area photos are included in Appendix D.

Noise measurement Site 1 was specifically selected to be representative of existing ambient conditions at Receptor B, which was located in close proximity. Noise measurement Site 1 was also intended to be representative of ambient conditions at Receptors C, D, F & G, which are located roughly comparable distances from water noise generated by the Kidder Creek flow. Because ambient noise measurement Site 1 was completely removed from Kidder Creek Camp activities occurring during the noise survey, it is representative of baseline ambient conditions experienced at the nearest residential receptors in the absence of camp-generated noise.

Noise measurement Site 2 was specifically selected to capture the noisiest on-site aspects of KCOC operations. Specifically, Site 2 was located 130 feet from the center of the existing pond where swimming activities currently occur, and 270 feet from the center of the soccer field. This data was used to project noise impacts at the nearest residences resulting from both existing operations and the creation of the new pond area.

Noise measurement Site 3 was specifically selected to be representative of average ambient conditions at Receptor E, as that receptor and the sound level meter at Site 3 were located equal distances from Kidder Creek generated flow noise. Because there was no camp or other typical human activity in the vicinity of Site 3, maximum noise levels measured at that location are believed to be lower than maximum noise levels occurring at Receptor E, which would include neighborhood-generated noise in addition to Kidder Creek flow noise. As a result, maximum noise level data collected at noise measurement Site 1 was used to assess noise impacts at Receptor E relative to CEQA guidelines. That assessment is included in a subsequent section of this report.

Noise measurement Site 4 was specifically selected to capture traffic noise on South Kidder Creek Road. The microphone located at measurement Site 4 was approximately 100 feet from the centerline of South Kidder Creek Road. That data was used to extrapolate existing ambient conditions at the existing residences located along that roadway. Because monitoring Site 4 was located in relatively close proximity to the Kidder Creek Camp entrance, with the exception of traffic generated by residential receptors “H” and “I”, all traffic noise monitored at Site 4 was generated by Camp traffic. At other residences located further from the camp entrance, the contribution of noise generated by non-camp traffic would be greater as traffic generated by those intervening residences would be greater.

A comment was received that the ambient noise survey conducted for the 2017 noise study was inadequate because measurements were not conducted at all 12 of the nearest homes to the Camp location. However, industry protocols do not require the monitoring of noise at each individual residence in a project vicinity if it can be reasonably determined that groups of residences have acoustical equivalence and can be represented by an ambient noise monitoring location with similar acoustical equivalence. Such is the case for this project. In addition, in the case of locations affected primarily by traffic noise, measurements conducted at a fixed distance to the roadway can be extrapolated to establish ambient conditions at unmonitored locations which are located different distances from the roadway than the noise measurement site.

As described above, ambient monitoring sites utilized for this assessment were specifically selected to be representative of either ambient conditions at nearby sensitive receptors (residences), locations which could be used to extrapolate ambient conditions at sensitive receptor locations, or at locations used to establish reference noise generation levels for the project. This approach has been utilized by BAC in hundreds of CEQA evaluations in the past 20+ years, all of which have been certified as CEQA compliant by lead agencies in the State of California.

Larson Davis Laboratories (LDL) Model 820 and 831 precision integrating sound level meters were used for the noise level measurements. The meters were calibrated before use with an LDL Model CAL200 acoustical calibrator to ensure the accuracy of the measurements. The sound level meters were placed in the field on June 15th, 2017, and retrieved on July 3, 2017, for a total monitoring period of 18 days. During the noise monitoring period, KCOC staff reported that normal camp operations were in effect.

It should be noted that, although the four (4) sound level meters were in the field for 18 days, due to both battery life and sound level meter memory constraints, the actual duration of time monitoring at each location varied. Specifically, 11 complete days were logged at Site 1, 10 complete days were logged at Site 2, 15 complete days were logged at Site 3, and 18 complete days were logged at Site 4. The data collected represents a statistically significant sample of ambient data at each of the four locations, and provided sufficient data to establish baseline conditions for this study. The ambient noise measurement results are summarized in Table 3 with the detailed results provided in a graphical format in Appendix B.

Table 3
General Ambient Noise Measurement Results Summary[1]
Kidder Creek Orchard Camp Expansion – Siskiyou County, CA

Site[2]	Date	Average Noise Level (dBA L_{eq}) Daytime[3]	Average Noise Level (dBA L_{eq}) Nighttime[4]	Maximum Noise Level (dBA L_{max}) Daytime[3]	Maximum Noise Level (dBA L_{max}) Nighttime[4]	Day-Night Average (dBA DNL)
1	6/15/17	44	42	66	50	49
	6/16/17	44	42	63	54	49
	6/17/17	43	41	63	51	48
	6/18/17	45	42	64	56	50
	6/19/17	44	42	66	50	49
	6/20/17	43	41	60	50	48
	6/21/17	43	41	63	50	48
	6/22/17	43	42	63	56	49
	6/23/17	44	43	65	54	50
	6/24/17	43	41	63	53	48
	6/25/17	46	40	66	51	49
	Average	**44**	**42**	**64**	**52**	**49**
2	6/23/17	55	52	72	58	60
	6/24/17	53	53	68	60	60
	6/25/17	53	52	61	56	59
	6/26/17	59	51	77	53	62
	6/27/17	57	51	75	55	61
	6/28/17	53	52	67	57	60
	6/29/17	54	52	69	55	60
	6/30/17	56	51	73	54	59
	7/1/17	52	51	66	55	57
	7/2/17	52	50	63	57	58
	Average	**54**	**52**	**69**	**56**	**60**
3	6/15/17	50	50	51	51	56
	6/16/17	50	51	53	50	57
	6/17/17	50	51	56	50	57
	6/18/17	50	51	54	50	57
	6/19/17	51	51	52	50	58
	6/20/17	50	51	51	50	57
	6/21/17	49	50	51	50	57
	6/22/17	49	50	52	49	56
	6/23/17	48	50	51	51	56
	6/24/17	49	49	53	50	56
	6/25/17	50	50	56	50	56
	6/26/17	49	50	54	50	56
	6/27/17	48	48	52	50	55
	6/28/17	47	48	51	50	54
	6/29/17	47	48	51	50	54
	Average	**49**	**50**	**53**	**50**	**56**
4	6/15/17	45	42	61	51	49
	6/16/17	44	43	61	53	50
	6/17/17	43	44	60	53	50
	6/18/17	44	45	61	53	51
	6/19/17	43	45	61	53	51
	6/20/17	44	45	61	53	52
	6/21/17	43	44	60	53	51
	6/22/17	43	45	61	52	51
	6/23/17	43	45	61	53	51
	6/24/17	44	44	61	53	50
	6/25/17	46	43	61	56	51
	6/26/17	45	43	63	53	50
	6/27/17	43	43	63	51	50

Table 3
General Ambient Noise Measurement Results Summary[1]
Kidder Creek Orchard Camp Expansion – Siskiyou County, CA

Site[2]	Date	Average Noise Level (dBA L_{eq}) Daytime[3]	Average Noise Level (dBA L_{eq}) Nighttime[4]	Maximum Noise Level (dBA L_{max}) Daytime[3]	Maximum Noise Level (dBA L_{max}) Nighttime[4]	Day-Night Average (dBA DNL)
	6/28/17	43	43	62	52	50
	6/29/17	42	42	63	51	49
	6/30/17	43	42	62	55	50
	7/1/17	43	43	62	59	50
	7/2/17	42	41	61	54	49
	Average	**44**	**43**	**61**	**53**	**50**

Notes:

1 Detailed noise measurement results, are provided in Appendix B
2 Measurement site locations are shown on Figure 1.
3 Daytime hours are 7 AM – 10 PM.
4 Nighttime hours are 10 PM – 7 AM.

Source: Bollard Acoustical Consultants, Inc. (2017)

The Table 3 data indicate that typical measured average noise levels were generally comparable at sites 1 and 4, and highest at site 2. The elevated noise levels at site 2 were due to activities at the existing small pond area and soccer field.

The ambient noise survey results are important because the California Environmental Quality Act (CEQA) criteria require evaluation of project noise generation relative to ambient noise conditions as well as relative to General Plan Noise Element standards. Therefore, ambient noise conditions must be quantified in order to allow the required analysis of relative changes in noise levels due to a project.

The ambient noise level data are also important in that they indicate that measured existing ambient noise levels at Sites 1, 3 and 4, which are considered representative the nearest residences to the project site, were all below the Siskiyou County General Plan noise level standard of 60 dBA DNL during every day of the survey. Because the measurement results included noise generated by existing KCOC activities, it can be concluded that existing KCOC activities were within compliance with the applicable County noise standards during the duration of the ambient noise survey period.

Evaluation of Noise Impacts Resulting from On-Site Activities at the Nearest Residences to the West and North

As mentioned previously, Figures 2 and 3 show the locations of existing and proposed project facilities and activities, respectively. Of the proposed improvements and creation of new facilities, the development of the large pond area at the northern end of the property, the construction of amphitheaters, and the installation of a zip-line have been identified as the primary on-site noise sources associated with the proposed project. As a result, the following analysis focuses on noise exposure from these sources. The noise measurement results and BAC staff observations indicate that the other camp activities and facilities are either not appreciably noise-generating or that they are located in areas well removed or substantially shielded from view of the nearby residences by intervening topography.

An evaluation of off-site traffic noise level increases on South Kidder Creek Road resulting from the project and construction-related noise and vibration levels at the nearest noise-sensitive uses are provided in a later section of this report.

Large Pond Area Activities

The main noise source of concern for this project is noise generated from the proposed large pond area at the northern end of the project site, as identified on Figure 3. The nearest noise-sensitive uses to the proposed pond are identified on Figure 1 as being Receptors D-H.

The primary noise source associated with the proposed large pond area will be shouting campers. For the assessment of large pond area noise generation relative to the Siskiyou County General Plan, BAC utilized the long-term ambient data from measurement site 2, reported in Table 3. As mentioned previously, noise level measurements at Site 2 were considered to be representative of noise generated from camp activities at the existing small pond area at the north end of the project area.

According to Table 3, ambient noise levels measured at Site 2 ranged from 55 to 66 dBA DNL (average of 59 dBA DNL) at a distance of approximately 130 feet from the center of the existing small pond area. In addition, average daytime noise levels at ambient noise measurement Site 2 were 54 dBA Leq at the reference distance of 130 feet from the center of the existing pond. Measured maximum noise levels at Site 2 were 79 dBA. However, because the nearest beach area of the existing pond area was approximately 80 feet from noise measurement Site 2, the reference distance for the projection of maximum noise levels is considered to be this 80 foot distance.

Because average noise levels represent the cumulative contribution of noise from all areas, industry standard convention is to project average noise levels (Leq and DNL) from the effective noise center of the activity area to the potentially affected sensitive receptor locations. Conversely, because maximum noise levels typically result from activities closer to the receptor, common practice is to project maximum noise levels from the portion of the activity area located closest to the sensitive receptor. This common evaluation methodology was employed for this impact assessment.

According to information obtained from the client, the capacity for activities at the large pond will be larger than those currently occurring at the small pond. To account for the increase in future activities at the large pond area, an upward adjustment of +3 dBA was conservatively applied to the measured ambient noise levels measured levels at site 2. Assuming standard spherical spreading loss (-6 dBA per doubling of distance), future noise exposure was projected from the center of the proposed large pond area to the nearest noise-sensitive uses (residences). The results of those projections are presented in Table 4.

Impact Assessment Relative to the Siskiyou County General Plan Noise Criteria

Table 4
Predicted Large Pond Area Noise Generation at Nearest Residences
Kidder Creek Orchard Camp Expansion – Siskiyou County, California

Receptor[1]	Distance to Center of Large Pond & Recreation Area (feet)[2]	Predicted Exterior Noise Level, DNL (dBA)[3]	Exceedance of County 55 dBA DNL Noise Standard?
D	1,500	42	No
E	900	46	No
F	1,500	42	No
G	1,400	42	No
H	1,400	44	No
Siskiyou County Exterior Noise Standard (Residential):	**60**		

Notes:
[1] Nearest potentially affected receptors are shown on Figure 1.
[2] Distances measured from center of proposed large pond area to nearest receivers.
[3] Predicted levels are based on a sound attenuation rate of 6 dBA per doubling of distance and a reference noise level of 63 dBA DNL at a distance of 130 feet.
Source: Bollard Acoustical Consultants, Inc. (2017)

The Table 4 data indicate that predicted Day/Night Average Noise Level (DNL) noise exposure from the proposed large pond area would range from 42 to 46 dBA DNL at the nearest sensitive receptors. This range of predicted noise levels would be well below the adjusted Siskiyou County 55 dBA DNL exterior noise level standard applied to noise sources consisting primarily of speech or music (noise generated by large pond activities would consist primarily of speech) at each of the nearest residences. As a result, no additional consideration of large pond area exterior noise mitigation measures would be warranted for this project relative to the adjusted Siskiyou County General Plan noise standard of 55 dBA DNL.

To evaluate project noise exposure within the interior areas of nearby residences relative to the adjusted County interior noise standard of 40 dBA DNL, the noise attenuation of the building façade must be considered. Standard construction (wood or stucco siding, STC-27 windows, door weather-stripping, exterior wall insulation, composition plywood roof), results in an exterior to interior noise reduction of at least 25 dBA with windows closed and approximately 10-15 dBA with windows open. As a result, provided exterior noise levels do not exceed 50 dBA, interior noise levels within the nearest residences would not exceed 40 dBA DNL when windows of the

nearest residences are in the open position. Because the worst-case predicted exterior noise level is 46 dBA DNL at the nearest residence, interior noise levels would be 36 dBA DNL or less within all of the nearest residences using the conservative assumption of 10 dBA provided by the building façade with windows open. Because this level is well below the Siskiyou County 40 dBA DNL interior noise level standard applicable to noise sources consisting of speech of music, no interior noise impacts are identified relative to County noise standards even with windows in the open position. When windows are in the closed position, interior noise levels would be approximately 10-15 dBA further below the County's interior noise standard. As a result, this impact is less than significant.

Assessment Relative to State of California (CEQA) Noise Criteria

For the assessment of large pond area noise generation relative to the CEQA noise criteria, BAC utilized the same methodology described in the previous section except that maximum noise levels were projected from the beach areas of the large pond which are closest to the nearest sensitive receptors. Average hourly noise levels were computed from the effective noise center of the pond area.

Assuming standard spherical spreading loss (-6 dBA per doubling of distance), future average (Leq) noise exposure was projected from the center of the proposed large pond area to the nearest noise-sensitive uses (residences) to the west and north. Maximum noise levels (Lmax) were projected from the nearest beach area adjacent to the large pond area. The results of those projections are presented in Table 5.

Table 5 shows the predicted noise levels from large pond area activities at the nearest existing noise-sensitive receivers to the project site. Table 5 also shows existing ambient conditions, existing ambient conditions plus predicted large pond area noise levels, and the increases in ambient noise levels which would result from activities at the large pond area.

Table 5
Predicted Noise Generation at Nearest Residences & Project-Related Increases
Kidder Creek Orchard Camp Large Pond Area

	Existing Ambient, dBA			Existing Plus Project, dBA			Project-Related Increase		
	L_{eq}	L_{max}	DNL	L_{eq}	L_{max}	DNL	L_{eq}	L_{max}	DNL
D	44	64	49	45	59	50	1	1	1
E	49	53	56	50	57	57	1	1	1
F	44	64	49	45	60	50	1	1	1
G	44	64	49	45	59	50	1	1	1
H	44	61	50	45	59	51	1	2	1

Source: Bollard Acoustical Consultants, Inc. (2017)

As mentioned previously, for noise sources consisting of speech or music, this impact assessment considered a project-related increase of 3 dBA or more to be significant. As shown in Table 5, increases in average hourly (Leq), average daily (DNL), and single-event maximum noise levels at the nearest residences are below the 3 dBA threshold. As a result, no significant impacts from increases in average or maximum ambient noise levels at the nearest residences would result from activities at the proposed large pond area. As a result, this impact is considered less than significant.

Amphitheater Activities

As noted on Figure 3, the Master Plan identifies future amphitheaters at two locations on the project site. The closest proposed amphitheater location would be on the southwest side of the proposed new pond, approximately 1,100 feet from the nearest residence (Receptor E). The other amphitheater location is identified as being approximately 700 feet further south, or 1,800 feet from the nearest residence (Receptor E). Both amphitheater locations indicate that the sound system (presumably a P/A system), would face away from the nearest residences.

Based on the site plans shown in the project description, the seating area of the amphitheaters would be approximately 50 feet deep. Given the relatively small size of the amphitheaters, it is likely that the P/A system associated with either amphitheater would generate maximum noise levels of approximately 80 dBA at a distance of 50 feet from amphitheater speakers. Because the amphitheater speakers would face away from the nearest residences, a noise reduction of at least 10 dBA can conservatively be assumed due to the directionality of P/A speakers.

Based on a sound level decay rate of 6 dBA per doubling of distance from the speakers, sound generated by the amphitheater P/A system (70 dBA at 50 feet) would attenuate to approximately 43 dBA Lmax at the nearest residence from the closest amphitheater and approximately 39 dBA at the further amphitheater location. These predicted sound levels do not include any downward adjustments for shielding by intervening topography or excess vegetation (pine trees).

A computed maximum sound level of approximately 43 dBA at the nearest residence would translate to an DNL of well below 40 dBA, which would be well within compliance with County noise standards. Furthermore, the predicted maximum noise levels would be below existing maximum sound levels currently experienced at the nearest residences and increases in ambient noise levels resulting from the amphitheater areas would be below the 2 dBA threshold. As a result, no adverse noise impacts associated with either amphitheater location are identified relative to either CEQA or Siskiyou County noise criteria provided the following operational parameters of the amphitheaters are adhered to:

1. Amphitheater usage should be limited to daytime hours.

2. Maximum sound output from the amphitheater P/A speakers should be set not to exceed approximately 80 dBA at a distance of 50 feet from the front of the speakers.

Zip Line Activities

Since the preparation of the 2017 noise study for this project, a zip line has been added to the camp grounds at the location shown on Figure 3. The distance from the zip line to the nearest residences (Receptors I, J, K on Figure 1) ranges from approximately 1,000 to 1,250 feet. Noise level measurements of the zip line in normal operation were conducted on January 20, 2020 from a position 100 feet perpendicular to the end of the zip line. This location had a clear line of sight to the zip line. Eight riders were utilized for the zip line noise testing, with 5 adults and 3 children. During the 8 zip line tests, maximum noise levels ranged from 35 to 47 dBA Lmax. Average noise levels were approximately 5 dBA lower than measured maximum noise levels for each zip line event. For a conservative assessment of zip line noise impacts at the nearest sensitive receptors, a maximum noise level of 47 dBA for the zip line was used as a reference level at 100 feet. This level was projected to the nearest residences assuming standard spherical spreading of sound (6 dBA decrease per doubling of distance from the zip line). The predicted zip line noise levels at the nearest residences are provided in Table 6.

Table 6
Predicted Noise Generation at Nearest Residences & Project-Related Increases
Kidder Creek Orchard Camp Large Pond Area

	Existing Ambient, dBA			Existing Plus Project, dBA			Project-Related Increase		
	L_{eq}	L_{max}	DNL	L_{eq}	L_{max}	DNL	L_{eq}	L_{max}	DNL
I	44	61	50	44	61	50	0	0	0
J	44	61	50	44	61	50	0	0	0
K	44	61	50	44	61	50	0	0	0

Source: Bollard Acoustical Consultants, Inc. (2017)

As indicated in Table 6, given the distance between the zip line activities and nearest residences, zip line operations are not predicted to result in a measureable increase in ambient noise levels at those residences. Furthermore, zip line noise levels in isolation were computed to range from 25 to 27 dBA DNL at the nearest residences, which is several orders of magnitude below the Siskiyou County 60 dBA DNL noise standard. With brief periods of zip line riders yelling excitedly during zip line usage, generating maximum noise levels of up to 88 dBA at a distance of 3 feet, predicted maximum zip line noise levels at the nearest residences would range from 36 to 38 dBA, which is also well below baseline ambient conditions. As a result, no adverse noise impacts are identified for zip line operations.

Evaluation of Off-Site Traffic Noise Level Increases Resulting from the Project

Construction of this project would result in increased traffic on South Kidder Creek Road. To establish baseline ambient noise levels at the residences located along South Kidder Creek Road, BAC utilized the long-term ambient data from measurement Site 4. That data is reported in Table 3. The Site 4 data was projected to the distances of the nearest residences to South Kidder Creek Road (Receptors H-L shown on Figure 1).

The project Traffic Impact Analysis (TIA) forecast future traffic volumes on South Kidder Creek Road based on an assumed 844 persons at the Camp, including guests and staff. Based on 844 persons present at the camp, the TIA computed that the peak Saturday project trip generation would be 1,448 daily trips. However, in response to concerns expressed by local residents, KCOC has proposed as a condition of approval that the daily occupancy be limited to 622 persons. Using the same multiplier applied in the TIA, the computed peak Saturday project trip generation computes to approximately 1067 trips.

BAC utilized the Federal Highway Administration Highway Traffic Noise Prediction Model to predict the traffic noise levels at the nearest residences to both the project site (Receptors H through L, as well as the other residences to the northeast, including the closest residence to that roadway (Receptor P located 70 feet from the centerline). Vehicle speeds along South Kidder Creek Road reflect posted speed limits and slowing which must occur for residences located on or near curves in the roadway. The complete listing of FHWA Model Inputs and predicted levels are provided in Appendix C of this report. Table 7 contains the results of the FHWA traffic noise prediction model at the nearest existing residences along Kidder Creek Road between the project site and Highway 3.

Table 7
Predicted Off-Site Traffic Noise Levels at Nearest Residences to Kidder Creek Road
Kidder Creek Orchard Camp Large Pond Area

Receptor	Distance to Centerline	Existing Traffic DNL, dBA	Existing + Project DNL, dBA	Change in Traffic DNL, dBA
H	220	36	41	5
I	270	35	40	5
J	300	36	41	5
K	500	34	39	5
L	380	37	42	5
M	200	40	44	4
N	150	41	46	4
O	70	46	50	4
P	70	50	54	4
Q	300	42	46	4

Source: Bollard Acoustical Consultants, Inc. (2021)

The Table 7 data indicate that the increase in traffic noise levels along Kidder Creek Road resulting from the project expansion would range from 4-5 dBA DNL. However, the baseline ambient noise environment is affected by sources of noise other than Kidder Creek Road, (natural sounds including wind in trees Kidder Creek flow, property maintenance, etc.). For example, Table 3 indicates that the baseline DNL at ambient noise measurement Site 4 averaged 50 dBA whereas Table 7 predicts an existing traffic noise level of 36 dBA DNL at 220 feet (41 dBA DNL at 100 feet). So, although the increase in traffic noise levels resulting from the project computes to 4-5 dBA DNL, the increase in overall baseline ambient noise levels would be considerably lower (i.e., less than 3 dB). Because the overall increase in ambient noise levels at the nearest residences to South Kidder Creek Road would be less than the 5 dBA significance threshold, and because predicted project traffic noise levels would be well below the Siskiyou County 60 dBA DNL exterior noise standard applicable to residential uses, this impact would be less than significant.

Evaluation of Potential Sleep Disturbance Impacts Resulting from the Project

A comment was received that the noise study should include an evaluation of potential sleep disturbance impacts. Such impacts were not thoroughly investigated in the 2017 noise study because the project does not propose any nighttime activities and the overwhelming majority of project traffic is predicted to occur during daytime hours (conservatively assumed to be 95% of project traffic). In addition, traffic generated by residents residing on or near Kidder Creek Road is not precluded from occurring during nighttime hours. Therefore, it is unrealistic to assume that nighttime traffic on Kidder Creek Road does not currently occur. However, because the majority of the Camp traffic occurs during daytime hours, it is unrealistic to assume that a substantial increase in nighttime traffic would result from the project. Although sleep disturbance impacts are predicted to result from this expansion project, BAC recommends that the following measures be included as project conditions of approval to minimize the potential for nighttime noise generation.

3. Camper pick up and drop off hours should be set to avoid the need for traffic on Kidder Creek Road between the hours of 10 pm and 7 am. All other camp traffic should be limited to daytime hours to the maximum extent practical.

4. Quiet periods between the hours of 10 pm and 7 am should be established and strictly enforced by camp personnel.

Evaluation of Construction Noise at Nearest Existing Residences

During project construction, heavy equipment would be used for grading excavation, paving, and building construction, which would increase ambient noise levels when in use. Noise levels would vary depending on the type of equipment used, how it is operated, and how well it is maintained. Noise exposure at any single point outside the project site would also vary depending on the proximity of construction activities to that point. Standard construction equipment, such as graders, backhoes, loaders, and trucks, would likely be used for this work.

The range of maximum noise levels for various types of construction equipment at a distance of 50 feet is presented in Table 8. The noise values represent maximum noise generation, or full-power operation of the equipment. As one increases the distance between equipment, or increases separation of areas with simultaneous construction activity, dispersion and distance attenuation reduce the effects of combining separate noise sources.

Table 8
Construction Equipment Noise Emission Levels

Equipment	Typical Sound Level (dBA) 50 Feet from Source
Air compressor	81
Backhoe	80
Compactor	82
Concrete mixer	85
Concrete pump	82
Concrete vibrator	76
Dozer	85
Generator	81
Grader	85
Impact wrench	85
Jackhammer	88
Loader	85
Pneumatic tool	85
Pump	76
Roller	74
Saw	76

Source: Transit Noise and Vibration Impact Assessment, Federal Transit Administration, Table 12-1. (May 2006)

The existing noise-sensitive uses within the project vicinity are identified on Figure 1. The closest receivers are located approximately 400+ feet from proposed construction activities on the project site. As shown in Table 8, construction activities typically generate noise levels of approximately 80 dBA at a reference distance of 50 feet from the construction activities. The noise levels from construction operations decrease at a rate of approximately 6 dB per doubling of distance from the source. At the nearest residence, located approximately 400 feet away, maximum noise levels from construction activities would attenuate to approximately 60 dBA Lmax. This level is

not expected to substantially exceed existing maximum noise levels currently received by nearby residences. In addition, the majority of project construction operations would occur at distance greater than 400 feet, thereby resulting in even lower noise exposure at the nearest residences. Finally, the analysis of construction noise does not include consideration of excess attenuation of construction noise by intervening vegetation (pine trees), or intervening topography, both of which would further reduce construction noise at the nearest residences.

Given the distance between the nearest residences and project construction activities, the relatively short duration of construction, and the fact that construction activities would be limited to daytime hours, project construction activities are not expected to result in significant adverse noise impacts at the nearest sensitive receptors. Nonetheless, to reduce the potential for annoyance at those nearby residences during construction activities, the following measures are recommended:

- Project construction activities should be limited to daytime hours unless conditions warrant that certain construction activities occur during evening or early morning hours.
- All noise-producing project equipment and vehicles using internal-combustion engines shall be equipped with manufacturers-recommended mufflers and be maintained in good working condition.
- All mobile or fixed noise-producing equipment used on the project site that are regulated for noise output by a federal, state, or local agency shall comply with such regulations while in the course of project activity.
- Electrically powered equipment shall be used instead of pneumatic or internal-combustion-powered equipment, where feasible.
- Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practicable from noise-sensitive receptors.
- Construction site and access road speed limits shall be established and enforced during the construction period.

Evaluation of Construction Vibration at Nearest Existing Residences

During project construction, the heavy equipment would be used for grading excavation, paving, and building construction, would generate very localized vibration in the immediate vicinity of the construction. Based on the project site plan, the distances from the on-site construction activity and nearest existing residences to the project area would be approximately 400+ feet.

To quantify reference vibration levels commonly generated by construction equipment, the publication*, Transportation and Construction Vibration Guidance Manual* (Caltrans, September 2013), was utilized. Table 18 of that publication, which is reproduced below as Table 9, contains reference peak particle velocity data for such equipment.

Table 9
Vibration Amplitudes for Construction Equipment

Vibration Source	Measurement Distance, ft.	Peak Particle Velocity (in/sec)
Vibratory Roller	25	0.210
Large Bulldozers	25	0.089
Loaded Trucks	25	0.076
Jackhammer	25	0.035

Source: Bollard Acoustical Consultants, Inc. (BAC)

The vibration data shown in Table 9 indicate that, with the exception of the vibratory roller, heavy equipment-generated vibration levels are below the thresholds for annoyance and damage to structures even at the very close measurement locations of 25 feet from the operating equipment. As a result, at the nearest residences located hundreds of feet from proposed construction operations, project construction-related vibration levels are expected to be well below the threshold of perception. As a result, no construction-generated vibration mitigation measures would be warranted for this project.

Conclusions & Recommendations

This analysis concludes that, with practical and feasible noise mitigation measures, noise generated by the proposed project would not result in adverse noise impacts relative to CEQA and Siskiyou County noise criteria at the nearest residences. In addition, increases in off-site traffic noise exposure as a result of the project are also predicted to be less than significant at existing noise-sensitive uses located in the vicinity of Kidder Creek Road.

Project construction noise and vibration as a result of the improvements and expansion of the camp are predicted to be less than significant at the nearest noise-sensitive uses to the project area provided the mitigation measures cited under the construction noise section previously in this report are implemented.

Similarly, noise generated at the proposed amphitheater locations is expected to be less than significant at the nearest noise-sensitive uses to the project area provided the mitigation measures cited under the amphitheater noise section previously in this report are implemented.

These conclusions are based on the collected noise level data in the project vicinity, the project site plans shown on Figures 2 and 3, on information contained in the project TIA and noise modeling conducted using the FHWA model. Deviations from the project site plans shown in Figure 3 or the permitting of unusually loud activities could cause future noise levels to differ from those predicted in this analysis. Bollard Acoustical Consultants, Inc. (BAC) is not responsible for exceedances of County or CEQA noise criteria caused by such deviations.

This concludes BAC's noise assessment for the proposed Kidder Creek Orchard Camp Expansion in Siskiyou County, California. Please contact BAC at (916) 663-0500 or paulb@bacnoise.com with any questions regarding this assessment.

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.

IIC Impact Insulation Class (IIC): A single-number representation of a floor/ceiling partition's impact generated noise insulation performance. The field-measured version of this number is the FIIC.

L_{dn} Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.

L_{eq} Equivalent or energy-averaged sound level.

L_{max} The highest root-mean-square (RMS) sound level measured over a given period of time.

Loudness A subjective term for the sensation of the magnitude of sound.

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.

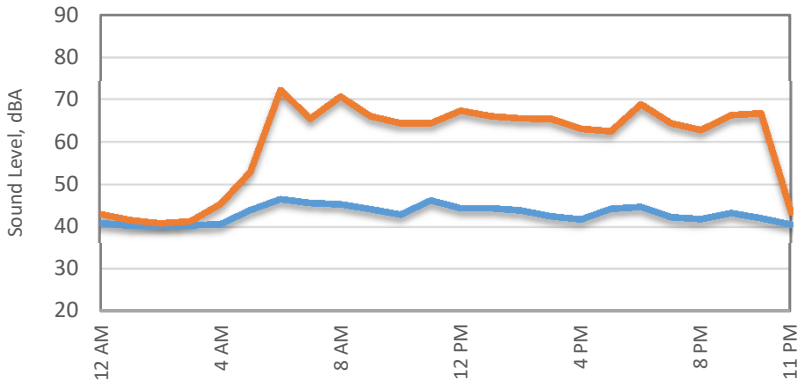
Peak Noise The level corresponding to the highest (not RMS) sound pressure measured over a given period of time. This term is often confused with the "Maximum" level, which is the highest RMS level.

RT_{60} The time it takes reverberant sound to decay by 60 dB once the source has been removed.

STC Sound Transmission Class (STC): A single-number representation of a partition's noise insulation performance. This number is based on laboratory-measured, 16-band (1/3-octave) transmission loss (TL) data of the subject partition. The field-measured version of this number is the FSTC.

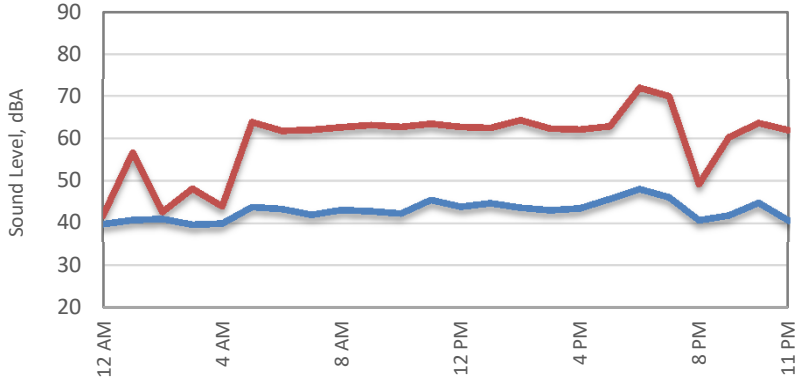
Appendix B-1
Kidder Creek Ambient Noise Monitoring
Thursday, June 15, 2017 - Sunday, June 18, 2017
Site 1

Thursday, June 15, 2017



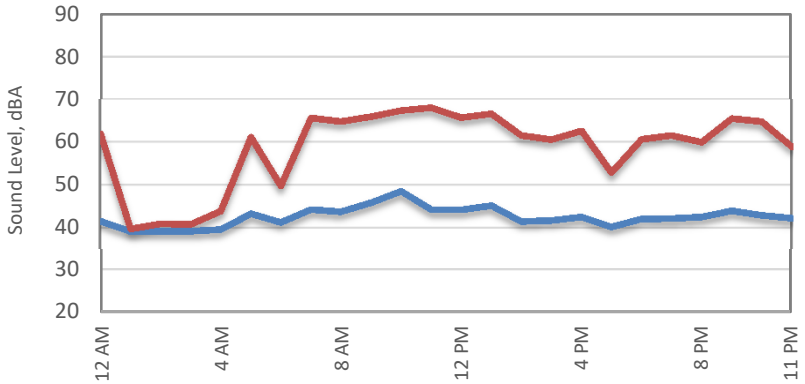
Ldn, dB = 49

Friday, June 16, 2017



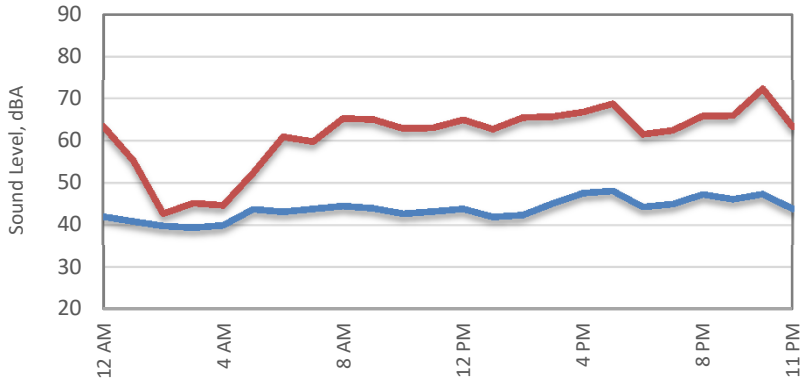
Ldn, dB = 49

Saturday, June 17, 2017



Ldn, dB = 48

Sunday, June 18, 2017



Ldn, dB = 50

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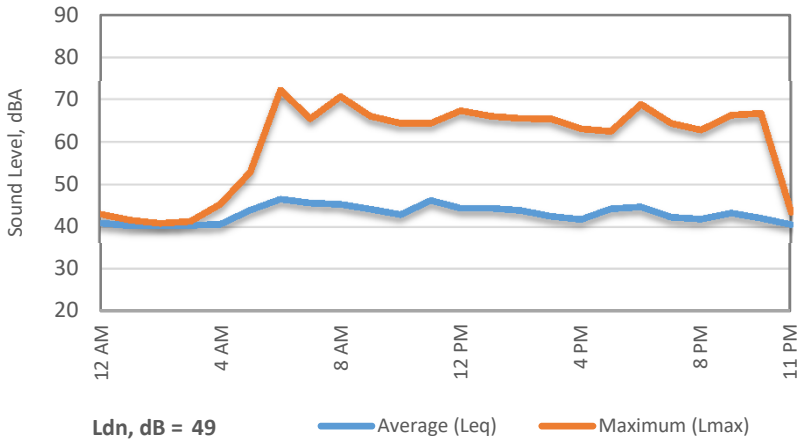
Acoustical Consultants

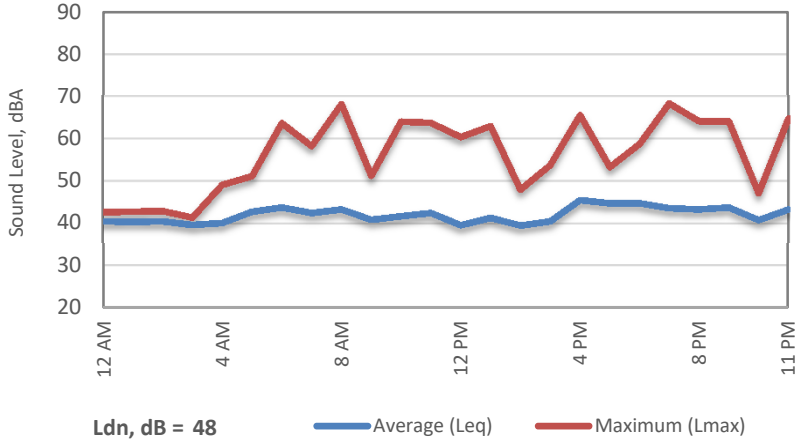
Appendix B-2
Kidder Creek Ambient Noise Monitoring
Monday, June 19, 2017 - Thursday, June 22, 2017
Site 1

Monday, June 19, 2017



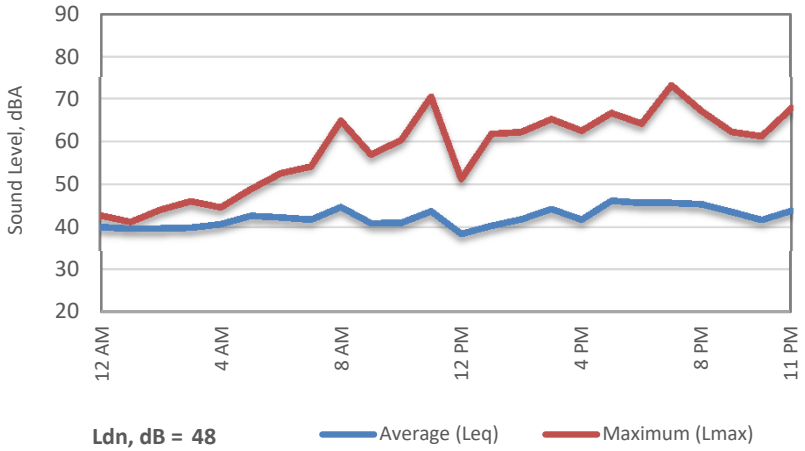
Ldn, dB = 49

Tuesday, June 20, 2017



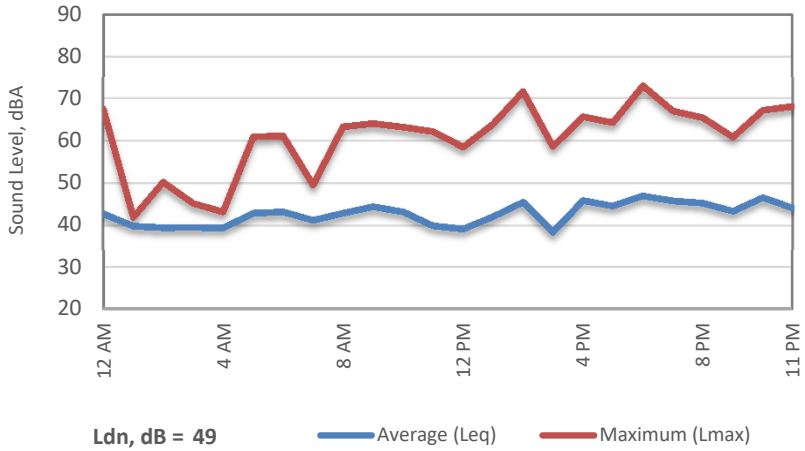
Ldn, dB = 48

Wednesday, June 21, 2017



Ldn, dB = 48

Thursday, June 22, 2017



Ldn, dB = 49

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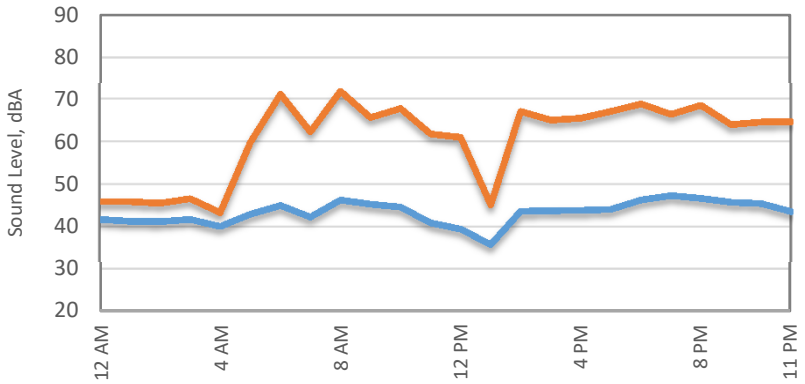
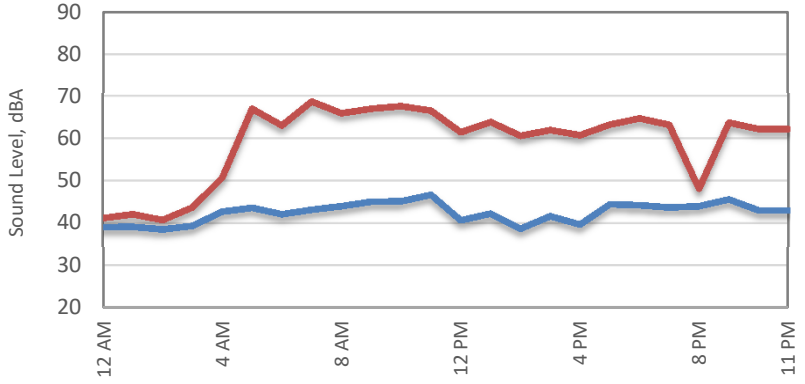
Appendix B-3
Kidder Creek Ambient Noise Monitoring
Friday, June 23, 2017 - Sunday, June 25, 2017
Site 1

Friday, June 23, 2017



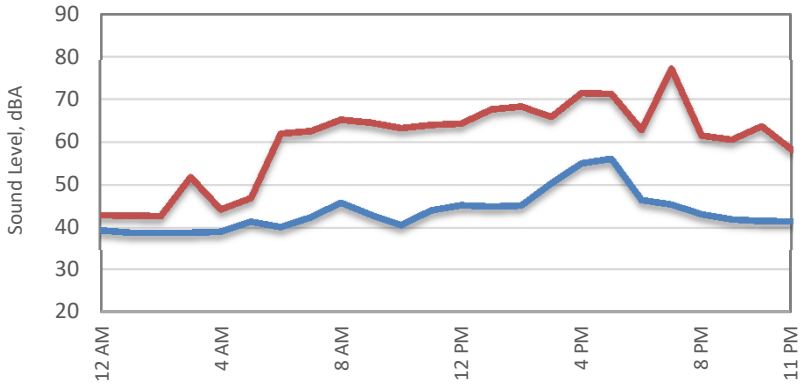
Ldn, dB = 50

Saturday, June 24, 2017



Ldn, dB = 48

Sunday, June 25, 2017



Ldn, dB = 49

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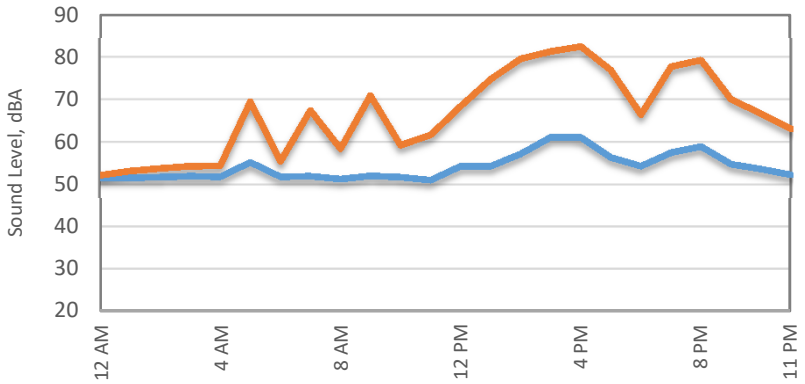
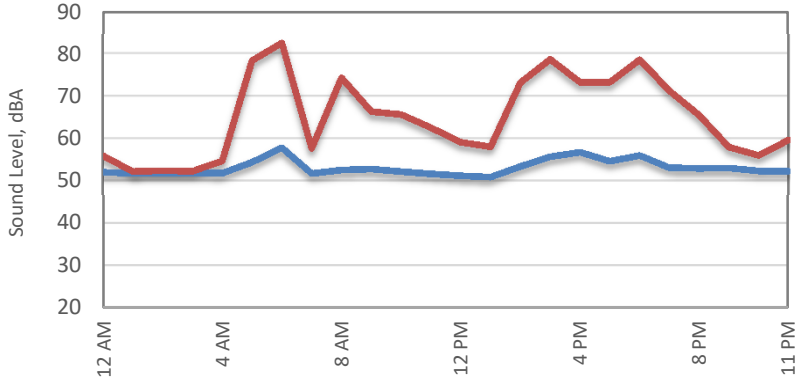
Appendix B-4
Kidder Creek Ambient Noise Monitoring
Friday, June 23, 2017 - Monday, June 26, 2017
Site 2

Friday, June 23, 2017



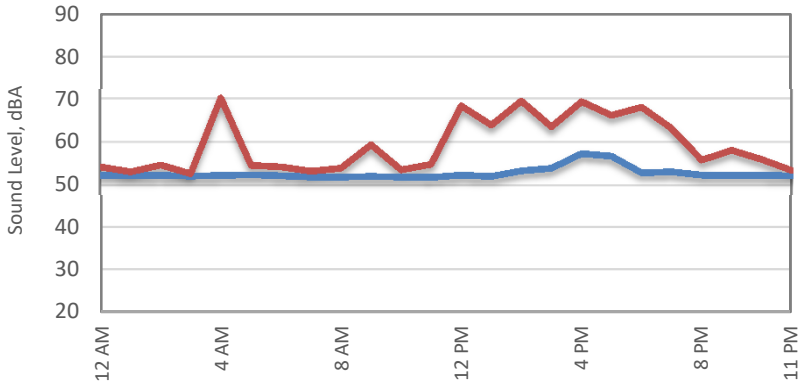
Ldn, dB = 60

Saturday, June 24, 2017



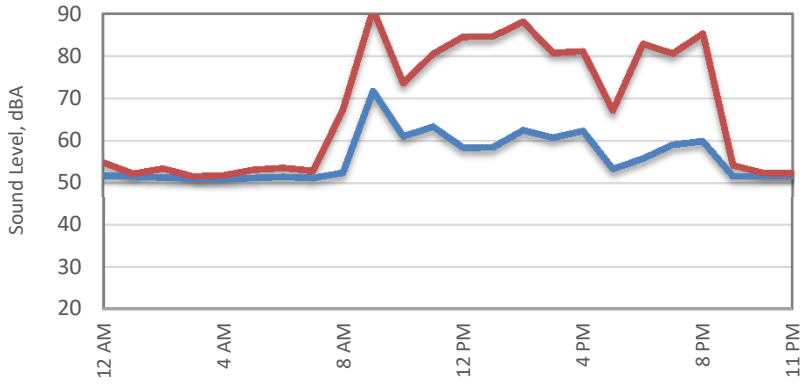
Ldn, dB = 60

Sunday, June 25, 2017



Ldn, dB = 59

Monday, June 26, 2017



Ldn, dB = 62

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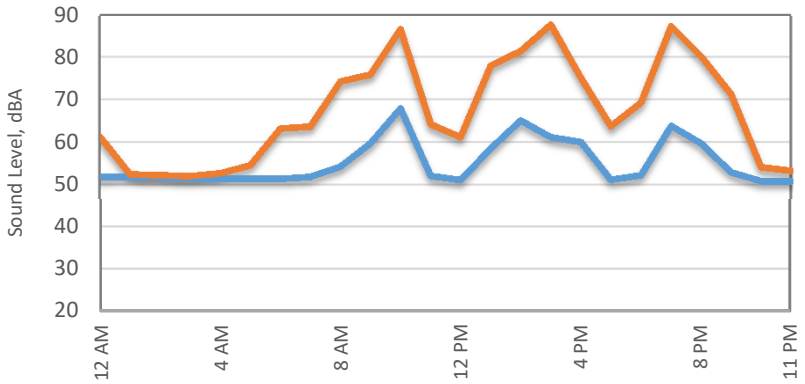
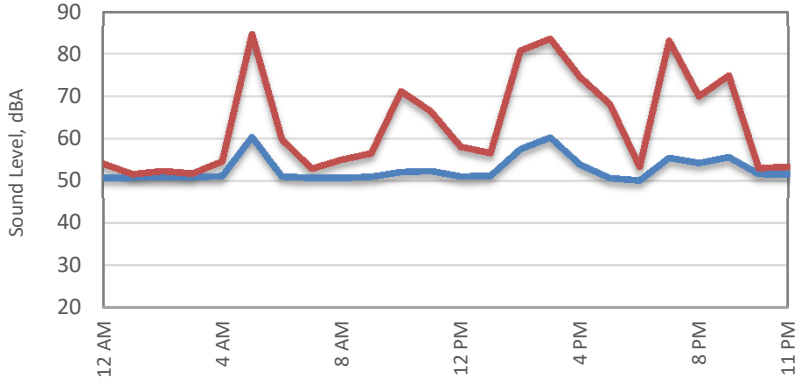
Appendix B-5
Kidder Creek Ambient Noise Monitoring
Tuesday, June 27, 2017 - Friday, June 30, 2017
Site 2

Tuesday, June 27, 2017



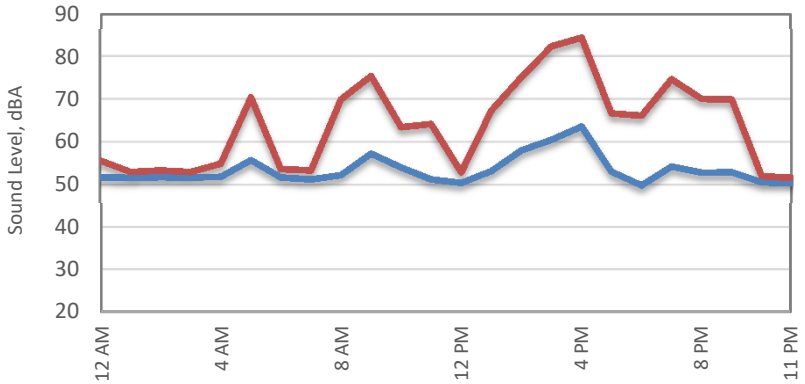
Ldn, dB = 61

Wednesday, June 28, 2017



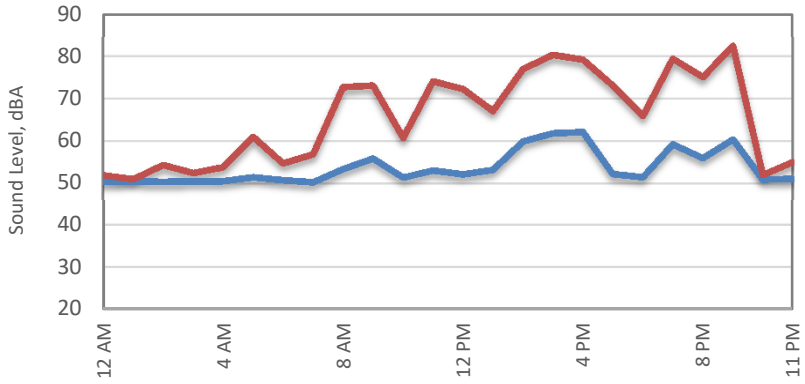
Ldn, dB = 60

Thursday, June 29, 2017



Ldn, dB = 60

Friday, June 30, 2017



Ldn, dB = 59

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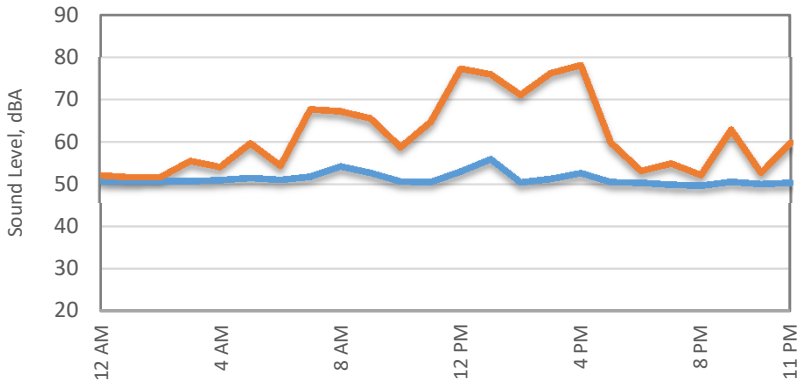
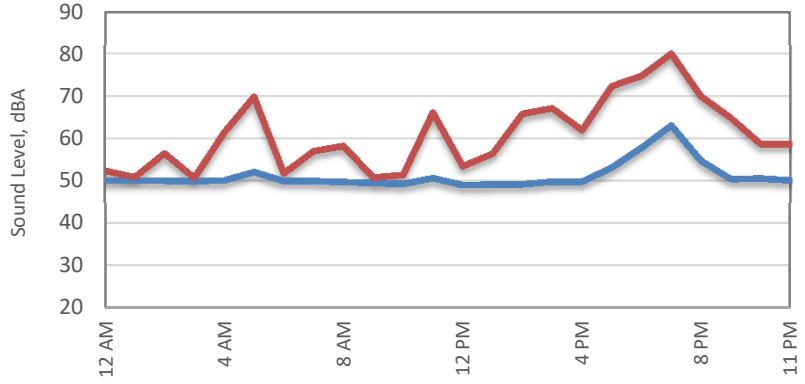
Appendix B-6
Kidder Creek Ambient Noise Monitoring
Saturday, July 1, 2017 - Sunday, July 2, 2017
Site 2

Saturday, July 1, 2017



Ldn, dB = 57

Sunday, July 2, 2017



Ldn, dB = 58

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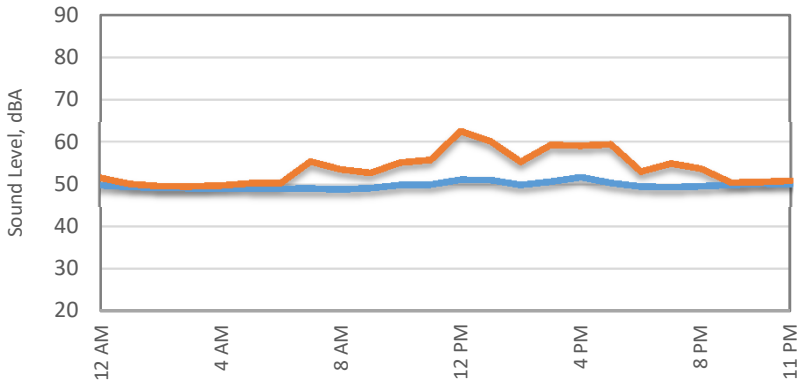
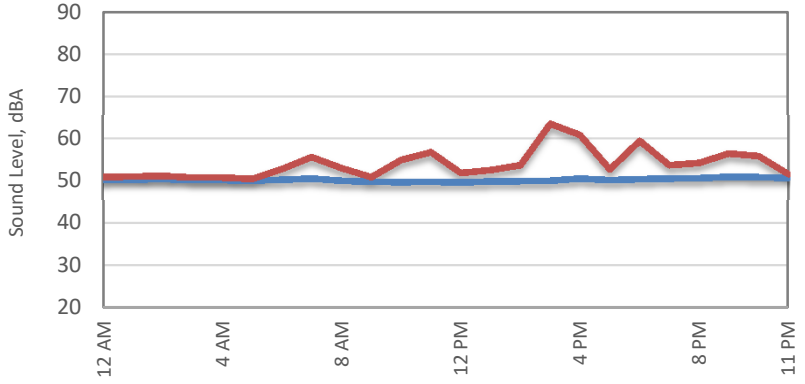
Appendix B-7
Kidder Creek Ambient Noise Monitoring
Thursday, June 15, 2017 - Sunday, June 18, 2017
Site 3

Thursday, June 15, 2017



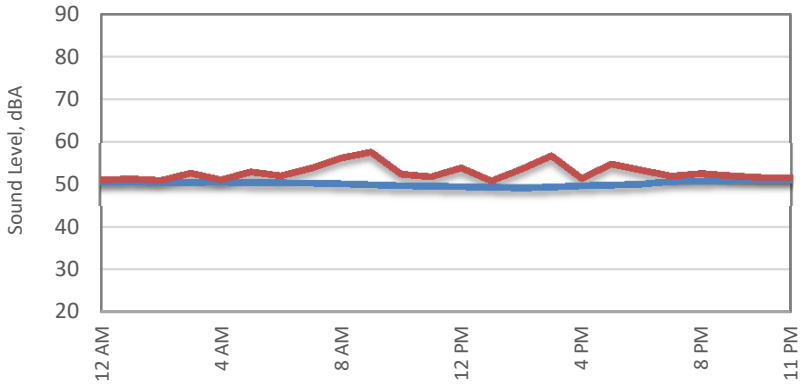
Ldn, dB = 56

Friday, June 16, 2017



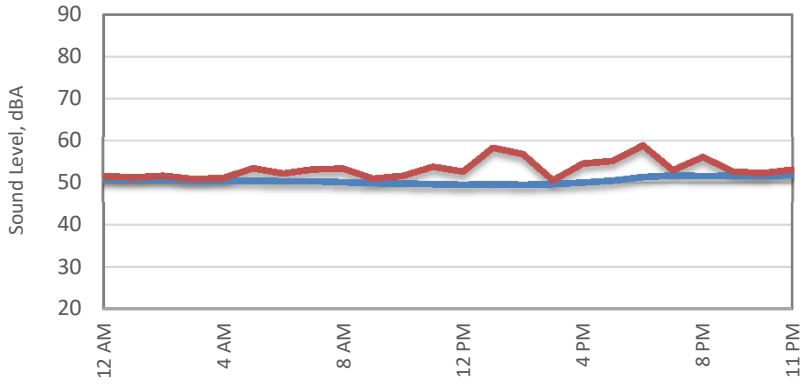
Ldn, dB = 57

Saturday, June 17, 2017



Ldn, dB = 57

Sunday, June 18, 2017



Ldn, dB = 57

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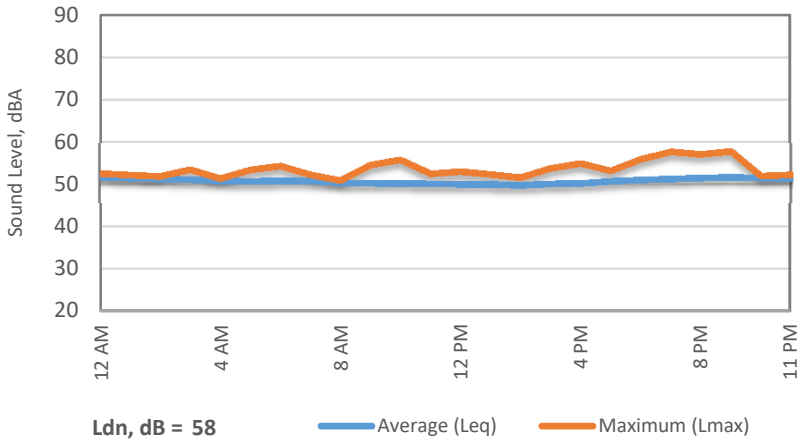
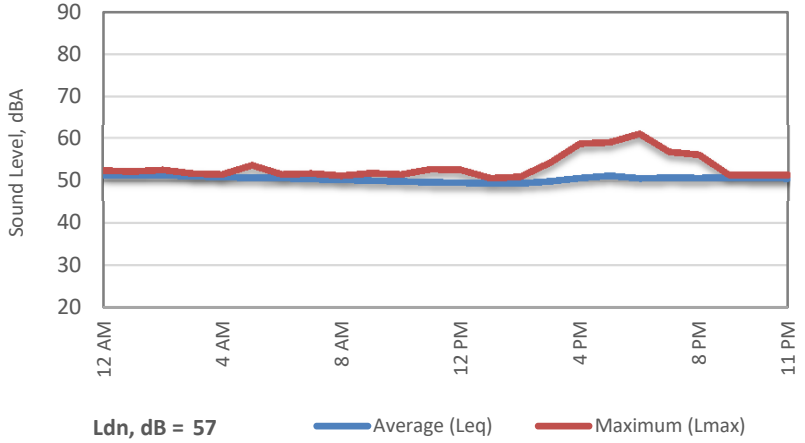
Appendix B-8
Kidder Creek Ambient Noise Monitoring
Monday, June 19, 2017 - Thursday, June 22, 2017
Site 3

Monday, June 19, 2017



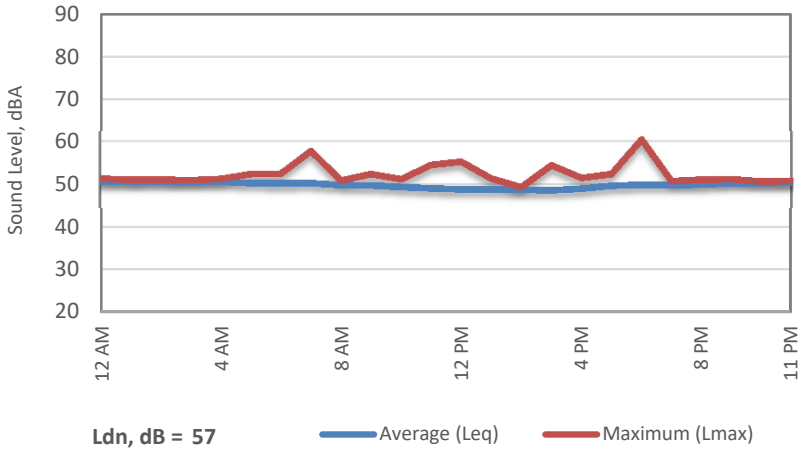
Ldn, dB = 58

Tuesday, June 20, 2017



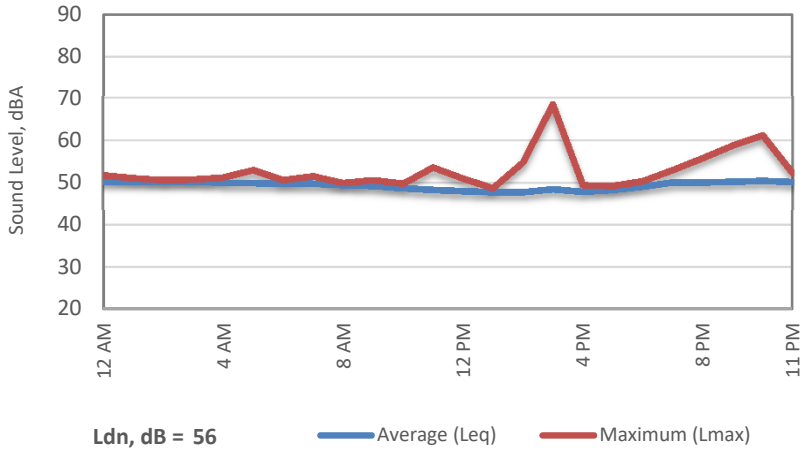
Ldn, dB = 57

Wednesday, June 21, 2017



Ldn, dB = 57

Thursday, June 22, 2017



Ldn, dB = 56

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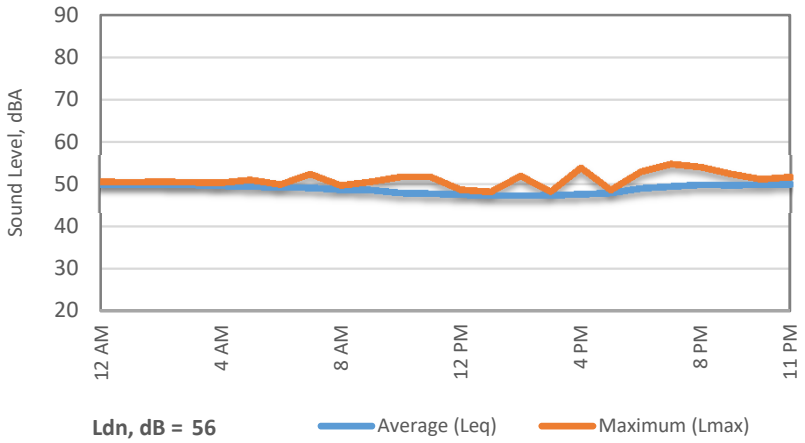
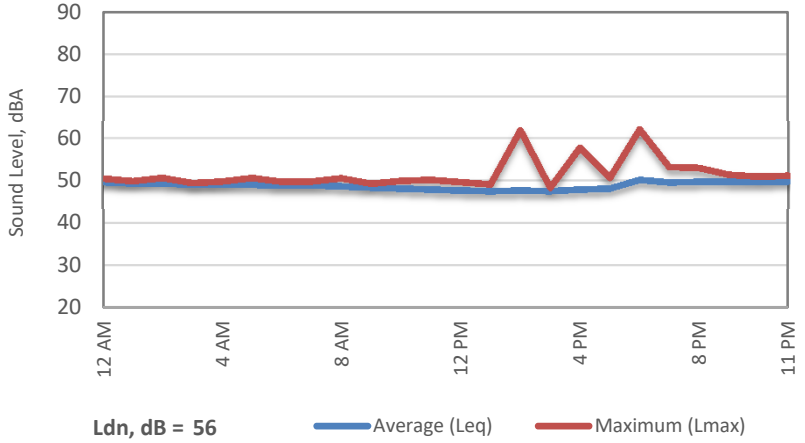
Appendix B-9
Kidder Creek Ambient Noise Monitoring
Friday, June 23, 2017 - Monday, June 26, 2017
Site 3

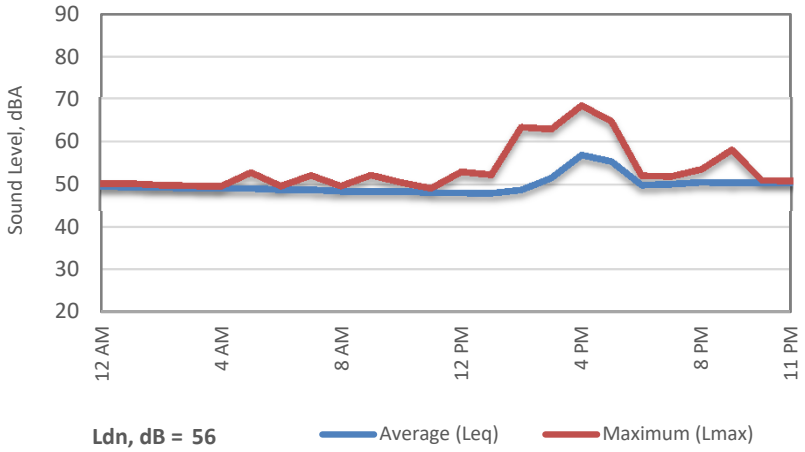
Friday, June 23, 2017



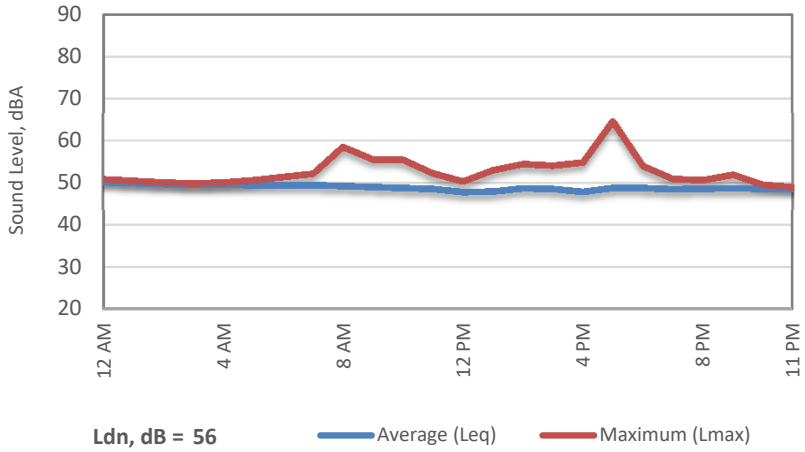
Saturday, June 24, 2017



Sunday, June 25, 2017



Monday, June 26, 2017



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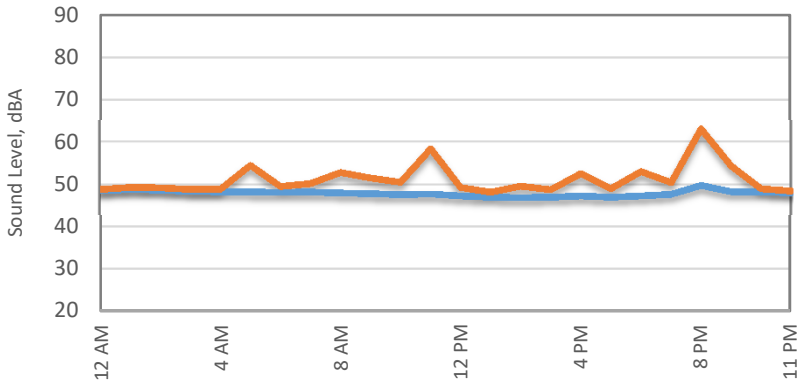
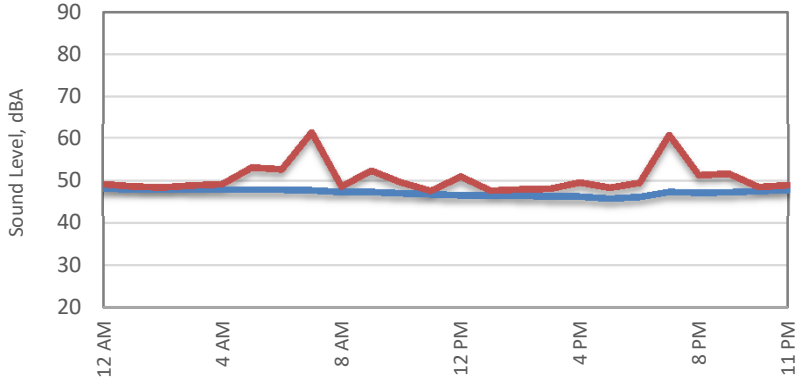
Appendix B-10
Kidder Creek Ambient Noise Monitoring
Tuesday, June 27, 2017 - Thursday, June 29, 2017
Site 3

Tuesday, June 27, 2017



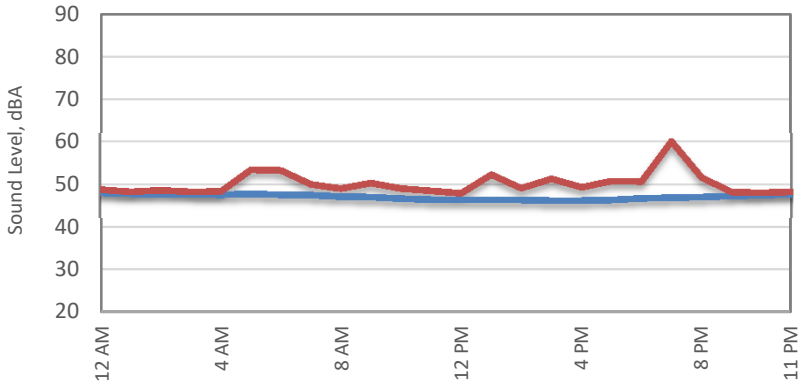
Ldn, dB = 55

Wednesday, June 28, 2017



Ldn, dB = 54

Thursday, June 29, 2017



Ldn, dB = 54

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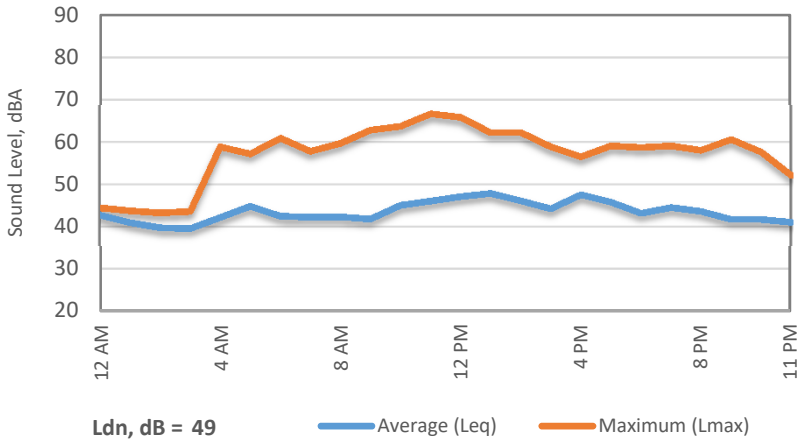
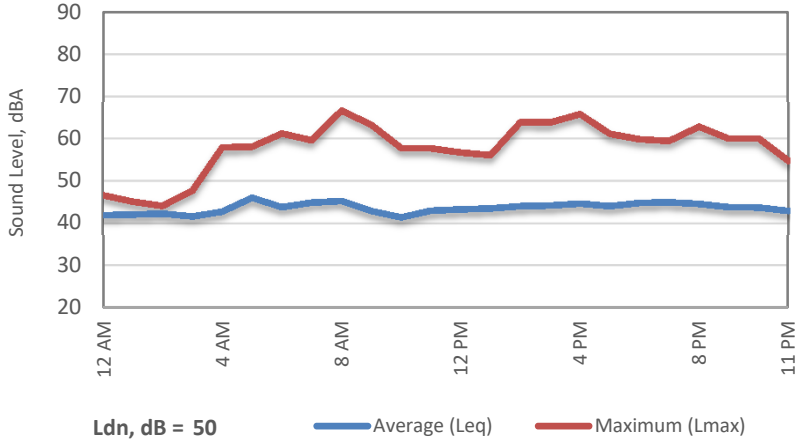
Appendix B-11
Kidder Creek Ambient Noise Monitoring
Thursday, June 15, 2017 - Sunday, June 18, 2017
Site 4

Thursday, June 15, 2017



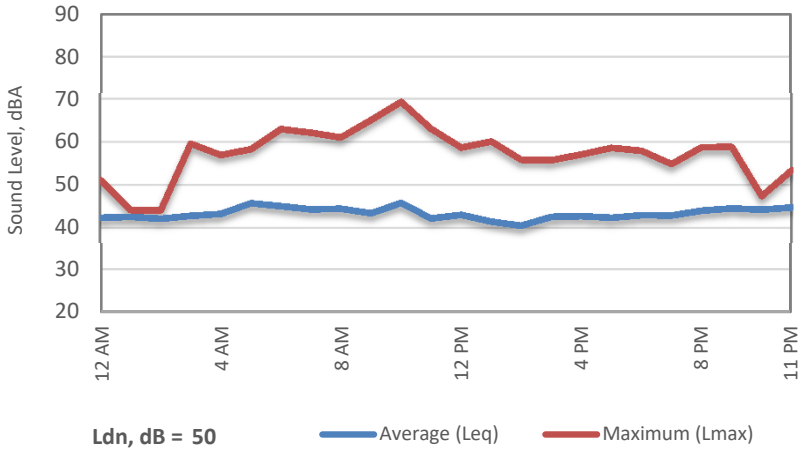
Ldn, dB = 49

Friday, June 16, 2017



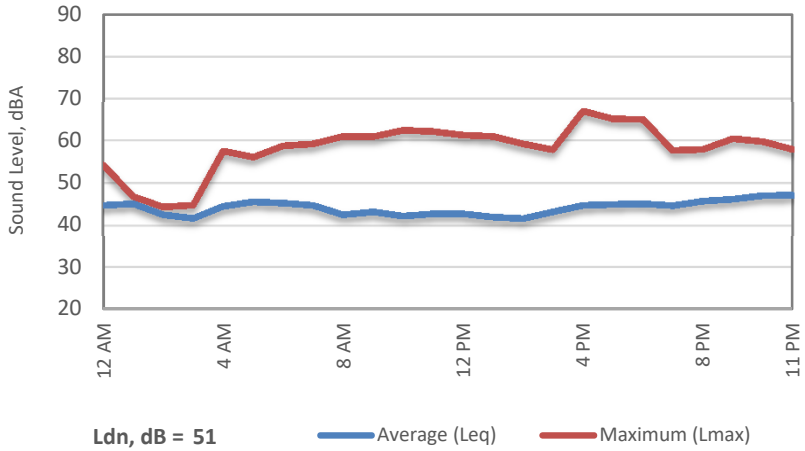
Ldn, dB = 50

Saturday, June 17, 2017



Ldn, dB = 50

Sunday, June 18, 2017



Ldn, dB = 51

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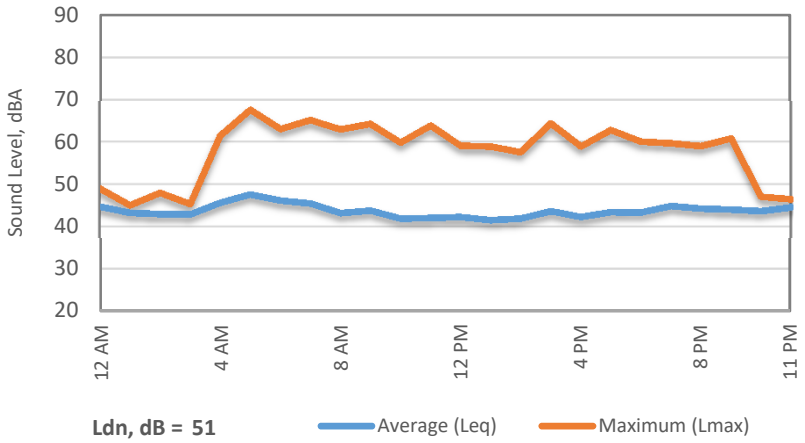
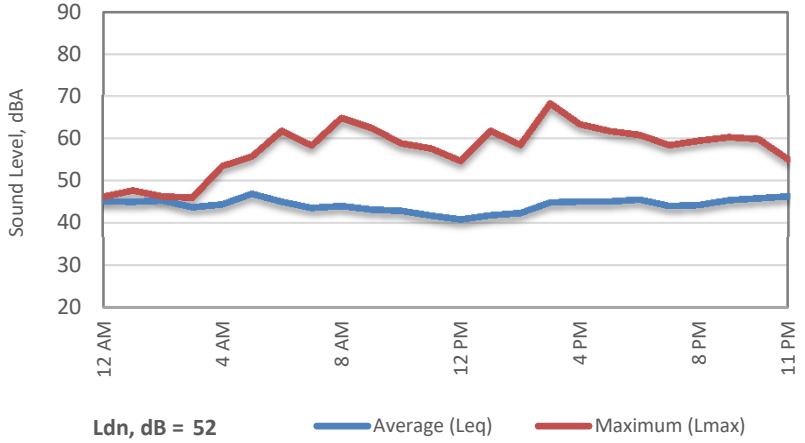
Appendix B-12
Kidder Creek Ambient Noise Monitoring
Monday, June 19, 2017 - Thursday, June 22, 2017
Site 4

Monday, June 19, 2017



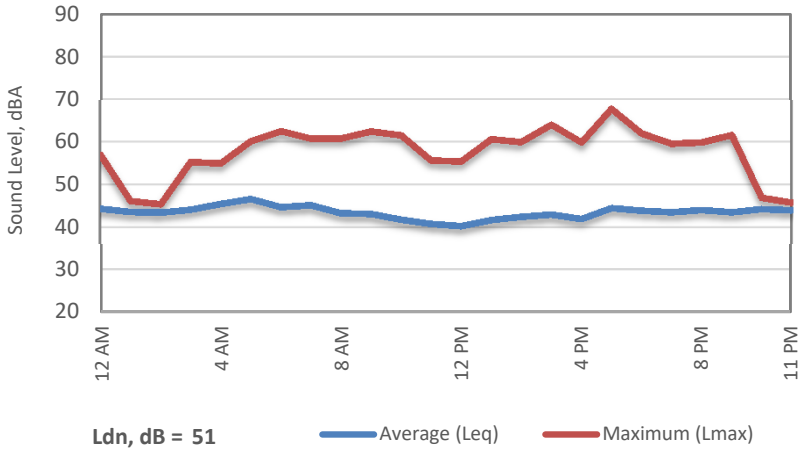
Ldn, dB = 51

Tuesday, June 20, 2017



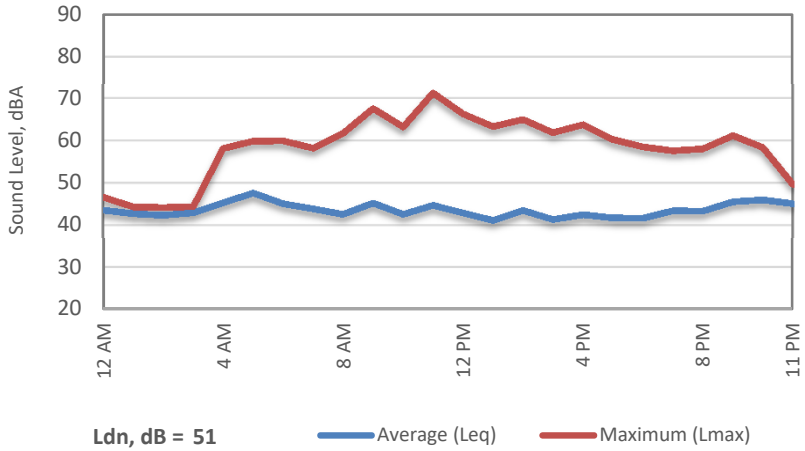
Ldn, dB = 52

Wednesday, June 21, 2017



Ldn, dB = 51

Thursday, June 22, 2017



Ldn, dB = 51

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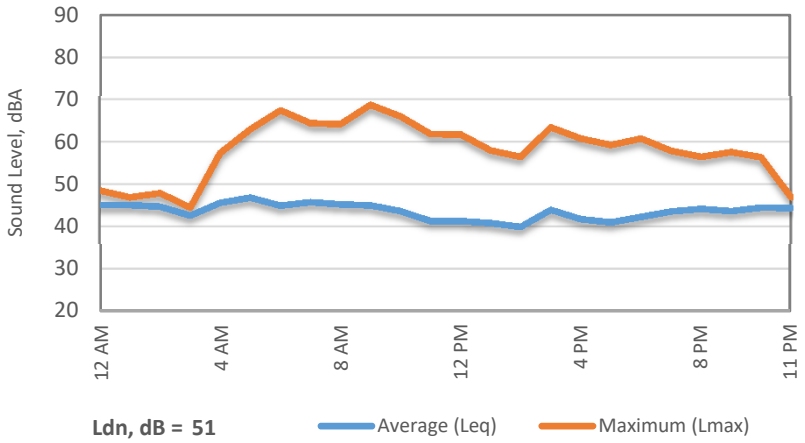
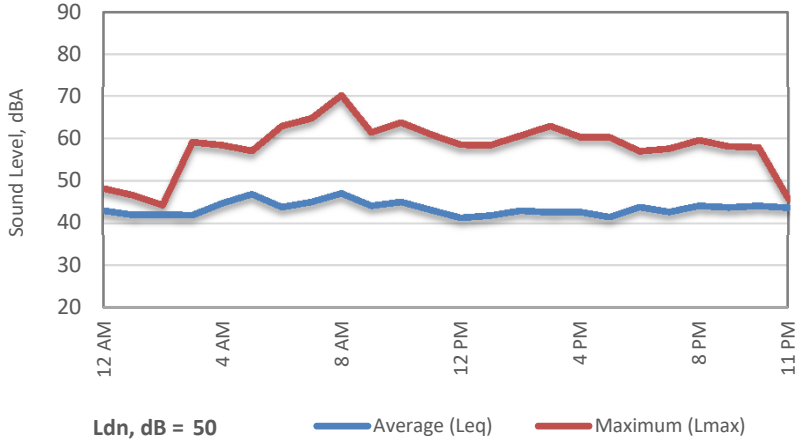
Appendix B-13
Kidder Creek Ambient Noise Monitoring
Friday, June 23, 2017 - Monday, June 26, 2017
Site 4

Friday, June 23, 2017



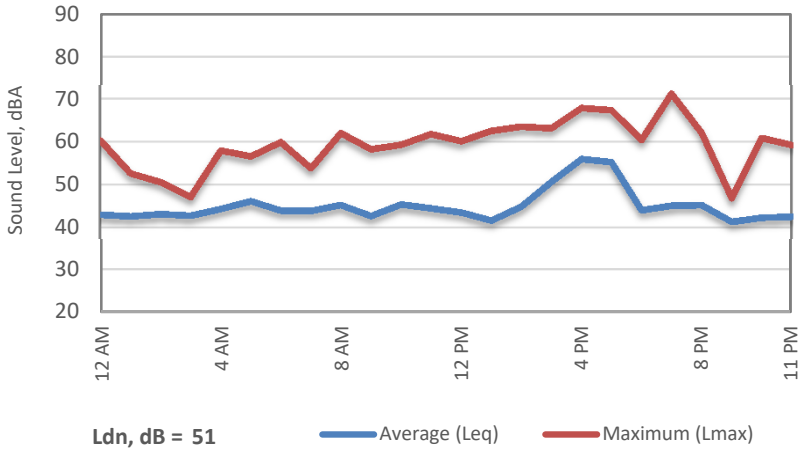
Ldn, dB = 51

Saturday, June 24, 2017



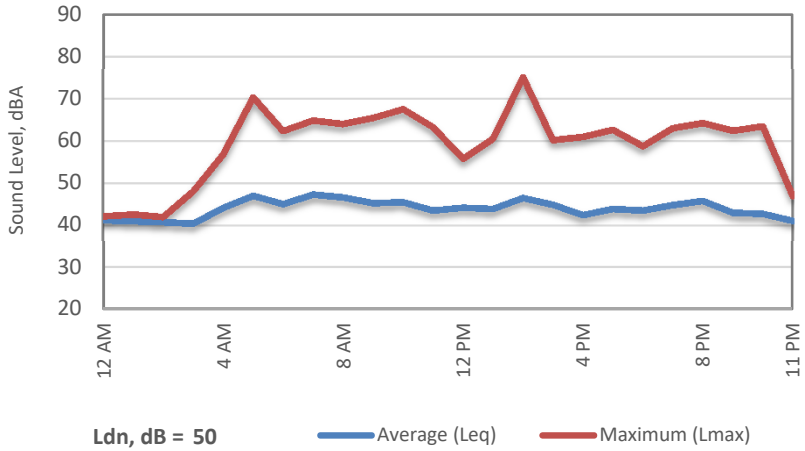
Ldn, dB = 50

Sunday, June 25, 2017



Ldn, dB = 51

Monday, June 26, 2017



Ldn, dB = 50

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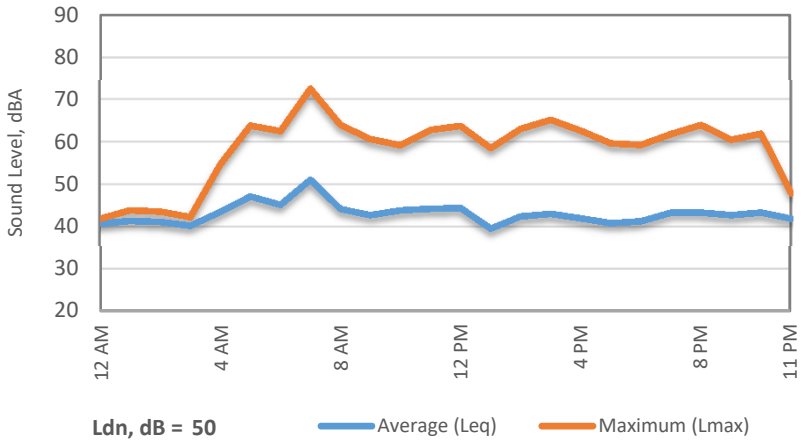
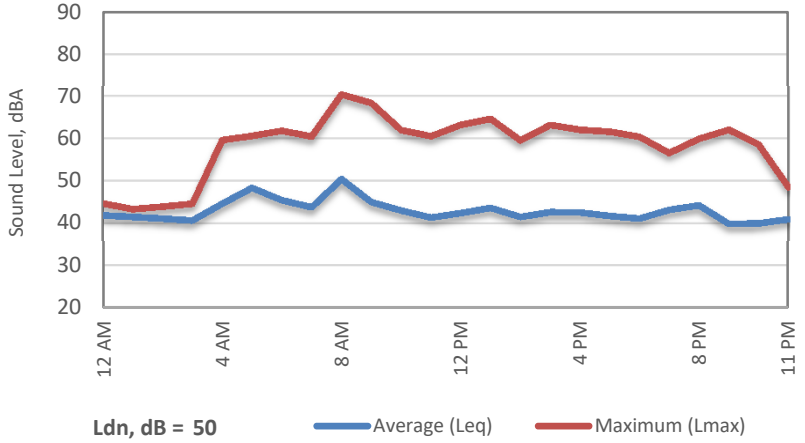
Appendix B-14
Kidder Creek Ambient Noise Monitoring
Tuesday, June 27, 2017 - Friday, June 30, 2017
Site 4

Tuesday, June 27, 2017



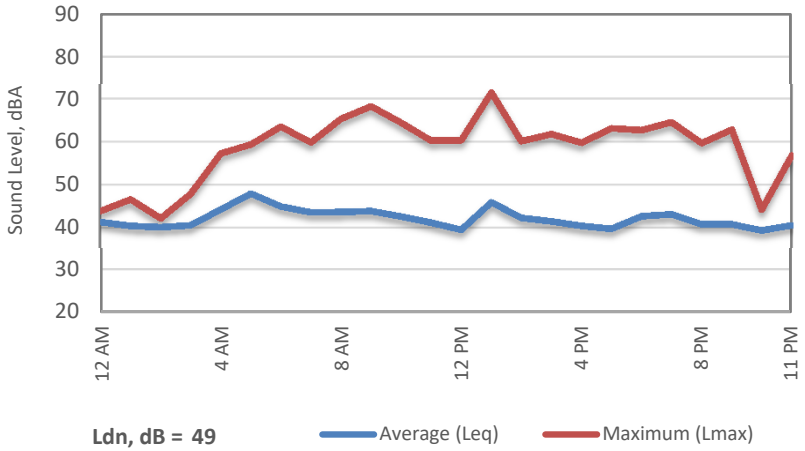
Ldn, dB = 50

Wednesday, June 28, 2017



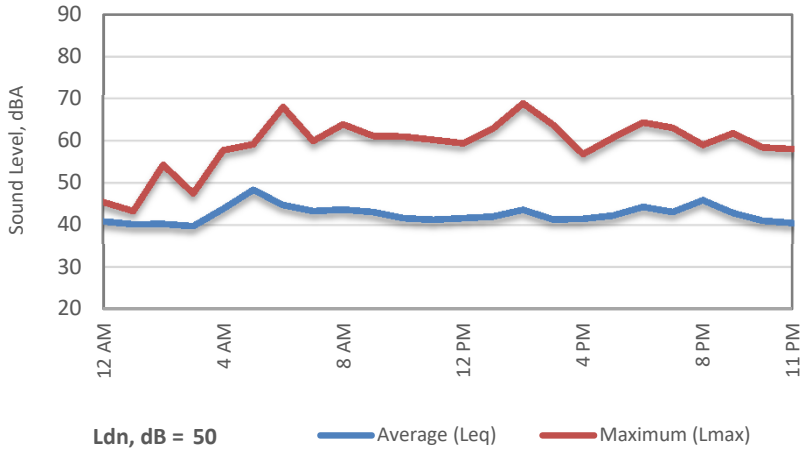
Ldn, dB = 50

Thursday, June 29, 2017



Ldn, dB = 49

Friday, June 30, 2017



Ldn, dB = 50

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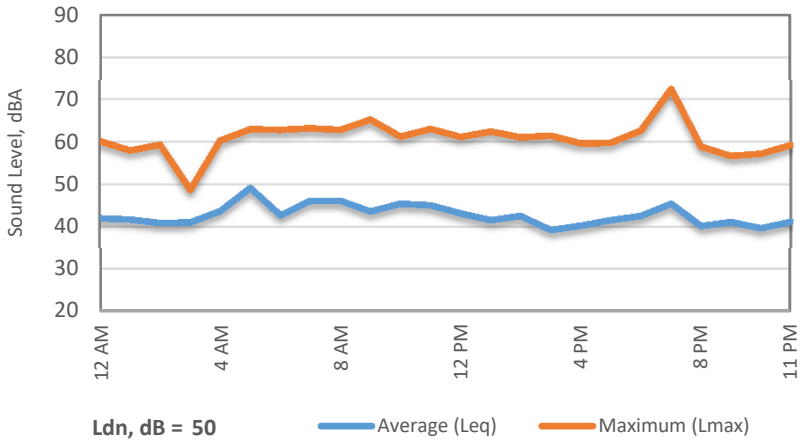
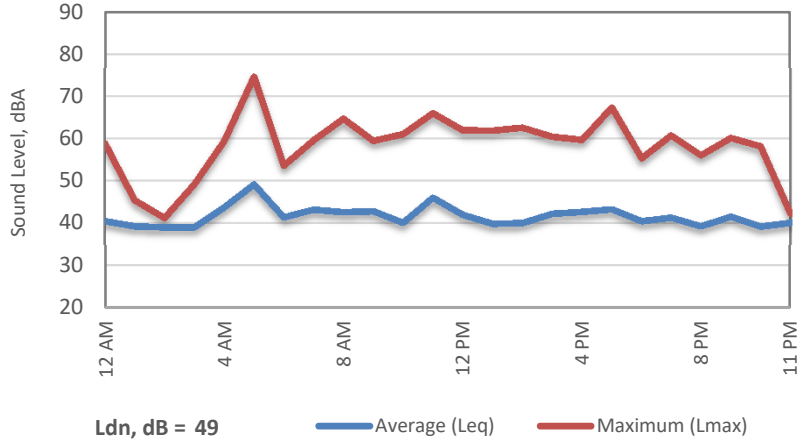
Appendix B-15
Kidder Creek Ambient Noise Monitoring
Saturday, July 1, 2017 - Sunday, July 2, 2017
Site 4

Saturday, July 1, 2017



Ldn, dB = 50

Sunday, July 2, 2017



Ldn, dB = 49

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Appendix C-1

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

Project #: 2017-047 Kidder Creek Orchard Camp Expansion
Description: Existing/Baseline Saturday Traffic Conditions (Weekday volumes would be lower)
Ldn/CNEL: Ldn
Hard/Soft: Soft

Receptor	Roadway Name	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
H	South Kidder Creek Rd.	338	95		5	5	0	30	220	0
I	South Kidder Creek Rd.	338	95		5	5	0	30	270	0
J	South Kidder Creek Rd.	338	95		5	5	0	35	300	0
K	South Kidder Creek Rd.	338	95		5	5	0	40	500	0
L	South Kidder Creek Rd.	338	95		5	5	0	45	380	0
M	South Kidder Creek Rd.	414	95		5	5	0	35	200	0
N	South Kidder Creek Rd.	414	95		5	5	0	35	150	0
O	South Kidder Creek Rd.	414	95		5	5	0	35	70	0
P	South Kidder Creek Rd.	414	95		5	5	0	50	70	0
Q	South Kidder Creek Rd.	414	95		5	5	0	55	300	0

Appendix C-2

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

Project #: 2017-047 Kidder Creek Orchard Camp Expansion
Description: Projected Worst-Case Existing Plus Project Saturday Traffic Conditions (Weekday volumes would
Ldn/CNEL: Ldn
Hard/Soft: Soft

Receptor	Roadway Name	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
H	South Kidder Creek Rd.	1,067	95		5	5	0	30	220	0
I	South Kidder Creek Rd.	1,067	95		5	5	0	30	270	0
J	South Kidder Creek Rd.	1,067	95		5	5	0	35	300	0
K	South Kidder Creek Rd.	1,067	95		5	5	0	40	500	0
L	South Kidder Creek Rd.	1,067	95		5	5	0	45	380	0
M	South Kidder Creek Rd.	1,067	95		5	5	0	35	200	0
N	South Kidder Creek Rd.	1,067	95		5	5	0	35	150	0
O	South Kidder Creek Rd.	1,067	95		5	5	0	35	70	0
P	South Kidder Creek Rd.	1,067	95		5	5	0	50	70	0
Q	South Kidder Creek Rd.	1,067	95		5	5	0	55	300	0

Appendix C-3

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

Project #: 2017-047 Kidder Creek Orchard Camp Expansion
Description: Existing/Baseline Saturday Traffic Conditions (Weekday volumes would
Ldn/CNEL: Ldn
Hard/Soft: Soft

Receptor	Roadway Name	Autos	Medium Trucks	Heavy Trucks	Total
H	South Kidder Creek Rd.	34	32	2	36
I	South Kidder Creek Rd.	33	31	1	35
J	South Kidder Creek Rd.	34	31	-1	36
K	South Kidder Creek Rd.	33	29	-3	34
L	South Kidder Creek Rd.	36	31	-1	37
M	South Kidder Creek Rd.	38	35	3	40
N	South Kidder Creek Rd.	40	37	5	41
O	South Kidder Creek Rd.	45	42	10	46
P	South Kidder Creek Rd.	49	44	11	50
Q	South Kidder Creek Rd.	41	35	2	42

Appendix C-4

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

Project #: 2017-047 Kidder Creek Orchard Camp Expansion
Description: Projected Worst-Case Existing Plus Project Saturday Traffic Conditions
Ldn/CNEL: Ldn
Hard/Soft: Soft

Receptor	Roadway Name	Autos	Medium Trucks	Heavy Trucks	Total
H	South Kidder Creek Rd.	39	37	7	41
I	South Kidder Creek Rd.	38	36	6	40
J	South Kidder Creek Rd.	39	36	4	41
K	South Kidder Creek Rd.	38	34	2	39
L	South Kidder Creek Rd.	41	36	4	42
M	South Kidder Creek Rd.	42	39	7	44
N	South Kidder Creek Rd.	44	41	9	46
O	South Kidder Creek Rd.	49	46	14	50
P	South Kidder Creek Rd.	53	48	15	54
Q	South Kidder Creek Rd.	45	39	6	46

Appendix D-1
Noise Measurement Site Photos

Noise Measurement Site 1

Noise Measurement Site 2

Noise Measurement Site 3

Noise Measurement Site 4

Appendix D-2
General Site Photos

Ropes Course

Adventure Course

Soccer Field

Existing Pond Area

Shooting Range

Appendix D-3
General Site Photos

Camp Area

Kidder Creek

Base Camp Area

Base Camp Area

Screened View of Receptor “E”

Screened View of Receptor “B”