Appendix J
Noise

ESA

Appendix J.1
Environmental Noise Assessment

ESA

SARGENT QUARRY ENVIRONMENTAL NOISE ASSESSMENT

Santa Clara County, California

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INTRODUCTION

The Sargent Quarry Project proposes a sand and gravel mining operation, as well as the construction and operation of aggregate processing facilities, on approximately 300 acres of the 6,400-acre Sargent Ranch property. This report evaluates the project's potential to result in significant noise impacts with respect to applicable California Environmental Quality Act (CEQA) guidelines. The report is divided into two sections: 1) the Setting Section provides a brief description of the fundamentals of environmental noise, summarizes applicable regulatory criteria, and discusses the results of the ambient noise monitoring survey completed to document existing noise conditions at receptors in the project vicinity; and, 2) the Impacts and Mitigation Measures Section describes the significance criteria used to evaluate noise impacts attributable to the project, provides a discussion of each project impact, and presents mitigation measures, where necessary, to provide a compatible project in relation to sensitive land uses in the project vicinity.

SETTING

Fundamentals of Environmental Noise

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its *pitch* or its *loudness*. *Pitch* is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. *Loudness* is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales which are used to describe noise in a particular location. A *decibel (dB)* is a unit of measurement which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Technical terms are defined in Table 1.

There are several methods of characterizing sound. The most common in California is the *A-weighted sound level (dBA).* This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 2. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This *energy-equivalent sound/noise descriptor* is called L_{eq}. The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep -- 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Community Noise Equivalent Level* (*CNEL*) is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 pm - 10:00 pm) and a 10 dB addition to nocturnal (10:00 pm - 7:00 am) noise levels. The *Day/Night Average Sound Level* (*DNL* or L_{dn}) is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

TABLE 1 Definition of Acoustical Terms Used in this Report

Term	Definition
Decibel, dB	A unit describing, the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20 micro Pascals.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e. g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 pm to 10:00 pm and after addition of 10 decibels to sound levels measured in the night between 10:00 pm and 7:00 am.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Handbook of Acoustical Measurements and Noise Control, Harris, 1998.

TABLE 2 Typical Noise Levels in the Environment

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	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 at 3 feet
	80 dBA	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	70 dBA	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
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), California Department of Transportation, September 2013.

Regulatory Background

The State of California and Santa Clara County establish guidelines, regulations, and policies designed to limit noise exposure at noise sensitive land uses. Appendix G of the State CEQA Guidelines, the Santa Clara County Health and Safety Element of the General Plan, and the Santa Clara County Code of Ordinances present the following:

State CEQA Guidelines. The CEQA contains guidelines to evaluate the significance of effects of environmental noise attributable to a proposed project. Under CEQA, noise impacts would be considered significant if the project would result in:

(a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

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

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

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

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

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

Checklist items (a), (c), and (d) are relevant to the proposed project. Blasting is not proposed as part of the project and the project does not propose any equipment operations that would be anticipated to generate excessive groundborne vibration or groundborne noise at the nearest receptors. The project is not located in the vicinity of a public airport or private airstrip and would not expose people working at the site to excessive aircraft noise. Checklist items (b), (e) and (f) are not carried forward for further analysis.

Santa Clara County Health and Safety Element of the General Plan. The County of Santa Clara has adopted a Health and Safety Element as part of the General Plan. The noise limits presented in the Health and Safety Element[1] are applicable to projects that require a conditional use permit, such as the Sargent Quarry. The guidelines state that a new project should not create noise levels that cause the L_{dn} at the nearest noise sensitive receptors to exceed the satisfactory level of 55 dBA.

1 Santa Clara County General Plan - 1995-2010, County of Santa Clara, Planning Office, December 20, 1994.

Santa Clara County Code of Ordinances. Chapter VIII, Control of Noise and Vibration, presents exterior noise limit standards as summarized in Table 4, below:

TABLE 4 Exterior Noise Limit Standards

Receiving Land Use Category[1]	Time Period	Noise Level Standards (dBA)
One and Two Family Residential	10:00 p.m. - 7:00 a.m. 7:00 a.m. - 10:00 p.m.	45 55
Multifamily Dwelling Residential Public Space	10:00 p.m. - 7:00 a.m. 7:00 a.m. - 10:00 p.m.	50 55
Commercial	10:00 p.m. - 7:00 a.m. 7:00 a.m. - 10:00 p.m.	60 65
Light Industrial	Any time	70
Heavy Industrial	Any time	75
Adjustments to Noise Level Standard		
Duration		
L50	30 minutes per hour	Standard
L25	15 minutes per hour	Standard + 5 dB
L8	5 minutes per hour	Standard + 10 dB
L2	1 minute per hour	Standard + 15 dB
L0	Maximum permissible level	Standard + 20 dB
Character	Tone, whine, screech, hum, or music or speech	Standard - 5 dB
Ambient Level[2]	Existing ambient L50, L25, L8, L2 Existing ambient L0	Standard + 5 dB Existing maximum

Footnotes

(1) If the noise measurement occurs on a property adjoining a different land use category, the noise level limit applicable to the lower land use category, plus five dB, will apply.

(2) If for any reason the alleged offending noise source cannot be shutdown, the ambient noise must be estimated by performing a measurement in the same general area of the source but at a sufficient distance that the noise from the source is at least ten dB below the ambient in order that only the ambient level be measured. If the difference between the ambient and the noise source is five to ten dB, then the level of the ambient itself can be reasonably determined by subtracting a one-decibel correction to account for the contribution of the source.

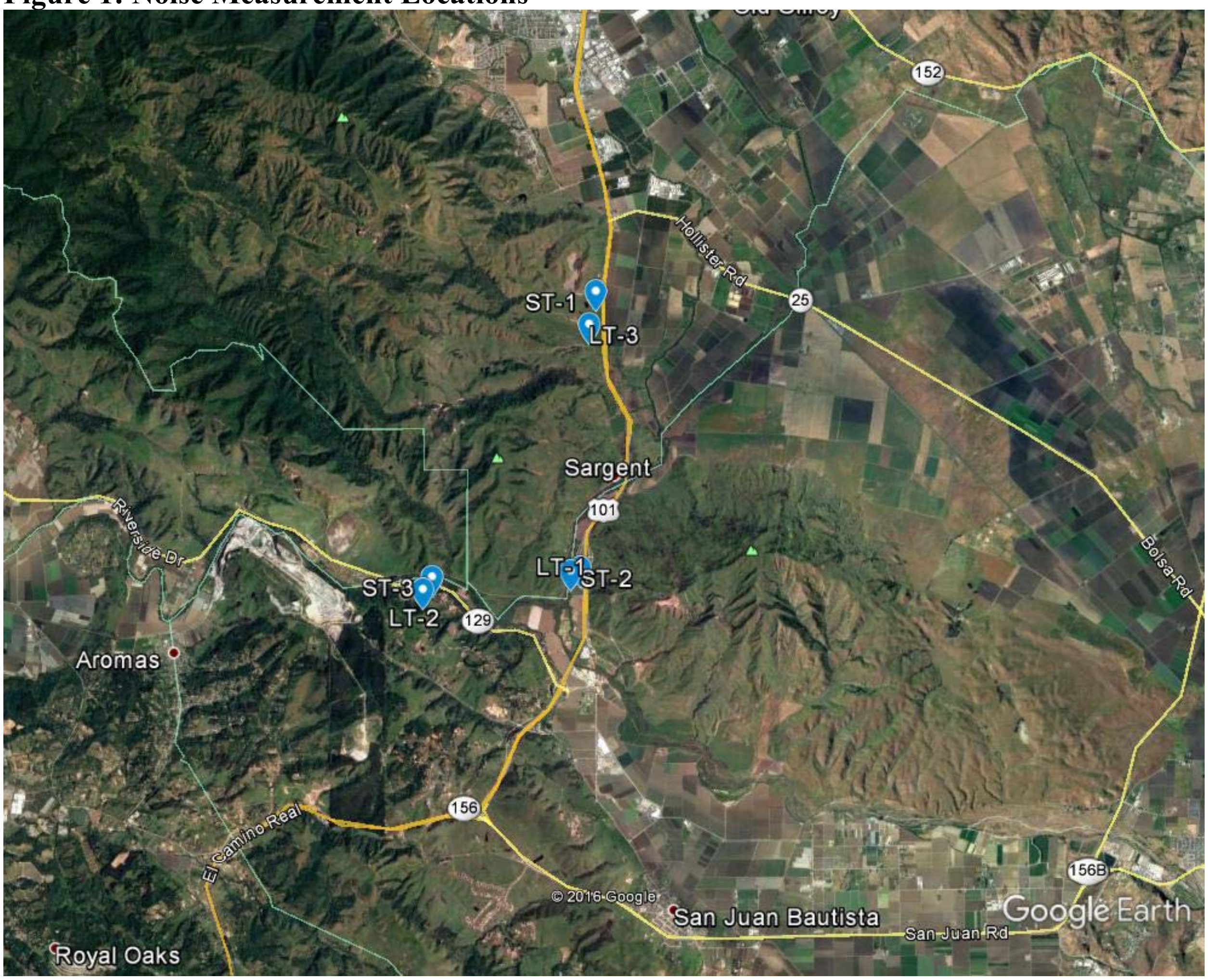
The noise ordinance infers that the noise levels are not to be exceeded anywhere on the affected properties. However, given the rugged terrain adjacent to the quarry, it is logical to apply the standard at the outdoor use areas established around the affected residences as opposed to the property lines, which tend to be on steep hillsides.

Existing Noise Environment

The project site is located in Santa Clara County, south of the City of Gilroy. The proposed sand and gravel mining operation would occupy approximately 300 acres of the existing 6,400-acre Sargent Ranch property. The density of residences in the area surrounding the quarry is low and includes a small subdivision to the south along State Route 129 (SR 129), the Betabel RV Resort to the east, and rural residences to the north and northeast. Suburban homes and a school are located about 3 miles north of the site in the City of Gilroy.

A noise monitoring survey was conducted by Illingworth & Rodkin, Inc. in November 2016 to quantify ambient noise levels at receptors near the quarry. A combination of three unattended long-term noise measurements and three attended short-term noise measurements were made to document existing noise levels representative of the nearest residential and other noise sensitive receptors. Noise levels at the long-term locations were measured from the afternoon of Wednesday, November 16, 2016 to the afternoon of Friday, November 18, 2016. Short-term measurements were made on Friday, November 18, 2016. Long and short-term measurement locations are indicated below in Figure 1.

Figure 1: Noise Measurement Locations



Source: Google Earth

The first long-term noise measurement was made west of Betabel RV Park, about 830 feet from the edge of US Highway 101 (US 101). Noise measurement location LT-1 was selected to document the diurnal noise levels generated by traffic along US 101 and to represent existing noise conditions at the Betabel RV Park. The primary noise source at this location was traffic along US 101, and local natural and residential noises. The day-night average noise level at this location was 59 dBA L_{dn}, with daytime weekday hourly average noise levels in the range of 48 to 56 dBA L_{eq}. Data collected at Site LT-1 are depicted in Appendix A.

The second long-term noise measurement was made near residences in the vicinity of School Road and Payne Road, about 615 feet south of SR 129. Noise measurement location LT-2 was selected to represent ambient noise levels at residential properties in this area and along SR 129. The ambient noise environment at LT-2 was traffic along SR 129. During the two site visits, heavy truck traffic along SR 129 was noted as the predominant source of noise. Daytime weekday hourly average noise levels typically ranged from 51 to 63 dBA L_{eq} at this location. However, intermittent noisy events taking place between about 2:40 and 4:30 pm on Thursday, November 17th, 2016, resulted in elevated hourly average noise levels of 70 and 72 dBA L_{eq}. The day-night average noise level at this location was 62 dBA L_{dn}, including the elevated levels between 2:40 and 4:30 pm on November 16th. For 24-hour periods which did not include these elevated levels, the L_{dn} was 57 dBA. Data collected at Site LT-2 are depicted in Appendix A.

Long-term noise measurement LT-3 was made along Old Monterey Road, about 825 feet west of US 101. Noise measurement location LT-3 was selected to measure the diurnal noise levels generated by traffic along US 101 and Old Monterey Road. The primary noise source at this location was traffic along US 101, given the infrequency of traffic along Old Monterey Road. The day-night average noise level at this location was 66 dBA L_{dn}, with daytime weekday hourly average noise levels in the range of 54 to 63 dBA L_{eq}. Data collected at Site LT-3 are depicted in Appendix A.

Three short-term noise measurements were made in areas surrounding the quarry site. A summary of the results of the short-term measurements is shown in Table 5.

TABLE 5 Short-Term Noise Measurement Results, Friday, November 20th, 2016

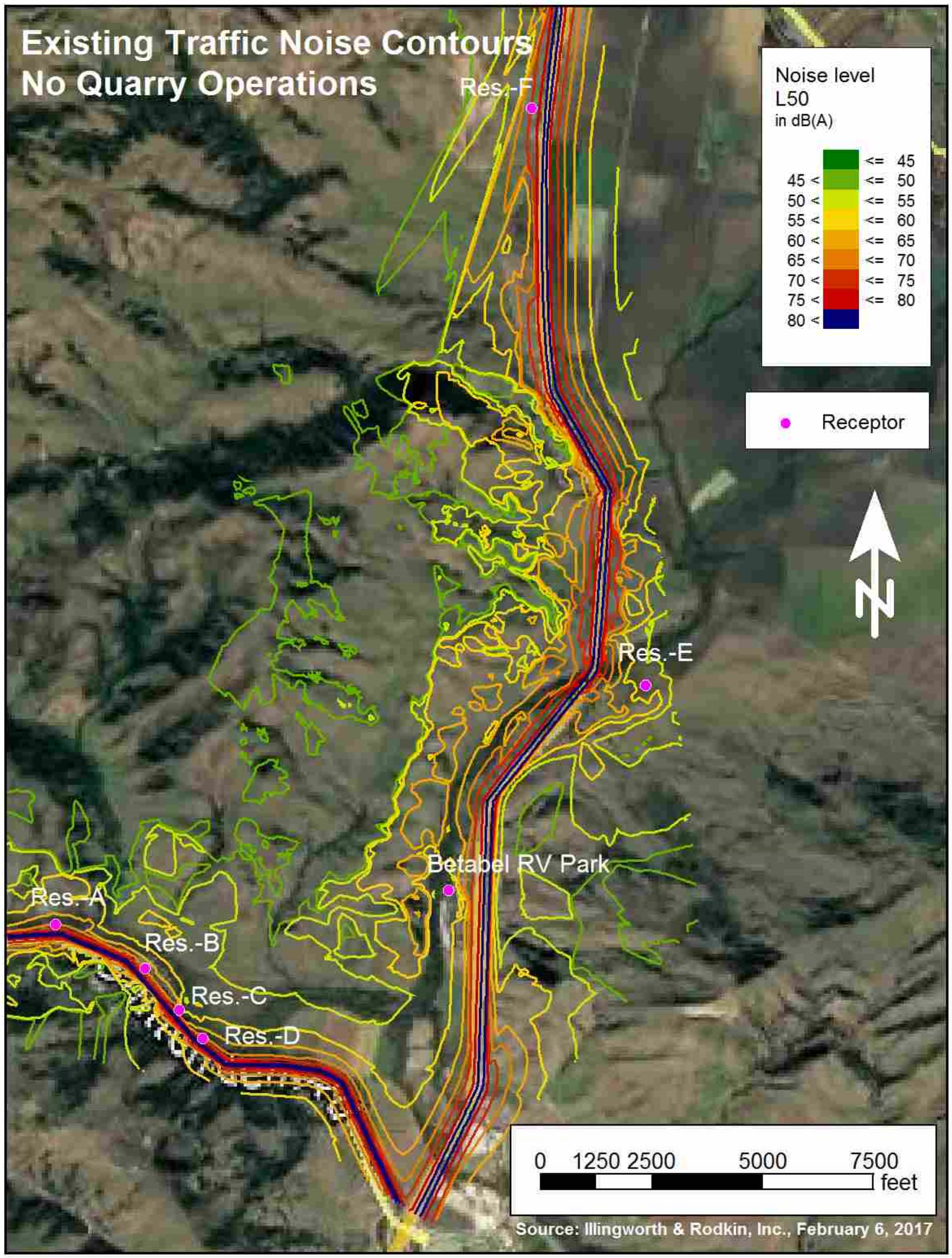
Location	L_1	L_{10}	L_{50}	L_{90}	L_{max}	L_{eq}	Primary Noise Sources (L_{max})
ST-1: Entrance to Quarry, ~55 ft from center of Old Monterey Road, 9:10 to 9:20 am (see LT-3)	66	64	62	59	67	62	Traffic on US 101 and local traffic (Old Monterey Road)
ST-2: Northeast corner of Betabel RV Park, 9:40 to 10:00 am (see LT-2)	59	55	51	48	62	52	Traffic on US 101 and ramps, distant heavy equipment
	59	54	51	49	59	52	
ST-3: Setback of homes along SR 129, 10:20 to 10:30 am (see LT-1)	76	72	62	42	78	68	Traffic on SR 129

As described above, the primary noise source at receptors in the vicinity of the project site is traffic noise generated by vehicles traveling along US 101 and SR 129. SoundPLAN Version V7.4 was used to calculate existing traffic noise contours for these roadways, based on traffic volumes available from Caltrans[2]. SoundPLAN is a three-dimensional ray-tracing program,

[2] Available at http://www.dot.ca.gov/trafficops/census/

which takes into account the topography of the area. The model was calibrated to existing L_{50} conditions, using the results of the existing noise measurement data presented above. Figure 2 shows the calculated existing peak hour traffic noise contours for the project site and at noise sensitive receptors in the vicinity of the site.

FIGURE 2 Existing Traffic Noise Contours



NOISE IMPACTS AND MITIGATION MEASURES

Significance Criteria

Paraphrasing from Appendix G of the CEQA Guidelines, the project would normally result in significant noise impacts if noise levels generated by the project conflict with adopted environmental standards or plans, or if noise levels generated by the project would substantially increase existing noise levels on a permanent or temporary basis. The following criteria were used to evaluate the significance of environmental noise resulting from the project:

- **Noise in Excess of Standards (Operations):** A significant noise impact would result if exterior noise levels generated by the project would exceed Santa Clara County Code of Ordinance noise limits.

  The following noise limits from the Code of Ordinance are used as significance criteria for project operations.

Receptor	A-Weighted Noise Level (dBA)									
	Daytime					Nighttime				
	L_{50}	L_{25}	L_8	L_2	L_{max}	L_{50}	L_{25}	L_8	L_2	L_{max}
One and Two Family Residential	55	60	65	70	75	45	50	55	60	65
Multi-Family Residential	60	65	70	75	80	50	55	60	65	70
Commercial	65	70	75	80	85	60	65	70	75	80

- **Permanent Increase in Noise (Project Traffic):** Santa Clara County does not establish thresholds for assessing project impacts due to increased traffic noise. Based on thresholds commonly used throughout the Bay Area, a substantial permanent noise increase would occur if the project would increase existing noise levels at sensitive land uses by 3 dBA or greater in areas where existing with project noise levels exceed those considered normally acceptable for the land use (60 dBA L_{dn} for residential uses) or 5 dBA L_{dn} or greater in areas where existing with project noise levels would remain below those considered normally acceptable for the land use.

Impact 1: Noise from operation of the proposed project would be below the Santa Clara County noise level limits and would not cause a substantial permanent increase in noise at any noise sensitive receptor locations in the vicinity of the project. *This is a less-than-significant impact.*

The Sargent Quarry Project proposes a sand and gravel mining operation, as well as the construction and operation of aggregate processing facilities, on approximately 300 acres of the 6,400-acre Sargent Ranch property. It is estimated that approximately 38,665,000 cubic yards of material, including about 28 million cubic yards (40 million tons) of sand and gravel aggregate would be mined over the 30-year permit term of the quarry.

As part of the project, an approximately 14-acre processing plant would be developed in the northeastern portion of the site, adjacent to US 101. On-site construction for the processing plant would include grading and site clearing, roads, a bridge over Tar Creek, and a materials conveyor system. The processing area would include an office, shop, maintenance buildings, equipment storage yard, parking area, truck scales, and loading area. During mining operations, excavated sand and gravel would be hauled via the conveyor belt (for Phases 1 and 2) or trucks (for Phases 3 and 4) to the processing plant. Excavated material would be mechanically sized, washed, sorted into stockpiles, and prepared for shipping at the processing plant. Some materials would also be crushed and sorted into stockpiles via radial stacker and conveyers. A five-foot-tall berm would be constructed around the northern boundary of the processing plant site to provide flood protection. A total of 30 pieces of equipment are anticipated to operate at the processing site, including hoppers, crushers, screens, conveyers, and stackers.

Mining would occur in four phases. Sand and gravel deposits would be mined using an open-pit mining method. Blasting is not proposed as part of the project to fracture or loosen sand or gravel deposits. Once mining is complete, earthmoving would be undertaken as part of the reclamation of each mined area. The four mining phases would occur successively, with operations moving to the next phase once the prior phase is complete. Mining in the Phase 1 and Phase 2 areas is anticipated to occur for 10 to 15 years with roughly 8,565,000 cubic yards of material being excavated. Mining in the Phase 3 and Phase 4 areas is anticipated to occur for 10 to 15 years (approximately years 15 to 30) with roughly 30,100,000 cubic yards of material excavated. Phase 4 will be the largest phase of the project with a total excavation of approximately 16,800,000 cubic yards.

The following equipment is anticipated at each of the mining sites during operation of the project:

- CAT Dozer (1)
- CAT Excavator (1)
- CAT Haul Truck (2)
- CAT Wheel Loader (1)
- CAT Motor Grader (1)

Mining operations are proposed to occur year round. Mining and processing plant operations, including truck loadout, would typically occur at the site Monday through Saturday between 7:00 a.m. and 4:30 p.m. Maintenance of mobile equipment and deliveries (e.g., fuels) would occur during normal operating hours. The level of activity at the quarry would be highest during the construction season between April and October, and lowest during the rainy season.

Occasional Sunday and holiday work would occur as part of special projects. Per County Code Regulations (Chapter 4.10), no commercial excavation shall be operated on Sundays or the following holidays: New Year’s Day, Independence Day, Labor Day, Thanksgiving, and Christmas Day) unless authorized by the Planning Commission or Planning Director. Extended processing plant hours are proposed to be permitted to allow mining operations to occur at night, providing the operator flexibility to respond to market conditions, nighttime public works projects, and emergency or special circumstances. However, nighttime operations will be very occasional and would include operations at the processing plant only; no nighttime mining is proposed.

SoundPLAN Version V7.4 was used to calculate noise levels assuming the operation of the proposed project. Because mining equipment typically generates steady noise levels while in operation, the most restrictive noise limit for the purposes of this assessment is the L_{50} (the noise level exceeded 30 minutes in any hour). For steady noise, the L_{50} noise limit is the lowest noise limit and would be exceed before any of the other noise limits contained in the code (L_{25}, L_{08}, or L_{02} limits).

Figure 3 shows a credible worst-case scenario for the operation of the processing plant, with all proposed processing equipment operating simultaneously, for a total of 30 individual pieces of equipment. Through comparison of Figure 2 and Figure 4, which includes both processing plant and existing traffic noise sources, the noise environment at noise sensitive receptors in the vicinity of the project would not be substantially increased with the project and would continue to result primarily from traffic along US 101 and SR 129, even with full operation of the processing plant.

Figures 5 through 8 shows the L_{50} noise contours generated during credible worst-case scenarios of mining operations during each of the four mining phases. To simulate worst-case scenarios, equipment was placed on the top of the existing grade. As each area is mined, additional shielding would be provided by the surrounding terrain, resulting in even lower noise levels than those indicated in the figures showing worst-case operational noise levels.

FIGURE 3 Future Noise Contours for Full Processing Operations

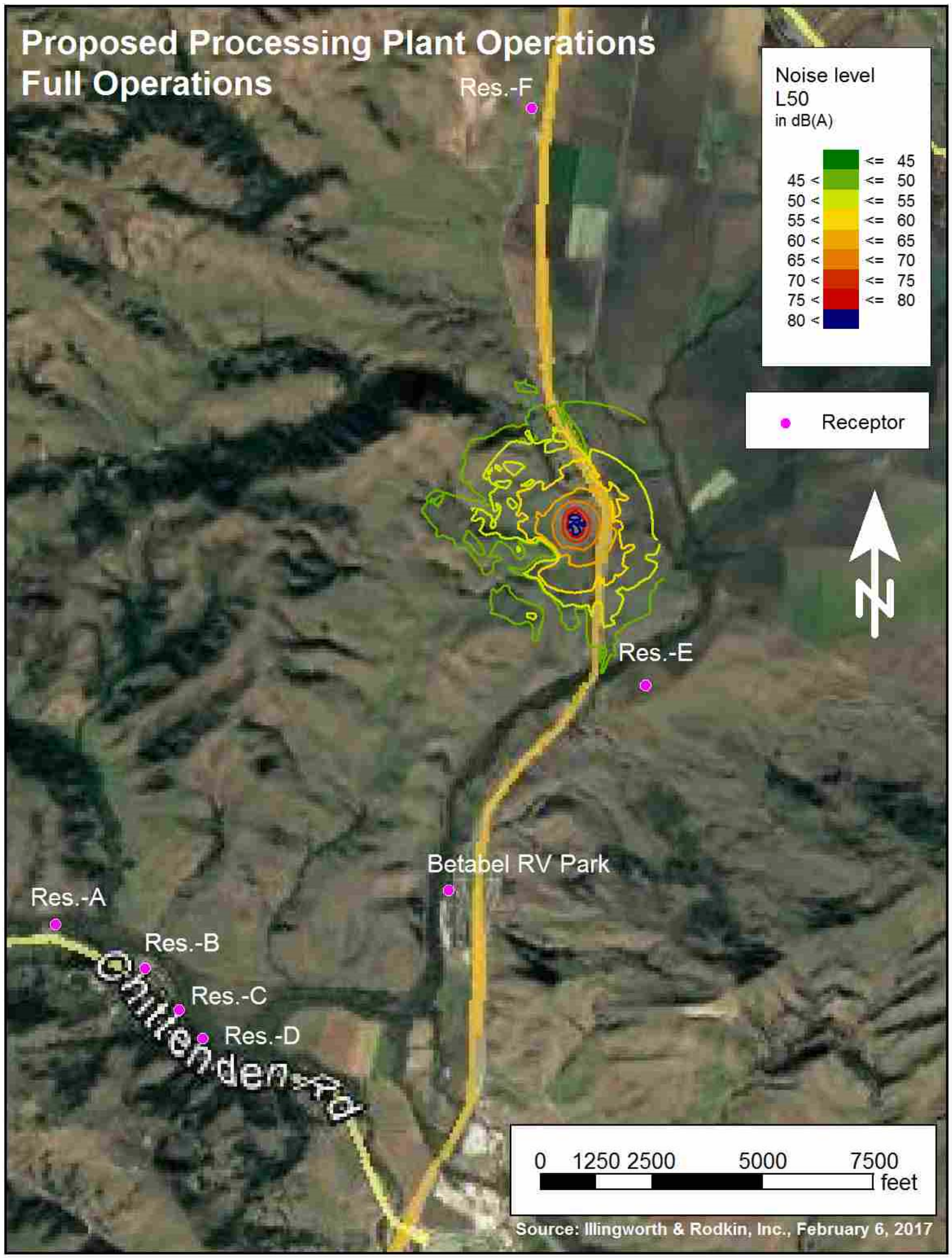


FIGURE 4 Noise Contours for Processing Operations and Existing Traffic Conditions

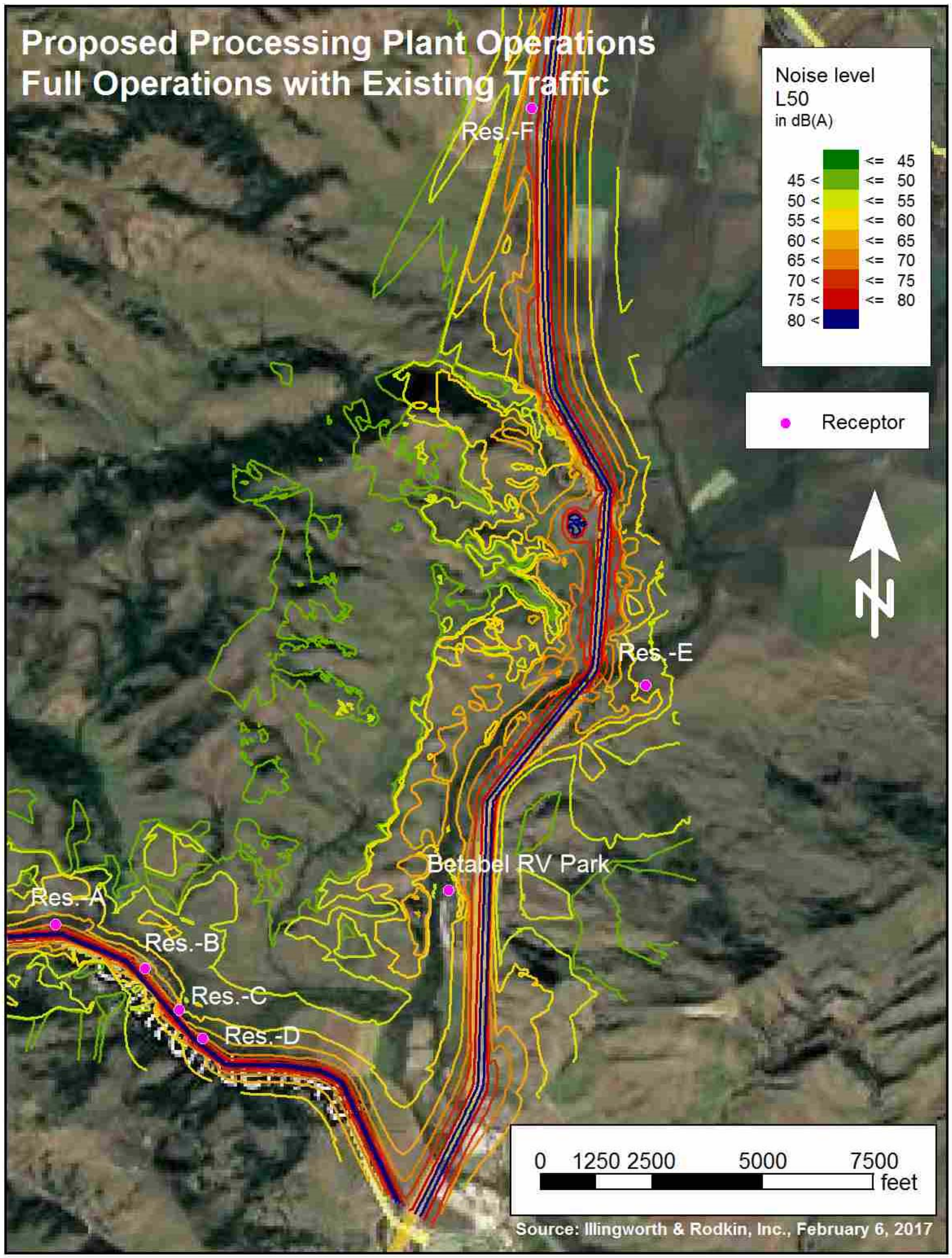


FIGURE 5 Future Noise Contours for Phase 1 Operations

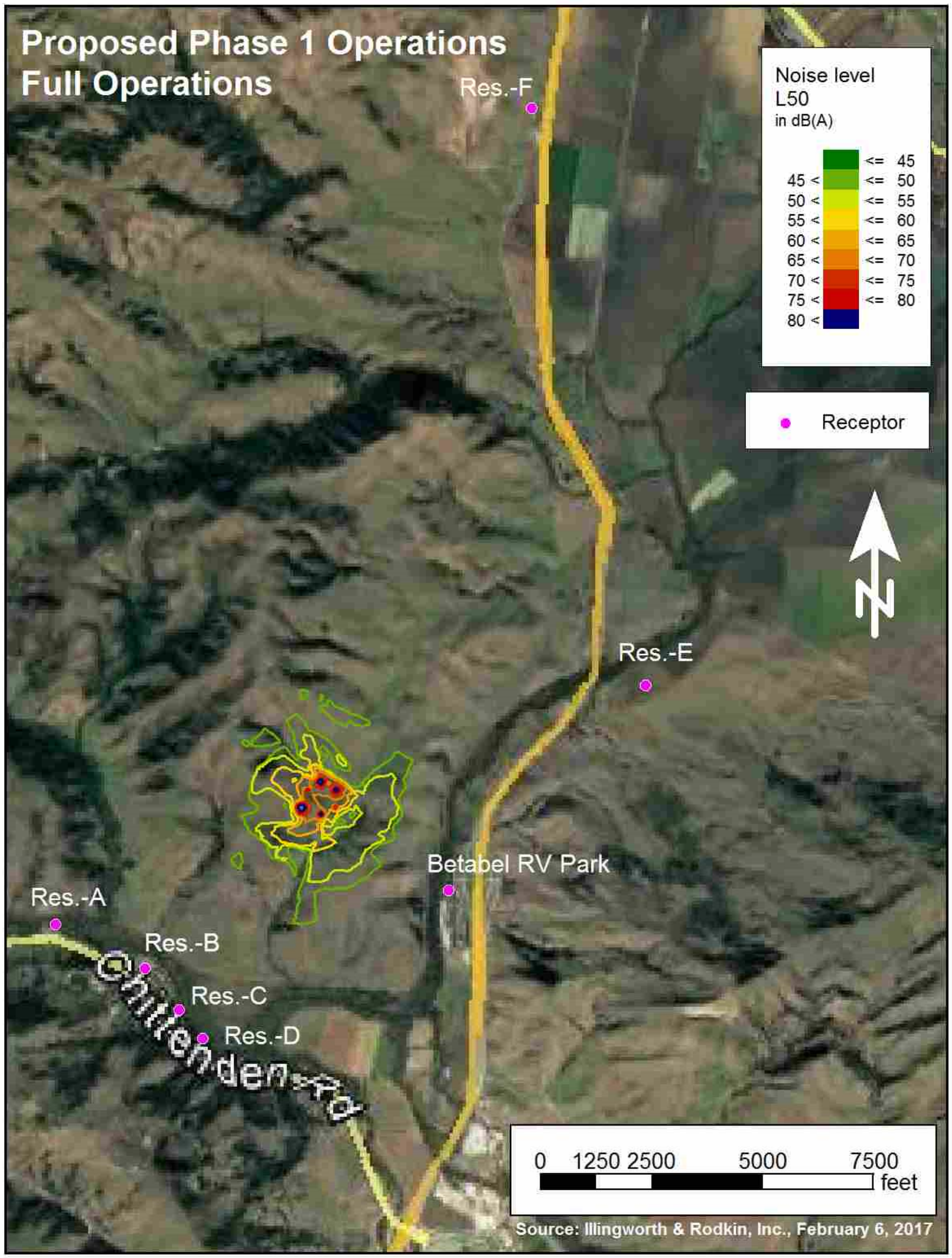


FIGURE 6 Future Noise Contours for Phase 2 Operations

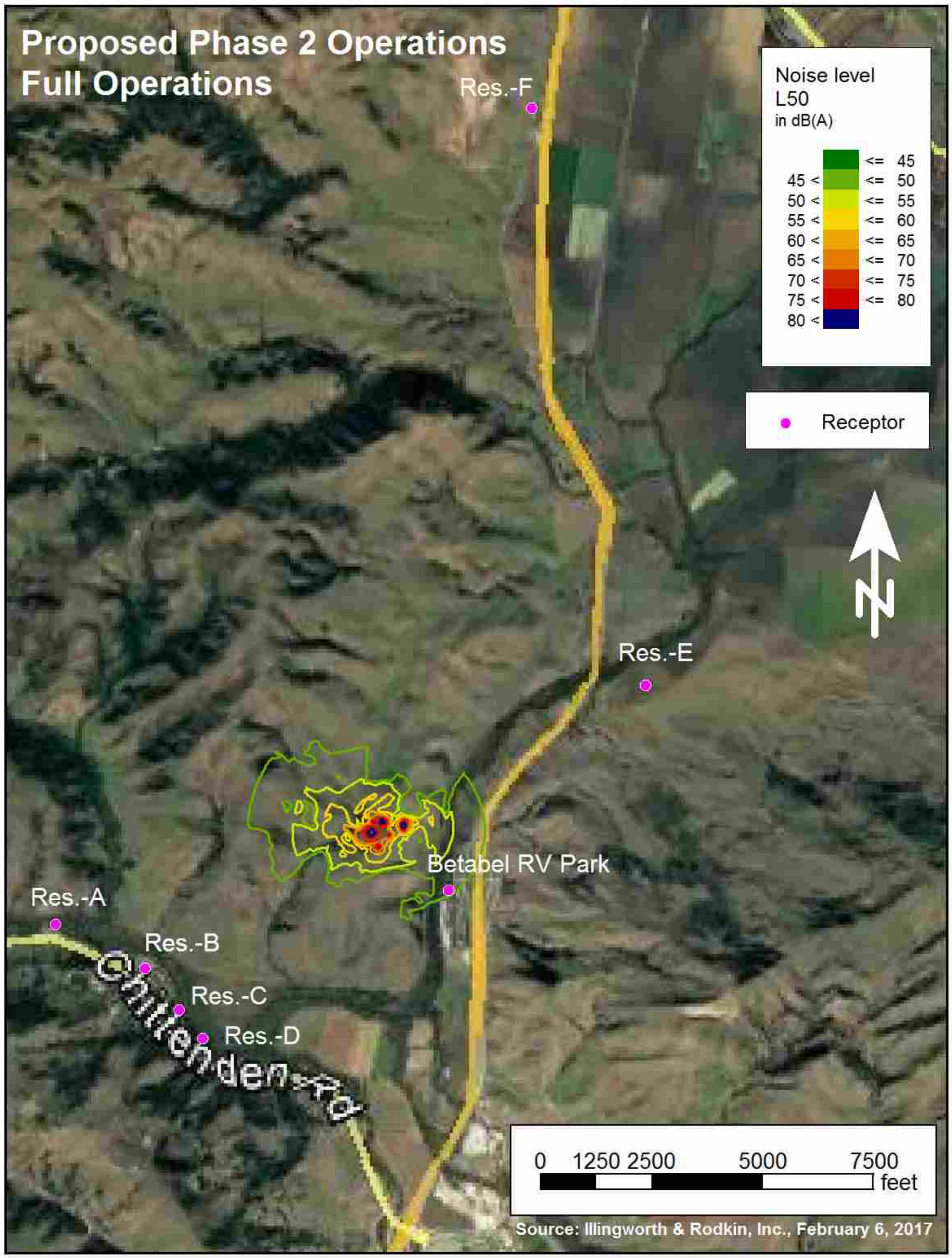


FIGURE 7 Future Noise Contours for Phase 3 Operations

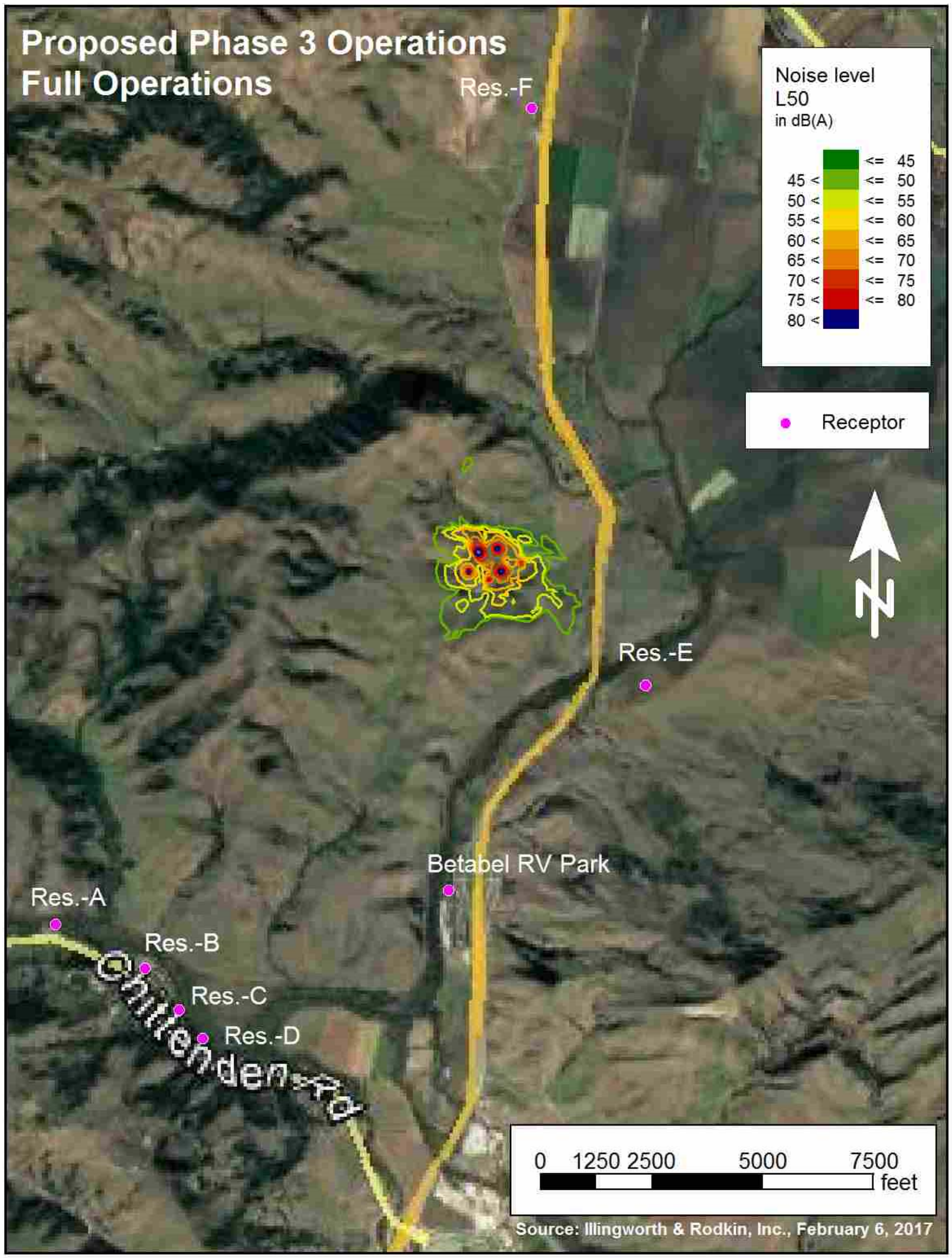
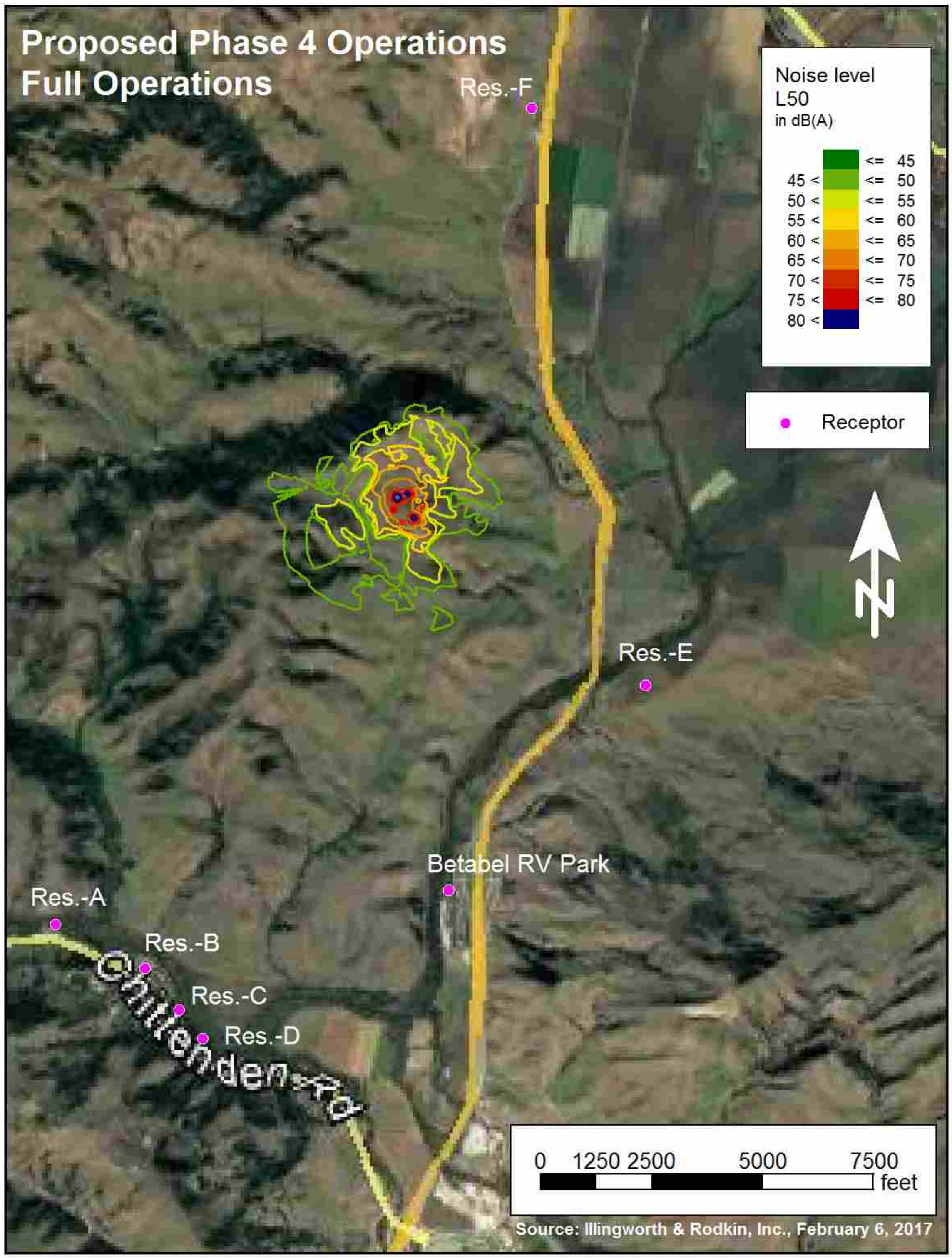


FIGURE 8 Future Noise Contours for Phase 4 Operations



The calculated L_{50} noise levels generated under credible worst-case conditions by each phase of operations at each of the nearest noise sensitive receptors are shown in Table 6, along with the ambient traffic noise levels, which were calculated based on the results of the noise measurements described in the Setting Section. Noise level increases above existing ambient levels are shown in Table 7. Project generated L_{dn} levels, assuming full operations for the entire daytime period between 7:00 am and 5:00 pm, would be 4 dBA lower than the levels indicated in Table 6, resulting in lower L_{dn} noise increases than the levels shown in Table 7.

TABLE 6: Calculated Ambient and Worst-Case Project Noise Levels at Nearest Noise Sensitive Receptors

Receptor	Ambient Traffic Noise Levels, dBA	Worst-Case Project Operational Noise Levels, L_{50} dBA				
		Processing Plant	Phase 1	Phase 2	Phase 3	Phase 4
Betabel RV Resort	52	30	31	46	26	28
Residence A	65	23	30	33	17	22
Residence B	55	25	34	32	19	22
Residence C	66	17	24	30	13	11
Residence D	53	41	30	30	37	31
Residence E	68	25	33	30	21	22
Residence F	71	31	10	15	24	26

TABLE 7: Operational Noise Levels and Increases over Ambient Conditions

Receptor	Ambient, dBA	Ambient + Operational Noise Levels, L_{50} dBA				
		Processing Plant	Phase 1	Phase 2	Phase 3	Phase 4
Betabel RV Resort	52	52	52	53	52	52
Residence A	65	65	65	65	65	65
Residence B	55	55	55	55	55	55
Residence C	66	66	66	66	66	66
Residence D	53	54	53	53	53	53
Residence E	68	68	68	68	68	68
Residence F	71	71	71	71	71	71
Receptor		**Project Increase Over Ambient, dBA**				
		Processing Plant	**Phase 1**	**Phase 2**	**Phase 3**	**Phase 4**
Betabel RV Resort		0	0	1	0	0
Residence A		0	0	0	0	0
Residence B		0	0	0	0	0
Residence C		0	0	0	0	0
Residence D		0	0	0	0	0
Residence E		0	0	0	0	0
Residence F		0	0	0	0	0

As indicated in Figure 3, Figures 5 through 8 and Table 6, L_{50} noise levels would 46 dBA or less at noise sensitive receptors in the vicinity of the project during worst-case project operations, with most operations generating noise levels below 30 dBA at these receptors. Project operations would be well below ambient noise levels and below the most conservative daytime 50 dBA L_{50} criterion for one and two family residences. Worst-case processing plant operations would generate noise levels of 41 dBA or less at noise sensitive receptors, below the most conservative nighttime criteria of 45 dBA L_{50}. Additionally, L_{50} levels resulting from the proposed project would be 7 to 60 dBA lower than ambient levels at the nearest noise sensitive receptors under worst-case processing and mining operations. As indicated in Table 7, project operations would not result in substantial increases in the noise environment above existing noise levels (increases would be 1 dBA or less). L_{max} levels of quarry equipment, which are typically about 10 dBA higher than L_{50} levels, would also be well below the Santa Clara County thresholds of 75 dBA L_{max} during the daytime and 65 dBA L_{max} at night.

Quarry noise levels are calculated to be below the Santa Clara County noise limits and would not typically be measureable above existing ambient noise levels. Quarry noise is not anticipated to be audible at noise sensitive areas in the vicinity of the site due to the proximity of these receptors to major sources of noise including US 101 and SR 129. This is a less-than-significant impact.

Mitigation: None required.

Impact 2: Project-generated traffic noise would not substantially increase ambient traffic noise levels along roadways serving the project site. This is a less-than-significant impact.

Access to the project site would occur via southbound US 101 and Old Monterey Road through a gated entrance on to an existing private access road. Both Old Monterey Road and the private access road would be repaved to accommodate the two-way truck traffic associated with the project. Trucks traveling to destinations north of the quarry would use the Sargent Ranch undercrossing of US 101. The existing Sargent Ranch undercrossing of US 101 would be widened and paved under the proposed project. A new 13-foot-wide, approximately 0.25-mile-long acceleration lane for trucks accessing northbound US 101 would installed as part of the project on the east side of the Sargent Ranch on-ramp to US 101. Trucks leaving the site traveling to destinations south of the quarry would exit onto Old Monterey Road and then onto southbound US 101 via an existing stacking lane. In addition, the project proposes construction of access and maintenance roads extending from the quarry entrance across Tar Creek to the processing plant and to all four mining areas. A bridge is proposed over Tar Creek to provide truck access to the processing area, truck scales and office. There is only one noise sensitive residence (Residence F) located along these routes.

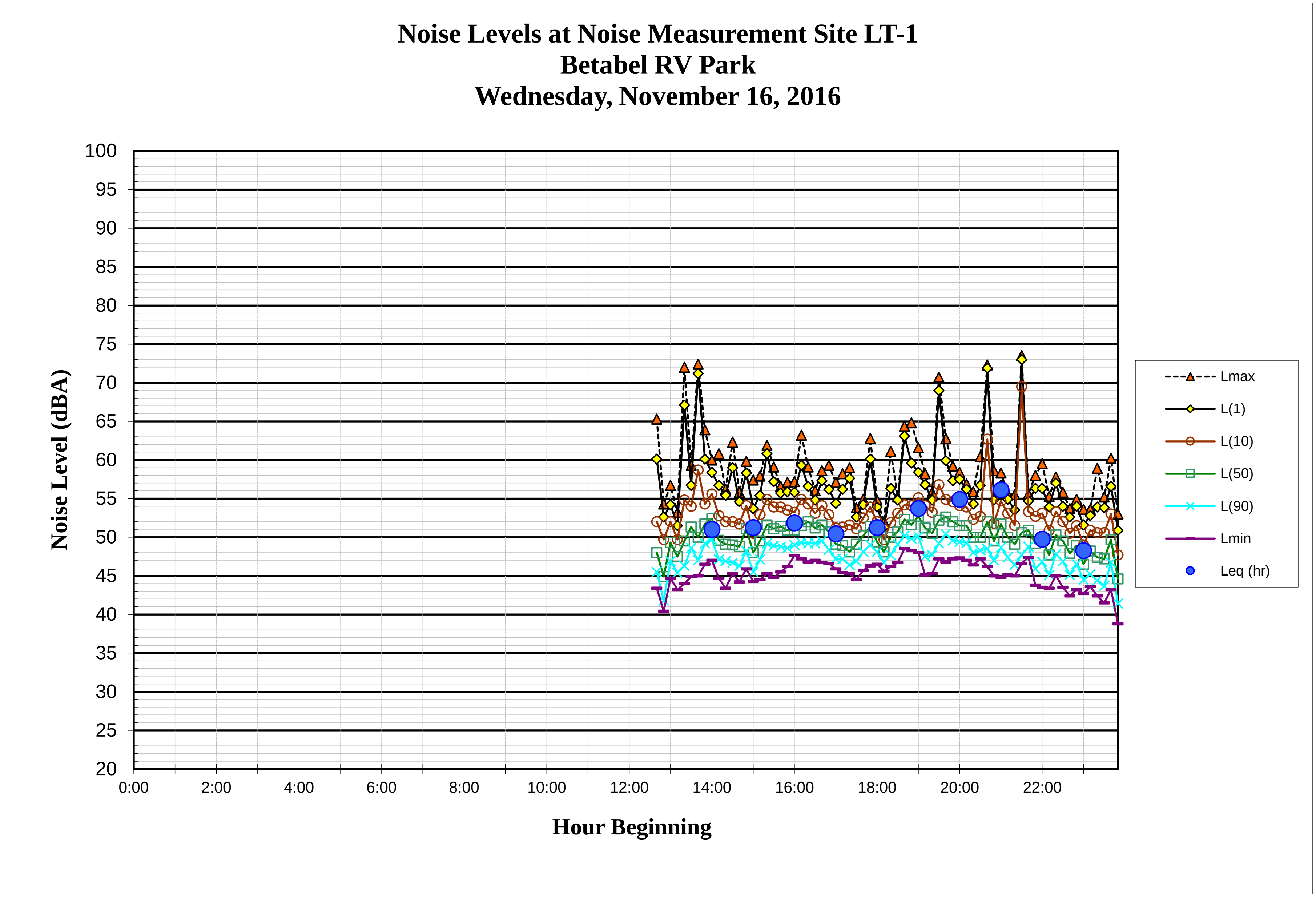
Project generated traffic noise increases would be considered significant if project traffic were to cause an increase in the noise environment at noise sensitive receptors of 3 dBA or greater in areas where existing with project noise levels exceed those considered normally acceptable for the land use (60 dBA L_{dn} for residential uses) or 5 dBA or greater in areas where existing with project noise levels would remain below those considered normally acceptable for the land use.

The traffic noise impact evaluation is based on traffic volumes provided by Hexagon Transportation Consultants, dated December 14th, 2016 and January 26th, 2017. The project is anticipated to have 18 loads per hour between 7:00 am and 4:00 pm. In addition, the project anticipates up to 2 truck material deliveries and 2 maintenance vehicles occurring during some hours. This results in a total of 40 additional truck trips per hour during peak operations. Additionally, the project is anticipated to add 10 morning peak hour and 3 evening peak hour trips to the SR 25 interchange without the construction of the US 101 Widening between Monterey Road and SR 129 and to add 28 morning peak hour and 8 evening peak hour trips to the SR 25 interchange with the construction of the US 101 Widening. Based on traffic volumes provided by Caltrans[3], US 101 currently has about 5,300 vehicle trips per peak hour, with about 7.5 % trucks, and SR 25 carries about 2,200 vehicles per peak hour, with about 6.5% trucks.

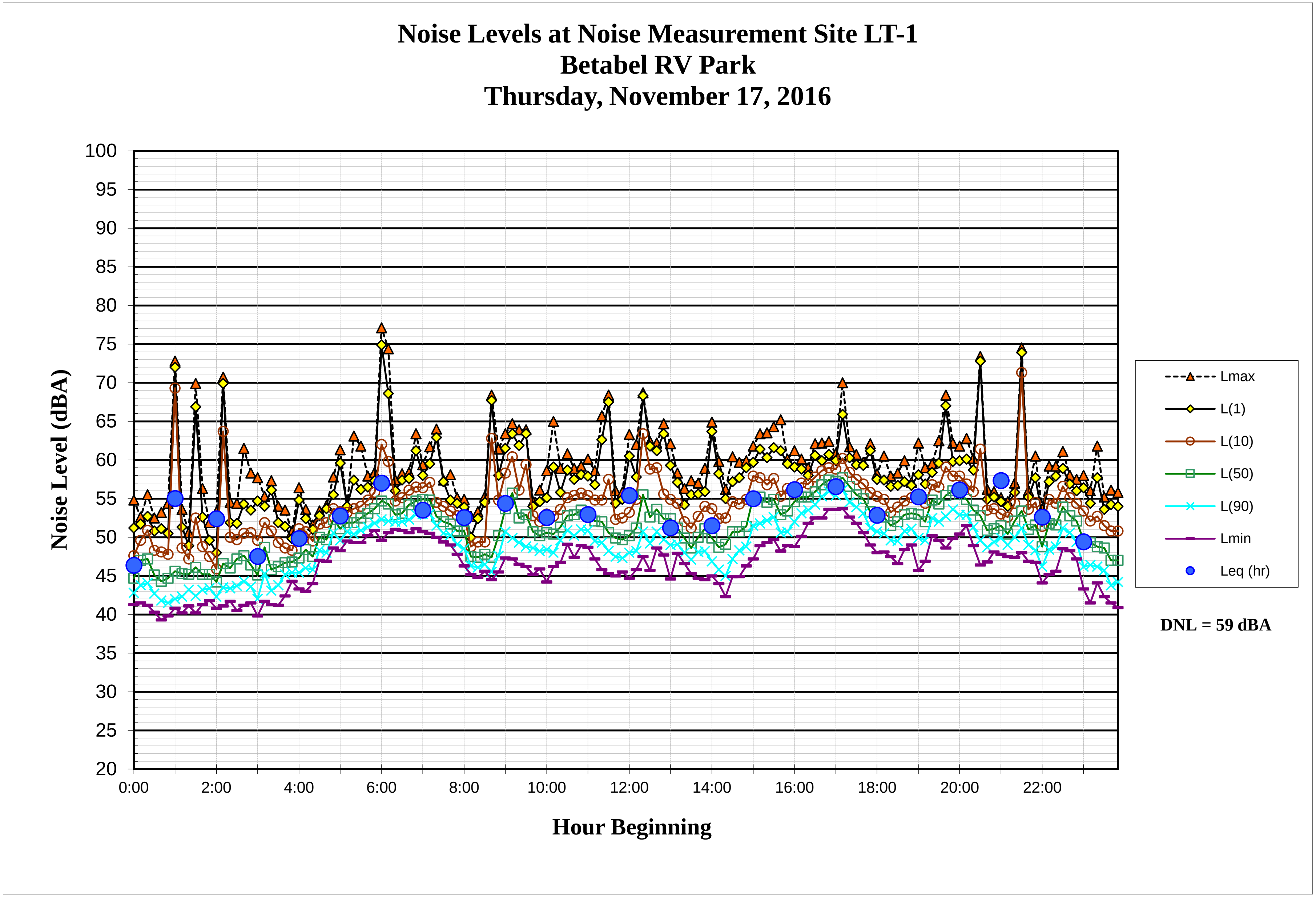
The project would generate a minor increase in traffic volumes along US 101 and SR 25. Project generated traffic would not measurably increase existing traffic noise levels (less than 1 dBA L_{dn}) at sensitive receptors along roadways serving the site. The project would cause a less than significant off-site traffic noise impact.

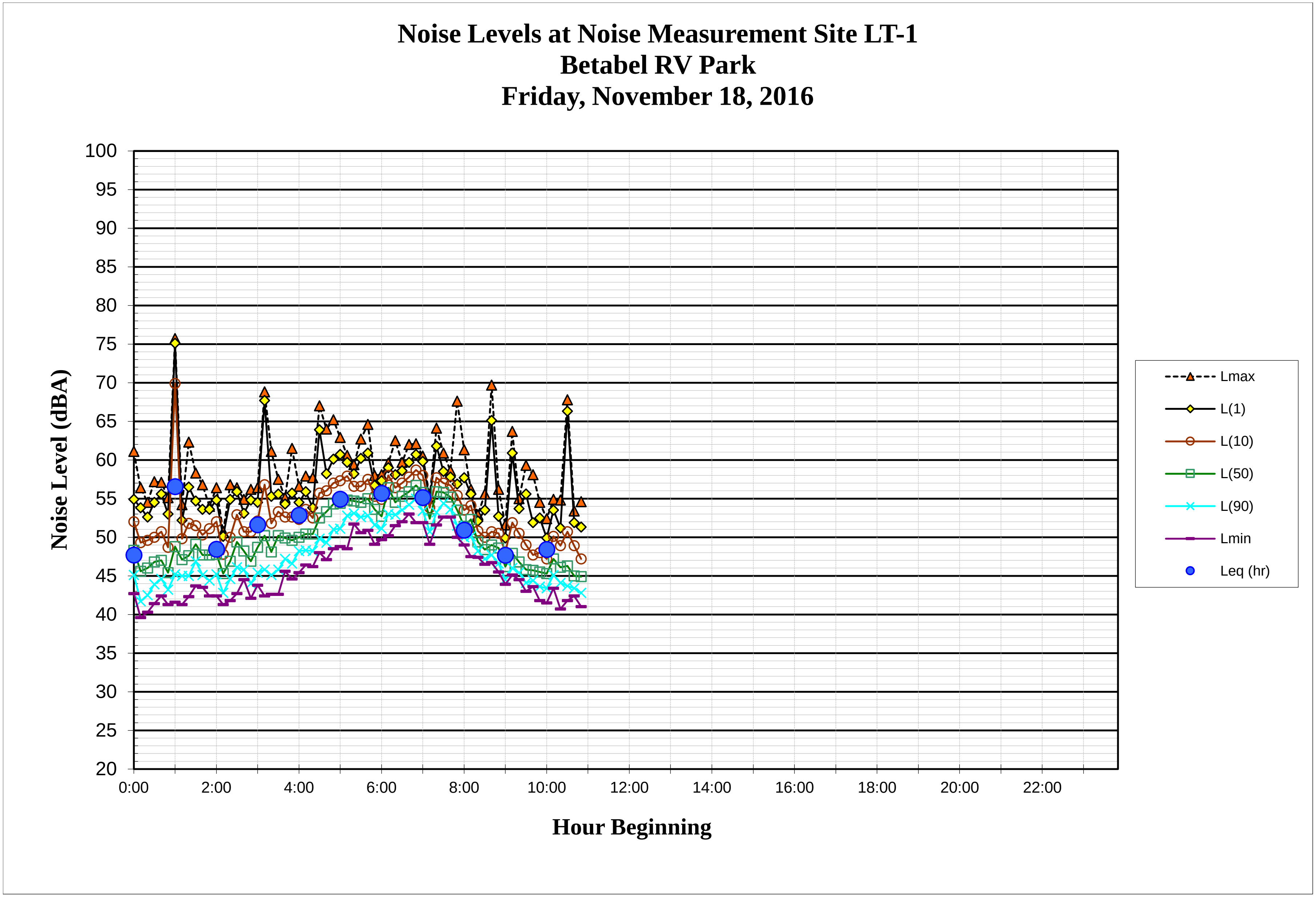
Mitigation: None required.

[3] Available at http://www.dot.ca.gov/trafficops/census/volumes2015/Route101.html

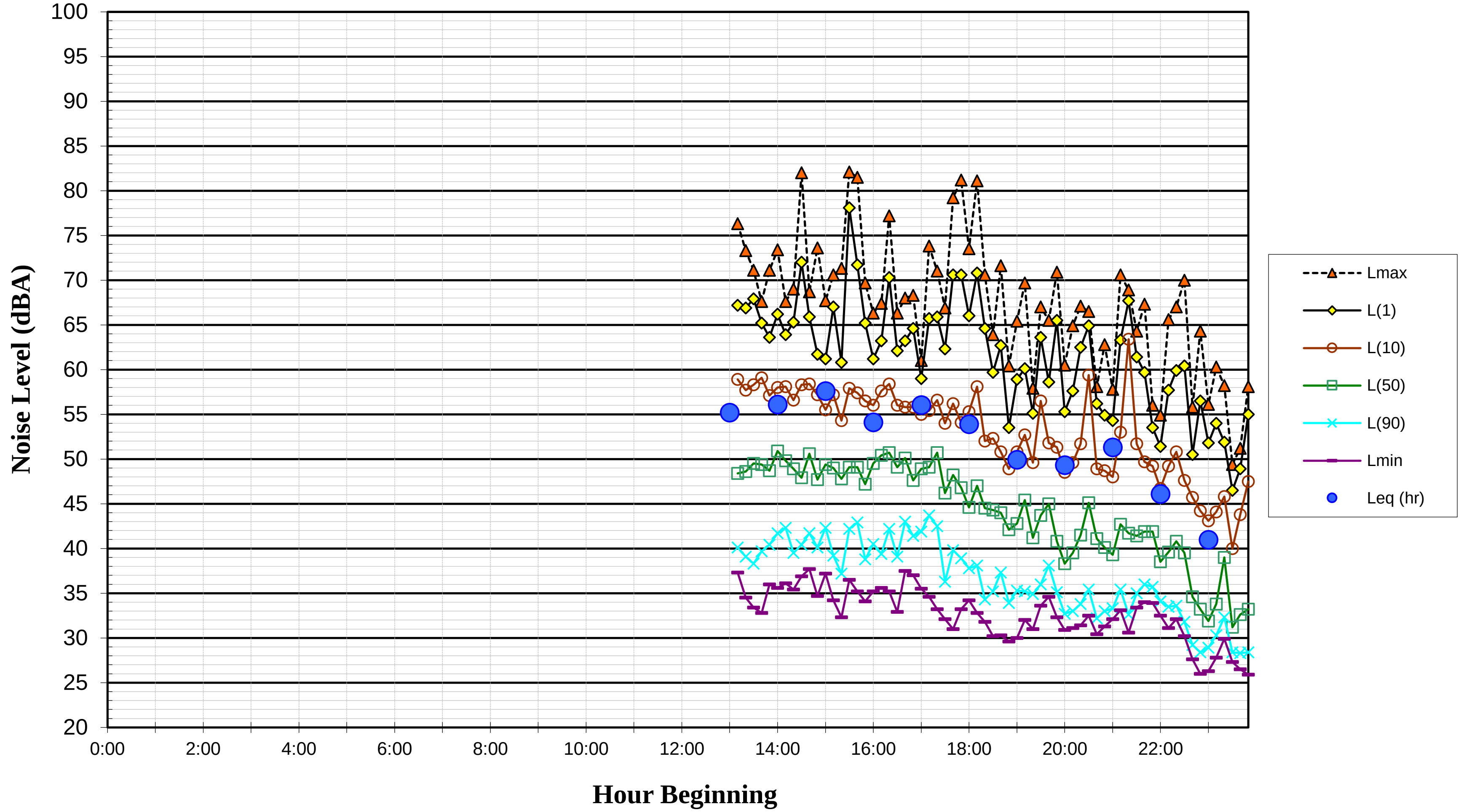


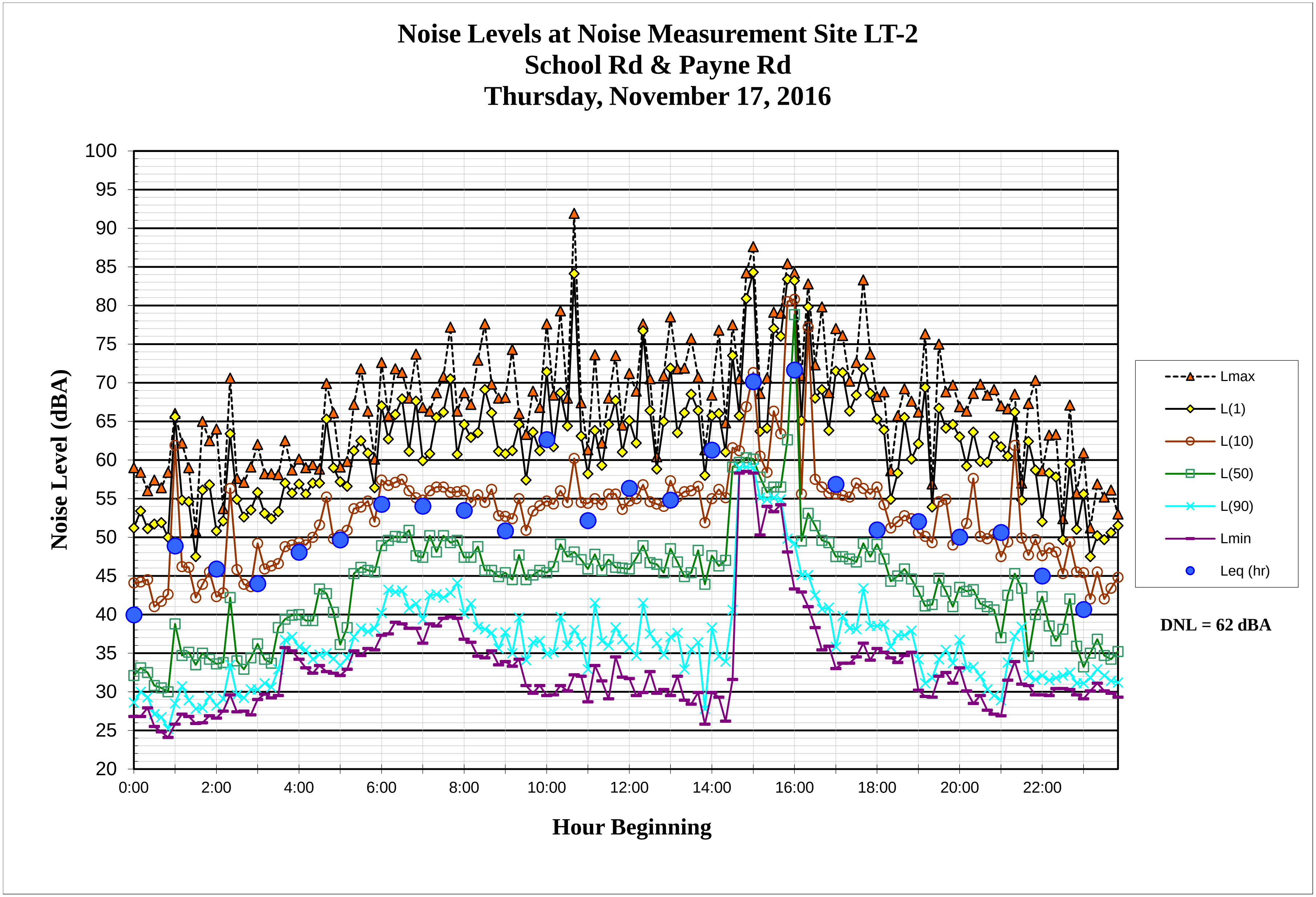
Noise Levels at Noise Measurement Site LT-1
Betabel RV Park
Wednesday, November 16, 2016
Noise Level (dBA)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)

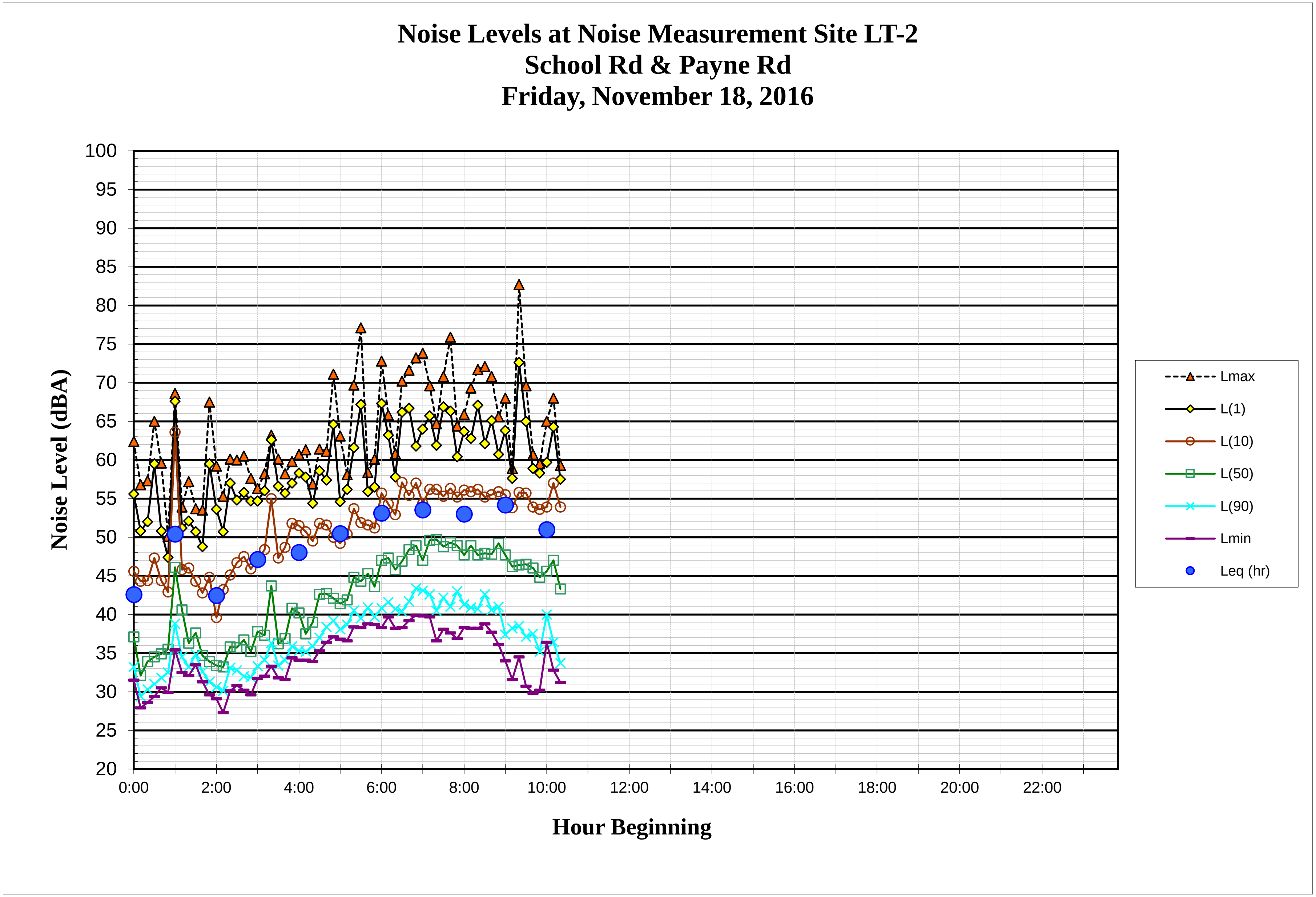

Noise Levels at Noise Measurement Site LT-1
Betabel RV Park
Thursday, November 17, 2016
Noise Level (dBA)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)
DNL = 59 dBA

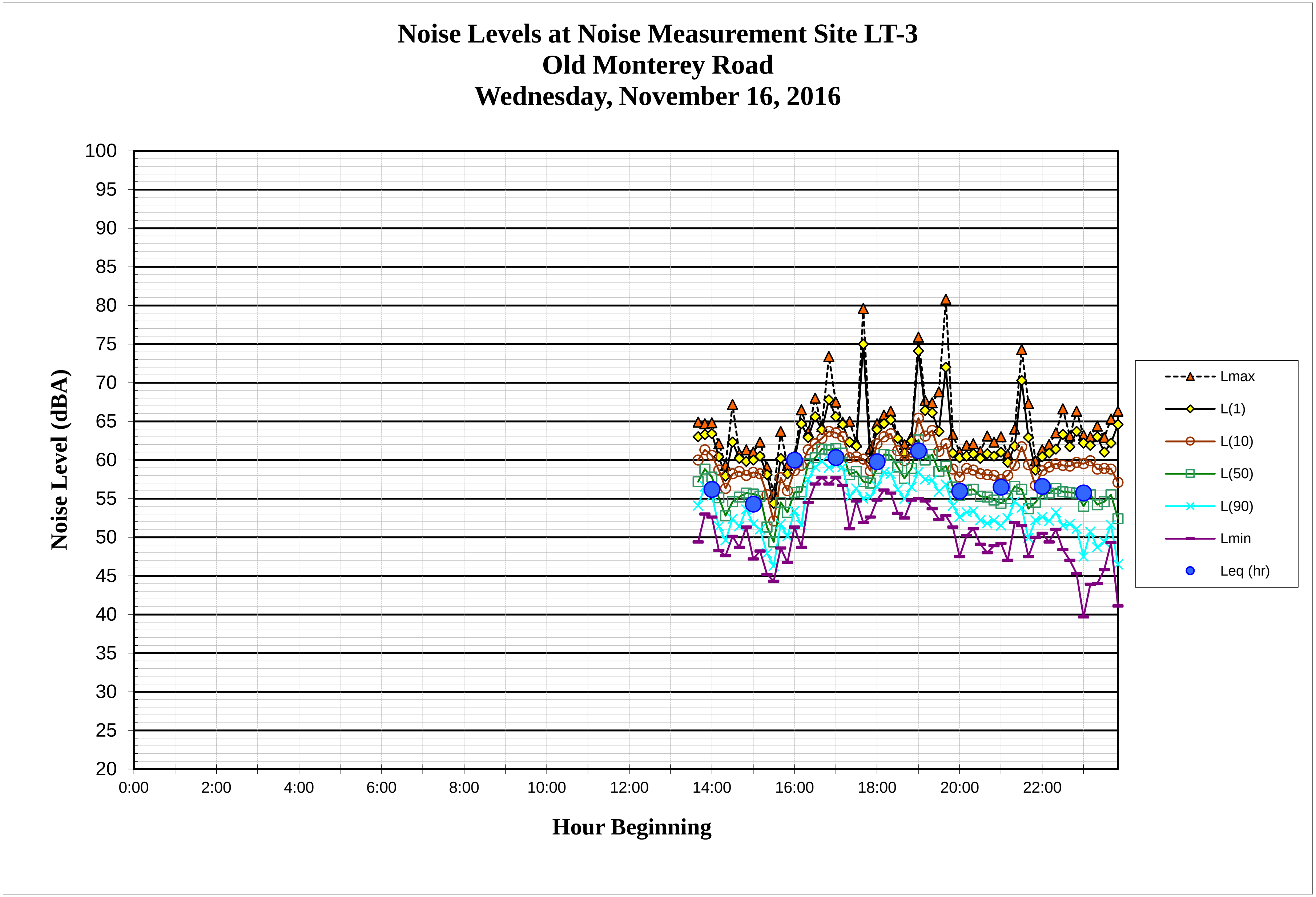

Noise Levels at Noise Measurement Site LT-1
Betabel RV Park
Friday, November 18, 2016
Noise Level (dBA)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)

Noise Levels at Noise Measurement Site LT-2
School Rd & Payne Rd
Wednesday, November 16, 2016

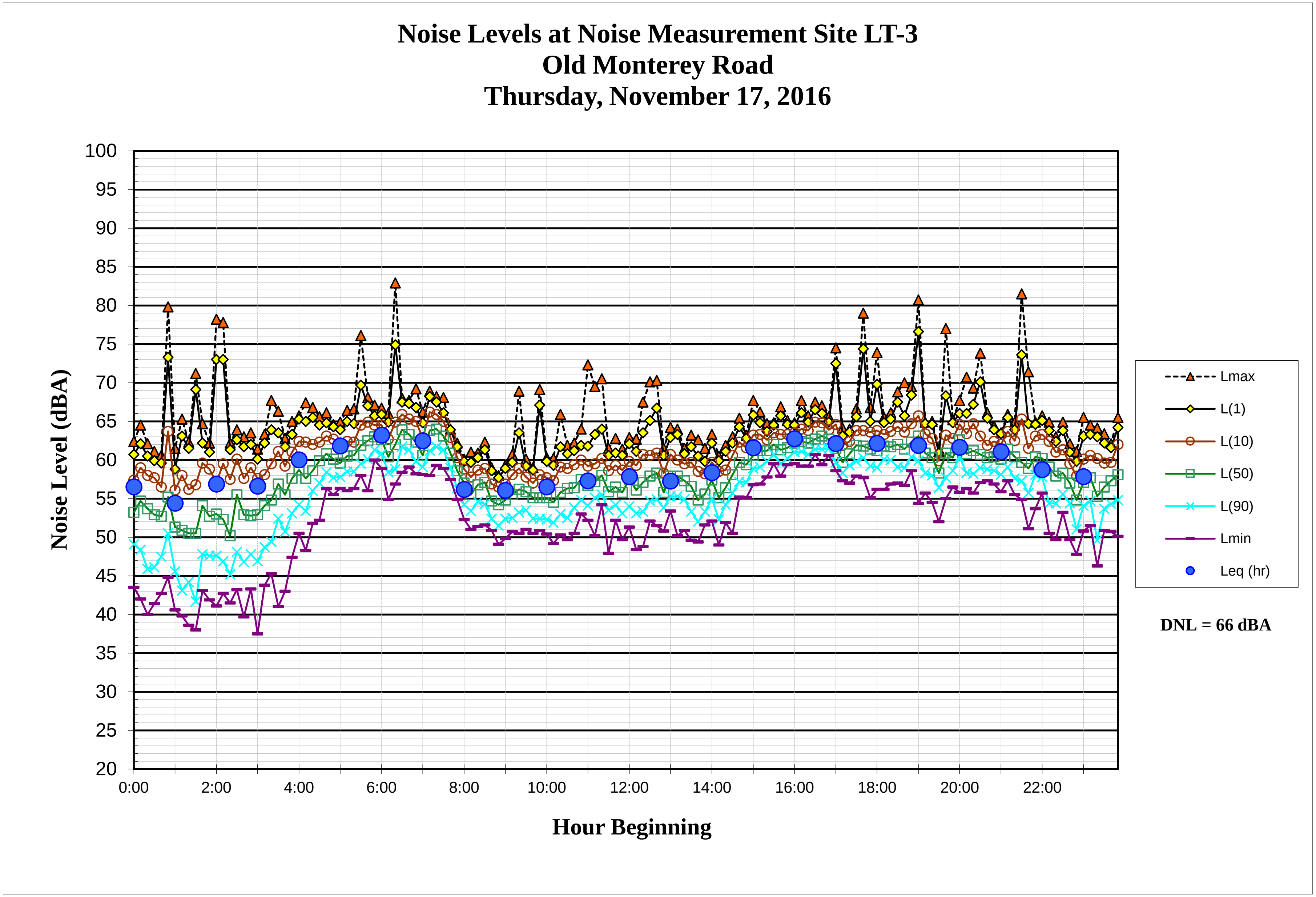


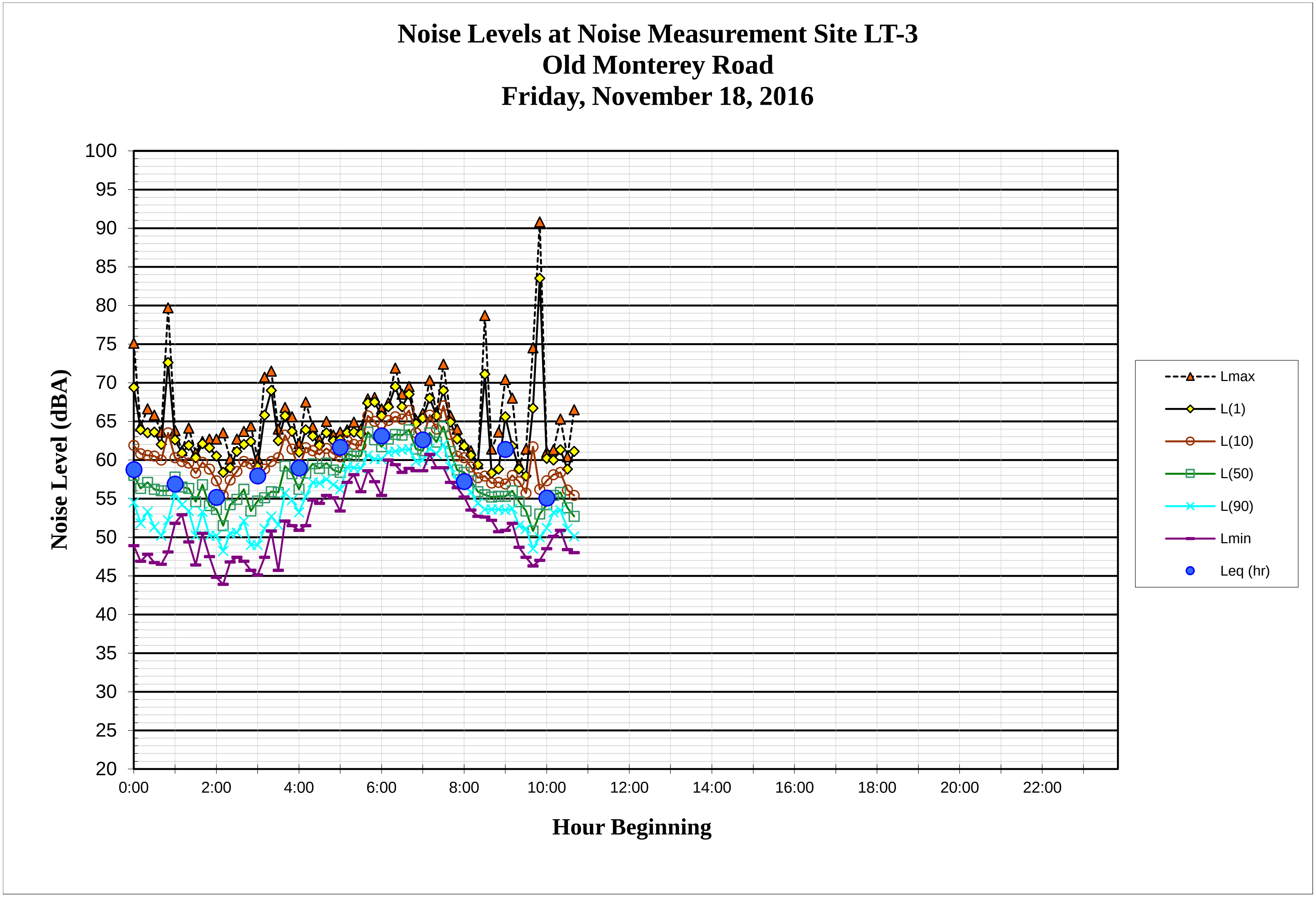

Noise Levels at Noise Measurement Site LT-2
School Rd & Payne Rd
Thursday, November 17, 2016
Noise Level (dBA)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)
DNL = 62 dBA


Noise Levels at Noise Measurement Site LT-2
School Rd & Payne Rd
Friday, November 18, 2016
Noise Level (dBA)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)



Noise Levels at Noise Measurement Site LT-3
Old Monterey Road
Wednesday, November 16, 2016
Noise Level (dBA)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)


Noise Levels at Noise Measurement Site LT-3
Old Monterey Road
Thursday, November 17, 2016
Noise Level (dBA)
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)
DNL = 66 dBA



Noise Levels at Noise Measurement Site LT-3
Old Monterey Road
Friday, November 18, 2016
Noise Level (dBA)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)

Appendix J.2

Noise Analysis of Rail Spur Alternative

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality
429 E. Cotati Avenue
Cotati, California 94931
Tel: 707-794-0400 *Fax: 707-794-0405*
www.illingworthrodkin.com *illro@illingworthrodkin.com*

MEMO

Date: **February 28, 2019**

To: **Amie Ashton, David J. Powers & Associates, Inc.**

From: **Dana M. Lodico, P.E., INCE Bd. Cert.**

Subject: **Noise Analysis of Rail Spur Alternative for Sargent Quarry, Santa Clara County, CA**

The Sargent Quarry Project is proposing a Rail Spur Alternative that would construct two new rail spurs along the southern end of the proposed processing plant area. Trains would travel the existing Union Pacific north-south rail line to the east adjacent to U.S. Highway 101 (US 101). The primary destination for the trains will be San José, with an occasional secondary stop at the Port of Redwood City. Both stops have existing quarry material unloading facilities and infrastructure to serve Sargent Quarry's needs. The majority of rail trips would occur at night.

The Rail Spur Alternative would reduce the need for customers in San José and the greater Bay Area to send trucks to pick up mined material at Sargent Quarry. As such, the quarry would allow shipping of approximately 1,600 tons of mined material per day northbound. These rail trips will replace the need for approximately 70 trucks per operating day to drive to the quarry, or approximately 10,518 truck trips per year. The maximum annual tonnage that could be shipped by rail and the number of truck trips that would be replaced annually are shown in Table 1.

Table 1: Rail Spur Trip, Material Summary, and Truck Trip Equivalent

Rail Spur Trips	Tons of Material Hauled	Truck Trips Replaced
Single train	1,600	70
Three Trains per week	4,800	210
Per month	20,160	882
Per year	241,920	10,518

An Environmental Noise Assessment[1] (ENA) was previously prepared to assess the operational and construction related noise impacts with respect to the California Environmental Quality Act (CEQA). The ENA discusses the results of the ambient noise monitoring survey completed to document existing noise conditions at receptors in the vicinity of the Sargent Quarry, describes the significance criteria

[1] Sargent Quarry Environmental Noise Assessment, Illingworth & Rodkin, Inc., February 9, 2017.

used to evaluate noise impacts attributable to the project, provides a discussion of each project impact, and presents mitigation measures, where necessary, to provide a compatible project in relation to sensitive land uses in the project vicinity. The purpose of this memo is to supplement the ENA with an assessment of the noise impacts related to the Rail Spur Alternative.

Consistent with the ENA, a substantial permanent noise increase would occur if the Rail Spur Alternative would increase existing noise levels at sensitive land uses by 3 dBA or greater in areas where existing with project noise levels exceed those considered normally acceptable for the land use (60 dBA L_{dn} for residential uses) or 5 dBA L_{dn} or greater in areas where existing with project noise levels would remain below those considered normally acceptable for the land use. Due to the length of the rail line and the variety of uses and noise environments located along it, the most conservative 3 dBA increase threshold is used for the assessment of train noise increases.

Reduction in Truck Trips Along the Roadway Network

As indicated in Table 1, the Rail Spur Alternative would replace the need for approximately 70 trucks per operating day and approximately 10,518 truck trips per year to drive to the quarry. As described in the ENA, the Project was anticipated to require up to 40 truck trips per hour between 7:00 am and 4:00 pm during peak operations, resulting in a total of 346 truck trips per day. With the Rail Spur Alternative, the number of daily truck trips would be reduced to 276.

Based on traffic volumes provided by Caltrans[2], US 101 currently (2017) has about 5,700 vehicle trips per peak hour and 68,000 vehicles daily with about 16.6% trucks, and SR 25 carries about 2,400 vehicles per peak hour and 29,500 vehicles daily with about 6.5% trucks.

As described in the ENA, the Project would generate a minor increase in traffic volumes along US 101 and SR 25, but would not measurably increase existing traffic noise levels (less than 1 dBA L_{dn}) at sensitive receptors along roadways serving the site. The Rail Spur Alternative would result a reduction of truck trips from the Project by about 20%. Although this reduction would result in a slight decrease in traffic noise levels from those anticipated with the Project, the difference between Project and Rail Spur Alternative traffic noise impacts would not be noticeable or measurable. Impacts resulting from Rail Spur Alternative traffic noise increases would be the same as those described for the Project. This is a **less-than-significant** impact.

Additional Train Trips Along the Rail Network

The Rail Spur Alternative would add approximately 3 trains per week along the existing Union Pacific north-south rail line to the east adjacent to US 101 (see Table 1). The majority of these trains would travel from the site to San José, with occasional trains continuing to Redwood City. Rail Spur Alternative train trips would primarily occur at night.

---

[2] Available at http://www.dot.ca.gov/trafficops/census/

Based on the Bay Area Regional Rail Plan,[3] the southern portion of the Union Pacific's Coast Subdivision currently carries an average of 10 passenger trains and 4 to 6 freight trains daily between San José and Gilroy and 2 passenger trains and 4 to 6 freight trains daily between Gilroy and Salinas. The Caltrain Corridor, which travels between San José and Redwood City currently carries an average of 96 weekday passenger trains and 4 freight trains daily. It is assumed that most of the passenger trains traveling between the site and San José would occur during daytime hours, with two northbound Caltrain trains departing the Gilroy station between 6:00 and 7:00 am. Between San José and Redwood City, approximately 96 weekday passenger trains travel the rail line between 4:30 am and 1:30 am. Information is not available on the timing of freight trains; however, previous I&R experience monitoring noise levels at sites along this rail line has indicated that existing freight train movements occur during daytime and nighttime hours.

Noise impacts from train movements were calculated through comparison of existing train movements to Existing Plus Rail Spur Alternative train movements. Due to the 10 dBA 'penalty' that is given to nighttime noise sources occurring between 10:00 pm and 7:00 am in the calculation of the L_{dn}, noise increases resulting from Rail Spur Alternative trains are dependent on the daytime/nighttime distribution of existing trains. Table 2 shows the noise increases that would result from the addition of one (1) nighttime train to existing operations, given a variety of daytime/nighttime distributions of existing freight and passenger trains.

Table 2: Noise Increases Attributable to 1 Additional Nighttime Freight Train Trip Per Day

Distribution of Existing Freight Trains		Distribution of Existing Passenger Trains: No Existing Passenger Trains	Distribution of Existing Passenger Trains: 10 Daytime Existing Passenger Trains	Distribution of Existing Passenger Trains: 96 Existing Passenger Trains (Daytime and Nighttime)
4 Freight Trains Per Day	4 Daytime, 0 Nighttime	**5 dBA**	**4 dBA**	1 dBA
	3 Daytime, 1 Nighttime	2 dBA	2 dBA	1 dBA
	2 Daytime, 2 Nighttime	2 dBA	2 dBA	1 dBA
	1 Daytime, 3 Nighttime	1 dBA	1 dBA	1 dBA
	0 Daytime, 4 Nighttime	1 dBA	1 dBA	1 dBA
6 Freight Trains Per Day	6 Daytime, 0 Nighttime	**4 dBA**	**4 dBA**	1 dBA
	5 Daytime, 1 Nighttime	2 dBA	2 dBA	1 dBA
	4 Daytime, 2 Nighttime	2 dBA	2 dBA	1 dBA
	3 Daytime, 3 Nighttime	1 dBA	1 dBA	1 dBA
	2 Daytime, 4 Nighttime	1 dBA	1 dBA	1 dBA
	1 Daytime, 5 Nighttime	1 dBA	1 dBA	1 dBA
	0 Daytime, 6 Nighttime	1 dBA	1 dBA	1 dBA

[3] Bay Area Regional Rail Plan, Technical Memorandum, Conditions, Configuration & Traffic on Existing System, November 2006.

As shown in Table 2, noise increases of more than 3 dBA would be anticipated in areas where existing operations do not currently include any nighttime train movements. Based on our experience, this is not currently the case anywhere along the train line. At least one existing nighttime freight train movement is highly likely to be occurring at all locations along the rail corridor. Assuming one or two existing nighttime freight train movements, noise increases of about 2 dBA L_{dn} would be anticipated. If three or more existing freight trains are traveling at night, increases of about 1 dBA would be anticipated.

Due to the large volume of existing passenger train movements traveling between San José and Redwood City, the addition of one nighttime freight train would result in train noise increases of 1 dBA L_{dn} or less on days when a Rail Spur Alternative train movement occurs along this portion of the line.

Train noise increases would be less than the 3 dBA criterion and would be considered **less-than-significant**.

(16-140)

Appendix J.3
Create Model Output

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project

Case: Sargent Quarry Rail Spur

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	41	16	35
Source 1	41	15	35
Source 2	0	0	0
Source 3	0	0	0
Source 4	0	0	0
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Commuter Diesel Locomotive	2				
Distance (source to receiver)	distance (ft)	5000				
Daytime Hours	speed (mph)	0				
(7 AM - 10 PM)	trains/hour	0				
	locos/train	0				
Nighttime Hours	speed (mph)	20				
(10 PM - 7 AM)	trains/hour	1				
	locos/train	1				
Wheel Flats?						
Jointed Track?	Y/N	Y				
Embedded Track?	Y/N	N				
Aerial Structure?	Y/N	N				
Barrier Present?	Y/N	N				

Appendix J.4

Traffic Noise Model

Sargent Quarry Roadway Noise Analysis

Existing

ROAD SEGMENT			TOTAL # VEHICLES	VEHICLE TYPE % Auto		MT		HT		VEHICLE SPEED Auto	k/h	MT	k/h	HT	k/h	NOISE LEVEL (dBA) Auto	MT	HT	CALCULATED NOISE LEVEL 15 meters from roadway center)
Calveno																			
Peak																			
	from:	to:		%	Auto	%	MT	%	HT										
US101	site	north	4140	92.5	3829.5	4	165.6	3.5	144.9	65	104	65	104	65	104	77.9	70.4	74.8	80.1
SR25	US101	Hollister	2396	93.5	2240.3	3	71.88	3.5	83.86	65	104	65	104	65	104	75.6	66.8	72.5	77.7

Assumptions: PM peak hour traffic data from Caltrans and Hexagaon

Existing + Project

ROAD SEGMENT			TOTAL # VEHICLES	VEHICLE TYPE % Auto		MT		HT		VEHICLE SPEED Auto	k/h	MT	k/h	HT	k/h	NOISE LEVEL (dBA) Auto	MT	HT	CALCULATED NOISE LEVEL 15 meters from roadway center)	
Calveno																				
Peak																				
	from:	to:		%	Auto	%	MT	%	HT											
US101	site	north	4180	92.5	3829.5	4	165.6	3.5	184.9	65	104	65	104	65	104	77.9	70.4	75.9	80.5	0.3
SR25	US101	Hollister	2404	93.5	2240.3	3	71.88	3.5	91.86	65	104	65	104	65	104	75.6	66.8	72.8	77.8	0.1

Cumulative

ROAD SEGMENT			TOTAL # VEHICLES	VEHICLE TYPE % Auto %	Auto	MT %	MT	HT %	HT	VEHICLE SPEED Auto	k/h	MT	k/h	HT	k/h	NOISE LEVEL (dBA) Auto	MT	HT	CALCULATED NOISE LEVEL (15 meters from roadway center)
Calveno Peak																			
	from:	to:																	
US101	site	north	5133.6	92.5	4748.58	4	205.344	3.5	179.676	65	104	65	104	65	104	78.8	71.4	75.8	81.1
SR25	US101	Hollister	2971.04	93.5	2777.922	3	89.1312	3	89.1312	65	104	65	104	65	104	76.5	67.7	72.7	78.4

Assumptions: PM peak hour traffic data from Caltrans and Hexagaon

Cumulaive + Project

ROAD SEGMENT			TOTAL # VEHICLES	VEHICLE TYPE % Auto %	Auto	MT %	MT	HT %	HT	VEHICLE SPEED Auto	k/h	MT	k/h	HT	k/h	NOISE LEVEL (dBA) Auto	MT	HT	CALCULATED NOISE LEVEL (15 meters from roadway center)
Calveno Peak																			
	from:	to:																	
US101	site	north	5201.6	92.5	4776.58	4	205.344	3.5	219.676	65	104	65	104	65	104	78.8	71.4	76.6	81.3
SR25	US101	Hollister	2985.04	93.5	2783.922	3	89.1312	3.5	97.1312	65	104	65	104	65	104	76.5	67.7	73.1	78.5

Note: Per Transportation study page 92, cumulative scenario is 24%greater than existing