Technical Memorandum

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Date: July 6, 2022

Re: Adelanto TTM 20486: SFR 166 – Noise Assessment

1.0 Purpose

The purpose of this memorandum is to document the impacts of construction, mobile, and operational noise as it relates to the potential environmental impacts associated with the construction and operation of the proposed 166 lot residential project on 39.53 acres.

2.0 Project Location & Description

2.1 Project Location: The proposed project site is located in the City of Adelanto, San Bernardino, California on the north side of Cactus Road, west of Daisy Road, and east of Aster Road, and is referred to as APN: 0459-132-34-000.

2.2 Description: The Applicant is proposing a tentative tract map to subdivide approximately 39.53 acres into 166 single-family residential lots with a minimum lot size of 5,000 square feet.

3.0 Noise Impacts

3.1 Ambient Noise: The Project site is in partially developed area of the City and currently does not generate noise. The existing noise environment in the Project area is characterized by the area's general level of development. The Project is located in a partially developed with residential uses. Ambient noise levels are therefore increased as a result of roadway traffic, industrial activities, and other human activities. Table 3.1, *Population Density and Associated Ambient Noise Levels,* summarizes typical ambient noise levels based on level of development. Given the rural nature of the proposed Project area, baseline ambient noise levels are assumed to be approximately 40-50 Ldn.

Table 3.1. Population Density and Associated Ambient Noise Levels

Population Density	dBA, Ldn
Rural 40-50	40-50
Small town or quite suburban residential	50
Normal suburban residential	55
Urban residential	60
Noisy urban residential	65
Very noisy urban residential	70
Downtown, major metropolis	75-80
Area adjoining freeway or near major airport	80–90
Notes: dBA = A-weighed decibels Ldn = day-night level	

Source: Draft Initial Study / Mitigated Negative Declaration Silver Peak Solar Project, February 24, 2022

3.2 Construction Noise: Construction activities that would create noise include: site preparation, grading, building construction, paving, and architectural coating. Noise levels associated with the construction will vary with the different types of construction equipment, the duration of the activity, and distance from the source. Construction noise will have a temporary or periodic increase in the ambient noise level above the existing levels within the Project vicinity. The nearest sensitive receptor to the Project site is the Adelanto High School, located 1,870 feet west of the property western boundary. To estimate the potential impact of construction noise at the Adelanto High School, equipment that is expected to be used during construction was input into the Federal Highway Administration Roadway Construction Noise Model (RCNM) to generate anticipated noise levels. The RCNM generates the maximum noise levels (Lmax) and the equivalent continuous sound level (Leq). The Leq is a calculation of the anticipated steady sound pressure level which, over a given time period (day, evening, night) has the same total energy as the actual fluctuating noise. The RCNM also uses an acoustical use factor in the noise calculations. The acoustical use factor is the percentage of time each piece of construction equipment is assumed to be operating at the full power level and is used to estimate the Leq values from the Lmax values. For example, typical operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Noise levels will be loudest during the site preparation and grading phases. Table 3.2, *Construction Equipment Noise Levels at the Nearest Receptor,* identifies the level of noise generated by construction equipment.

Table 3.2 Construction Equipment Noise Levels at the Nearest Receptor

Source	Approximate Distance to Nearest Receptor [1] (Property Line to Construction Site) (feet)	Sound Level at Nearest Receptor		
		Lmax	Acoustical Use Factor (%)	Leq
Backhoe	1,870	46.1	40	42.1
Compactor (ground)	1,870	51.8	20	44.8
Compressor (air)	1,870	46.2	40	42.2
Crane	1,870	49.1	16	41.1
Compactor (ground)	1,870	51.8	20	44.8
Concrete Mixer Truck	1,870	47.3	40	43.4
Dozer	1,870	50.2	40	46.2
Dump Truck	1,870	45.0	40	41.0
Excavator	1,870	49.3	40	45.3
Front End Loader	1,870	47.7	40	43.7
Generator	1,870	49.2	50	46.2
Grader	1,870	53.5	40	49.6
Offroad Forklift	1,870	51.9	40	48.0
Paver	1,870	45.8	50	42.8
Pickup Truck	1,870	43.5	40	39.6
Roller	1,870	48.5	20	41.6
Scraper	1,870	52.1	40	48.1

Welder Torch	1,870	42.5	40	38.6

1. Nearest Receptor – Adelanto High School.
   Source: FHWA – RCNM Version 1.1

The properties immediately adjacent and surrounding the Project site are vacant undeveloped parcels additionally, the nearest sensitive receptors are located over ¼ mile away and the Project would be compatible with surrounding land uses and would not adversely impact sensitive receptors.

The City of Adelanto has set restrictions to control noise impacts from construction activities. Section 17.90.020(d)(1) of the Adelanto Municipal Code restricts construction activities between the hours of 7:00 AM to dusk on weekdays, and construction will not occur on weekends or state holidays.

Noise generation related to construction activities is addressed in §17.90.020(d) of the Zoning Ordinance which requires construction projects to list general noise reduction practices as "General Notes" on the construction drawings as part of the Project's conditions of approval (COA). These mandatory conditions are described as follows:

17.90.020 (d) Construction Practices
To reduce potential noise and air quality nuisances, the following items shall be listed as "General Notes" on the construction drawings:

(1) Construction activity and equipment maintenance is limited to the hours between 7:00 a.m. to dusk on weekdays. Construction may not occur on weekends or State holidays, without prior consent of the Building Official. Non-noise generating activities (e.g., interior painting) are not subject to these restrictions. City and State construction projects, such as road re-building or resurfacing, and any construction activity that is in response to an emergency, shall be exempt from this requirement.

(2) Stationary construction equipment that generates noise in excess of sixty-five (65) dBA at the project boundaries must be acoustically shielded and located at least one hundred feet (100') from occupied residences. The equipment area with appropriate acoustic shielding shall be designated on building and grading plans. Equipment and shielding shall remain in the designated location throughout construction activities.

(3) Construction routes are limited to City of Adelanto designated truck routes.

(4) Water trucks or sprinkler systems shall be used during clearing, grading, earth moving, excavation, or transportation of cut or fill materials to prevent dust from leaving the site and to create a crust after each day's activities cease. At a minimum, this would include wetting down such areas in the later morning and after work is completed for the day and whenever wind exceeds fifteen (15) miles per hour.

(5) A person or persons shall be designated to monitor the dust control program and to order increased watering as necessary to prevent transport of dust off-site. The name and telephone number of such person(s) shall be provided to the City.

(6) All grading equipment shall be kept in good working order per factory specifications.

With implementation of the above standard conditions of approval, construction noise impacts would be less than significant.

While the City establishes limits to the hours during which construction activity may take place, it does not identify specific noise level limits for construction noise levels. Therefore, to evaluate whether the Project will generate a substantial increase in the short-term noise levels at the offsite sensitive receptors (residences), the construction-related noise level threshold is based on the National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit (REL) for occupation noise exposure at 85 dBA, as an 8-hour time-weighted average (85 dBA – 8-hr TWA).

The highest equipment noise level at the nearest sensitive receptor as indicated in Table 3.2 will be at 53.5 dBA (Lmax) and 49.6 dBA (LEQ). During the construction phase the noise levels will be the highest as heavy equipment pass along the Project site boundaries. During the site preparation and grading phases equipment will not be stationary, rather equipment will be moving throughout the site and varying speeds and power levels and as a result not operating at the maximum noise level for the entire work day. The levels of noise at the nearest receptor as indicated in Table 3.2 are all below the NIOSH REL of 85 dBA 8-hour TWA, and would be less than significant. Construction noise is of short-term duration and will not present any long-term impacts on the project site or the surrounding area.

3.3 Operational Noise:

3.3.1 Offsite Traffic Noise Impacts.

Vehicle noise is a combination of the noises produced by the engine, exhaust, and tires. The primary source of noise generated by the Project will be from the vehicle traffic generated by the vehicle ingress and egress to the Project site. Under existing conditions, the site does not generate any traffic noise that impacts the surrounding area.

According to the Federal Highway Administration*, Highway Traffic Noise Analysis and Abatement Policy and Guidance.* the level of roadway traffic noise depends on three things: (l) the volume of the traffic, (2) the speed of the traffic, and (3) the number of trucks in the flow of the traffic. Generally, the loudness of traffic noise is increased by heavier traffic volumes, higher speeds, and greater numbers of trucks. These factors are discussed below.

- *The Volume of the Traffic*

Upon buildout, the proposed Project is expected to generate approximately 1,565 average daily vehicle trips[1], which will increase the ambient traffic noise levels in the vicinity of the Project site in comparison to the existing site conditions.

The primary transportation routes for the Project site will be Mojave Drive as it provides paved access to Highway 395 and Aster Road which provides access to both Mojave Drive and Palmdale Road (State Route 18). Traffic from the site would also utilize Cactus Road, which intersects with Bellflower Road to the east.

Estimated traffic conditions for the roadways are presented in Table 3.3.

Table 3.3 Estimated Traffic Roadway Conditions

Roadway	Number of Lanes	ADT	With Project Traffic
Mojave Drive	4	9,589 (1)	11,116
Palmdale (SR18)	4	22,939	24,466
Aster Road	4	17,500 (2)	19,027
Cactus Road	2	6,800 (3)	8,327

Sources: Environmental Impact Report Volume 1 Adelanto North 2035 Comprehensive Sustainable Plan, March 2014 Table 4.16-1.
Adelanto Switching Station Expansion Project Initial Study, Mitigated Negative Declaration, February 2021.

(1) Assumes ½ of traffic on Mojave Drive east of 395 travels west on Mojave Drive.
(2) Table 4.16-1 Arterial/Highway Daily Volume Threshold.
(3) Table 4.16-2 Collector Daily Volume Threshold.

The Traffic Impact Study for the Project conducted by RK Engineering Group, Inc. dated April 6, 2022 included traffic trip generation from cumulative projects. The cumulative projects in the area traffic volumes total an additional 3,458 ADT, whereas the Project is 1,565 ADT and would increase the total traffic by approximately 45%.

Table 3.4 Cumulative Plus Project ADT

Cumulative Area ADT	Project ADT	Cumulative Plus Project ADT	Percent Change
3,458	1,565	5,023	45% Increase

Additionally, the traffic Impact Study calculated the Project's impact on AM and PM traffic conditions at the nearest major intersections with comparisons to existing traffic conditions, project traffic, and cumulative project impacts. The results are presented in Table 3.5.

[1] Institute of traffic Engineers (ITE) Code 210 Single Family Detached Housing 9.6 ADT/dwelling unit.

Table 3.5 Major Intersections Cumulative and Project Traffic Conditions

Intersection	Existing Peak Hour Conditions	Cumulative w/Project Conditions	Growth in Traffic	Project Traffic
Aster Road /Mojave Drive	1,536	1,657	121	59
Bellflower Street / Mojave Drive	1,595	1,780	185	88

According to Caltrans, the human ear is able to begin to detect sound level increases of 3 decibels (dB) in typical noisy environments.[2] A doubling of sound energy (e.g., doubling the volume of traffic on a highway) that would result in a 3-dBA increase in sound, would generally be barely detectable. As indicated in Table 3.3 through 3.5 implementation of the Project will increase traffic volumes in the area but not to the extent that traffic volumes will be doubled creating a +3dBA noise increase or result in a perceivable noise increase. Therefore, operational noise impacts would be less than significant.

- *The Speed of Traffic*

The speed limit of the roadways around the project site are subject to a prima facie limit of 25 mph under the vehicle code. These low levels of speeds do not result in vehicles generating high levels of noise.

- *The Number of Trucks in the Flow of the Traffic*

The Project is a residential development and it will not routinely generate noise from large trucks.

3.3.2 Residential Activities

Typical operational sound levels generated by single-family residential activities include normal outdoor conversations, air conditioner units, and lawn care equipment with levels as indicated below:

- Normal conversation, air conditioner - 60 dBA
- Gas-powered lawnmowers and leaf blowers – 80 to 85 dBA.[3]

Noise generated from air conditioners and lawn care equipment are not at constant and consistent levels throughout the day. Lawn care is performed during daylight hours for short durations and although air conditioners are operating both day and night they are cycling on/off with windows closed conditions. As indicated in Section 3.2 of this memorandum noise levels would be attenuated as with mobile noise sources with standard building construction and windows closed by approximately 25 dBA.

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[2] Caltrans, Traffic Noise Analysis Protocol, April 2020, p.7-1.

[3] Center for Disease Control, "*Loud Noised Can Cause Hearing Loss*". ,https://www.cdc.gov/nceh/hearing_loss/default.html, accessed on November 11, 2021.

The USEPA identifies noise levels affecting health and welfare as exposure levels over 70 dBA over a 24-hour period. Noise levels for various levels are identified according to the use of the area. Levels of 45 dbA are associated with indoor residential areas, hospitals, and schools, whereas 55 dBA is identified for outdoor areas where typical residential human activity takes place. According to the USEPA levels of 55 dbA outdoors and 45 dbA indoors are identified as levels of noise considered to permit spoken conversation and other activities such as sleeping, working, and recreation, which are part of the daily human condition.[4] Levels exceeding 55 dbA in a residential setting are normally short in duration and not significant in affecting health and welfare of residents.

3.4 Vibration

During construction the operation and movement of heavy equipment create seismic waves that radiate along the ground-surface in all directions. These waves are felt as ground vibrations. Vibrations from construction can result in effects ranging from annoyance to people to structure damage. Vibration levels are impacted by geology, distance, and frequencies. According to the Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018[37], while ground vibrations from construction activities do not often reach the levels that can damage structures, construction vibration may result in building damage or prolonged annoyance from activities such as blasting, piledriving, vibratory compaction, demolition, and drilling or excavation near sensitive structures. The Project does not require these types of construction activities.

Vibration amplitude and impact decreases with distance and perceptible goundborne vibration is generally limited to areas within one to two hundred feet of the construction activity.

The vibration standard used for the City is that no ground vibration shall be allowed that can be felt without the aid of instruments at or beyond the subject property line, nor will any vibration be permitted that produces a particle velocity greater than or equal to two-tenths of an inch per second measured at or beyond the lot line.

Table 3.6 Vibration Source Levels for Construction Equipment

Equipment	PPV (in/sec) at 25 feet
Small bulldozer	0.003
Jackhammer	0.035
Loaded Trucks	0.076
Large bulldozer	0.089

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment, September 2018.

The closest sensitive receptor to the Project property line is minimally 1,870 feet from the property line. The estimated construction vibration level from a large bulldozer (worst case

[4] USEPA "EPA Identifies Noise Levels Affecting Health and Welfare" https://archive.epa.gov/epa/aboutepa/epa-identifies-noise-levels-affecting-health-and-welfare.html accessed November 11, 2021.

[37] https://www.transit.dot.gov/research-innovation/transit-noise-and-vibration-impact-assessment-manual-report-0123.

scenario) measured at 15-feet would create a vibration level of 0.191 in/sec which does not exceed the 0.2 in/sec threshold. Therefore, the vibrations at the nearest sensitive receptor will remain well below the strongly perceptible annoyance criteria and potential residential vibration damage criteria thresholds listed in the City of Adelanto Municipal Code Section 17.90.030 (vibration). This threshold requires that no vibration greater than 0.2 PPV be felt at or beyond the lot line. The proposed Project therefore is not considered to result in exposure of people to excessive ground vibration.

During operations of the Project following construction the primary source of vibration would be from vehicle traffic. Ground-borne vibration levels from automobile traffic are generally overshadowed by vibration generated by heavy trucks that roll over the same uneven roadway surfaces. However, due to the rapid drop-off rate of ground-borne vibration and the short duration of the associated events, vehicular traffic-induced ground-borne vibration is rarely perceptible beyond the roadway right-of-way, and rarely results in vibration levels that would cause annoyance to people or damage to buildings in the vicinity.

4.0 Conclusion

Based on the assessment in Section 3.0 through compliance with mandatory City requirements and ordinances to reduce noise during construction, the Project's construction noise impacts will not result in the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project. In addition, the Project's operational noise would be less than significant for mobile and operational noise and as such impacts to the environment for Noise are less than significant.

Appendix A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 07/04/2022
Case Description: TTM20486

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Adelanto High School	Commercial	62.0	60.0	50.0

Equipment Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	1870.0	0.0
Dozer	No	40		81.7	1870.0	0.0
Scraper	No	40		83.6	1870.0	0.0
Excavator	No	40		80.7	1870.0	0.0
Grader	No	40	85.0		1870.0	0.0
Scraper	No	40		83.6	1870.0	0.0
Crane	No	16		80.6	1870.0	0.0
Gradall	No	40		83.4	1870.0	0.0
Generator	No	50		80.6	1870.0	0.0
Welder / Torch	No	40		74.0	1870.0	0.0
Compressor (air)	No	40		77.7	1870.0	0.0
Paver	No	50		77.2	1870.0	0.0
Roller	No	20		80.0	1870.0	0.0
Pickup Truck	No	40		75.0	1870.0	

0.0
Compactor (ground) No 20 83.2 1870.0
0.0
Concrete Mixer Truck No 40 78.8 1870.0
0.0
Dump Truck No 40 76.5 1870.0
0.0
Front End Loader No 40 79.1 1870.0
0.0

Results

Noise Limits (dBA) Noise Limit Exceedance (dBA)

Calculated (dBA) Day Evening Night

Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	46.1	42.1	N/A	65.0	N/A	65.0	N/A	N/A
Dozer	50.2	46.2	N/A	65.0	N/A	65.0	N/A	N/A
Scraper	52.1	48.1	N/A	65.0	N/A	65.0	N/A	N/A
Excavator	49.3	45.3	N/A	65.0	N/A	65.0	N/A	N/A
Grader	53.5	49.6	N/A	65.0	N/A	65.0	N/A	N/A
Scraper	52.1	48.1	N/A	65.0	N/A	65.0	N/A	N/A
Crane	49.1	41.1	N/A	65.0	N/A	65.0	N/A	N/A
Gradall	51.9	48.0	N/A	65.0	N/A	65.0	N/A	N/A
Generator	49.2	46.2	N/A	65.0	N/A	65.0	N/A	N/A
Welder / Torch	42.5	38.6	N/A	65.0	N/A	65.0	N/A	N/A
Compressor (air)	46.2	42.2	N/A	65.0	N/A	65.0	N/A	N/A
Paver	45.8	42.8	N/A	65.0	N/A	65.0	N/A	N/A

65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Roller			48.5	41.6	N/A	65.0	N/A	
65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Pickup Truck			43.5	39.6	N/A	65.0	N/A	
65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Compactor (ground)			51.8	44.8	N/A	65.0	N/A	
65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Concrete Mixer Truck			47.3	43.4	N/A	65.0	N/A	
65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Dump Truck			45.0	41.0	N/A	65.0	N/A	
65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
Front End Loader			47.7	43.7	N/A	65.0	N/A	
65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A
		Total	53.5	57.7	N/A	65.0	N/A	
65.0	N/A	N/A	N/A	None	N/A	None	N/A	N/A

**** Receptor #2 ****

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
South Residential	Residential	62.0	60.0	50.0

			Equipment				
			Spec	Actual	Receptor	Estimated	
	Impact	Usage	Lmax	Lmax	Distance	Shielding	
Description	Device	(%)	(dBA)	(dBA)	(feet)	(dBA)	
Backhoe	No	40		77.6	2800.0	0.0	
Dozer	No	40		81.7	2800.0	0.0	
Scraper	No	40		83.6	2800.0	0.0	
Excavator	No	40		80.7	2800.0	0.0	
Grader	No	40	85.0		2800.0	0.0	
Scraper	No	40		83.6	2800.0	0.0	
Crane	No	16		80.6	2800.0	0.0	
Gradall	No	40		83.4	2800.0	0.0	
Generator	No	50		80.6	2800.0		

0.0				
Welder / Torch	No	40	74.0	2800.0
0.0				
Compressor (air)	No	40	77.7	2800.0
0.0				
Paver	No	50	77.2	2800.0
0.0				
Roller	No	20	80.0	2800.0
0.0				
Pickup Truck	No	40	75.0	2800.0
0.0				
Compactor (ground)	No	20	83.2	2800.0
0.0				
Concrete Mixer Truck	No	40	78.8	2800.0
0.0				
Dump Truck	No	40	76.5	2800.0
0.0				
Front End Loader	No	40	79.1	2800.0
0.0				

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

	Calculated (dBA)									
Equipment	Day		Evening		Night		Day		Evening	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	42.6	38.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	46.7	42.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	48.6	44.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	45.7	41.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	50.0	46.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	48.6	44.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	45.6	37.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall			48.4	44.5	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator			45.7	42.7	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch			39.0	35.1	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compressor (air)			42.7	38.7	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver			42.3	39.2	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller			45.0	38.0	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck			40.0	36.1	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compactor (ground)			48.3	41.3	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck			43.8	39.9	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck			41.5	37.5	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader			44.1	40.2	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Total	50.0	54.2	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #3 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Donald E. Bradach Elem School	Commercial	62.0	60.0	50.0

Description	Impact Device	Usage (%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	3550.0	0.0
Dozer	No	40		81.7	3550.0	0.0

Scraper	No	40		83.6	3550.0
0.0					
Excavator	No	40		80.7	3550.0
0.0					
Grader	No	40	85.0		3550.0
0.0					
Scraper	No	40		83.6	3550.0
0.0					
Crane	No	16		80.6	3550.0
0.0					
Gradall	No	40		83.4	3550.0
0.0					
Generator	No	50		80.6	3550.0
0.0					
Welder / Torch	No	40		74.0	3550.0
0.0					
Compressor (air)	No	40		77.7	3550.0
0.0					
Paver	No	50		77.2	3550.0
0.0					
Roller	No	20		80.0	3550.0
0.0					
Pickup Truck	No	40		75.0	3550.0
0.0					
Compactor (ground)	No	20		83.2	3550.0
0.0					
Concrete Mixer Truck	No	40		78.8	3550.0
0.0					
Dump Truck	No	40		76.5	3550.0
0.0					
Front End Loader	No	40		79.1	3550.0
0.0					

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Calculated (dBA)

Day Evening Night

Day Evening Night

Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq

Backhoe			40.5	36.6	N/A	N/A	N/A		
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Dozer			44.6	40.7	N/A	N/A	N/A		
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Scraper			46.6	42.6	N/A	N/A	N/A		
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Excavator			43.7	39.7	N/A	N/A	N/A		
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Grader			48.0	44.0	N/A	N/A	N/A		
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Scraper			46.6	42.6	N/A	N/A	N/A		
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Crane			43.5	35.6	N/A	N/A	N/A		
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Gradall			46.4	42.4	N/A	N/A	N/A		
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Generator			43.6	40.6	N/A	N/A	N/A		
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Welder / Torch			37.0	33.0	N/A	N/A	N/A		
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Compressor (air)			40.6	36.7	N/A	N/A	N/A		
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Paver			40.2	37.2	N/A	N/A	N/A		
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Roller			43.0	36.0	N/A	N/A	N/A		
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Pickup Truck			38.0	34.0	N/A	N/A	N/A		
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Compactor (ground)			46.2	39.2	N/A	N/A	N/A		
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Concrete Mixer Truck			41.8	37.8	N/A	N/A	N/A		
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Dump Truck			39.4	35.4	N/A	N/A	N/A		
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Front End Loader			42.1	38.1	N/A	N/A	N/A		
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
		Total	48.0	52.1	N/A	N/A	N/A		
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	